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Extract from the Political Code.

SECTION 2296. Books may be taken from the Library by the MEMBERS OF THE LEGISLATURE, DURING THE SESSIONS THEREOF, and by other State officers at any time.

SEC. 2298. The Controller, if notified by the Librarian that any officer has failed to return books taken by him within the time prescribed by the Rules, and after demand made, must not draw his warrant for the salary of such officer until the return is made, or three times the value of the books, or of any injuries thereto, has been paid to the Librarian.

SEC. 2299. Every person who injures or fails to return any book taken is liable to the Librarian in three times the value thereof.

No person shall take or detain from the General Library more than two volumes at any one time, or for a longer period than two weeks. BOOKS OF REFERENCE SHALL NOT BE TAKEN FROM THE LIBRARY AT ANY TIME.—[Extract from the Rules.

☞The foregoing Regulations will be strictly enforced.☜

Jul. 1970

MINING AND SCIENTIFIC PRESS.

INV. 1898.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JANUARY 3, 1880.

VOLUME XL Number 1.

Mining Companies Should Hold Reserves.

It is essentially necessary that mining companies should hold back a portion of their earnings, as a reserve fund upon which to draw for unlooked for but needed contingencies. Under the present arrangement which obtains as a general rule on the Pacific slope, when additional expenditures above the usual or ordinary amount are called for, an assessment is laid upon the capital stock, the holders of which must pay the amount assessed or lose their stock, which would be sold on forfeiture for non-payments. This method inflicts an injustice upon the holder of stock in the corporation. He has paid for his stock, and holds to that extent an individual interest in the property of the corporation. He is unable, perhaps, to pay the assessment, and thus in defiance of equity he is made to lose the money he paid for that interest. Without due process of law he is deprived of his property.

This system holds out the means by which dishonest or scheming directors can, by levying several assessments, and by keeping back from the stockholders the knowledge of new discoveries of value in the mines, so overload them by the amount assessed that they will be forced to sell, and they themselves become the purchasers, leaving the stockholders "out in the cold;" or, in other words, "freeze them out." It cannot keep in check extravagant expenditures by directors who hold but a very limited amount of stock, and who are reckless as to what they make others pay, so long as the small amount of stock they themselves hold entails but a small expenditure.

If the stock was made non-assessable, and a certain portion of it was set aside to be sold for a working capital, sufficient to fully develop the mine, men with means would be more willing and ready to purchase the stock, because they would know the full extent of the disbursement attending upon its purchase. If an additional sum should be required to continue the work of placing the mine in a paying condition, the owners of a majority of the shares of stock could vote as to the amount to be assessed to each share.

But when and while the mine should be in a paying condition, it would be just and right, instead of making a full division of the profits, to retain, say, ten per cent. of the net earnings, and invest it in Government or State bonds, as a contingent fund, as before stated. This would be a provident provision against unexpected calls for outlay, and might be the means of saving the property to the corporation in case of disaster or sudden emergency. Shafts may cave in; destruction by fire may occur; boilers may explode; barren portions of the vein may be encountered, and other unforeseen evils may arise, which will require additional outlay to overcome them, and which, were it not for the reserve fund on hand, would be insurmountable obstacles to the further prosecution of the work.

The adoption of this system would remove many existing evils, and it surely would not create any new ones. It would place mining operations upon a more sure foundation, and with a liberal reserve on hand the stock would certainly be enhanced in value. The more stability and certainty that can be attached to mining investments, the larger those investments will be; and the larger the investments in mining developments the more that industry will be sustained and advanced. If legislative action is to be applied to the control of mining operations, it would be a praiseworthy and judicious step in the right direction to enact the establishment of this system of raising the funds with which to prosecute the work. It would respect the rights of the stockholder, and would strengthen the position of the corporation. Such a system is certainly worthy of attentive consideration.

THE steamer *Borussia*, from Liverpool for New Orleans, was abandoned at sea December 2d, and it is thought that many of her passengers were drowned.

Woolford's Improved Wrench.

We illustrate on this page an improved ratchet wrench, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency by Joseph Woolford of Plymouth, Amador Co., Cal. The wrench is of that class used for pipes, nuts, unions and couplings of all kinds where pipe-tongs, or nut, monkey or ratchet wrenches can be used.

The handle of the wrench is provided with a corrugated or roughened beveled head or jaws, having slots formed on it. On this handle is fitted a sliding head which carries a peculiarly shaped adjustable jaw. This jaw is hooked or turned at its upper end and has its internal face roughened, the lower part being curved and the upper part being plain as shown. At the heel of this jaw is placed a spring, by which it may be operated as a ratchet. In adjusting the wrench to any desired work, the head is slid up on the handle until the lug on the latch is over the slot or notch desired and the spring will engage it with said notch. This secures the head in position and regulates the gripe of the jaws. For a greater or less gripe of the jaws, the outer end of the latch or catch is depressed by the thumb and the lug thus lifted out of the slot so the head may be slid up or down the handle to another slot, where, by releasing the catch, its spring will throw the lug on the latch into the slot.

In using the wrench as a ratchet in confined spaces, the object is griped by the jaws and the spring admits of a reciprocating motion being given to the handle without removing it from the object.

In grasping circular or similar shaped objects the pressure on the adjustable-shaped jaw will come in the curved face.

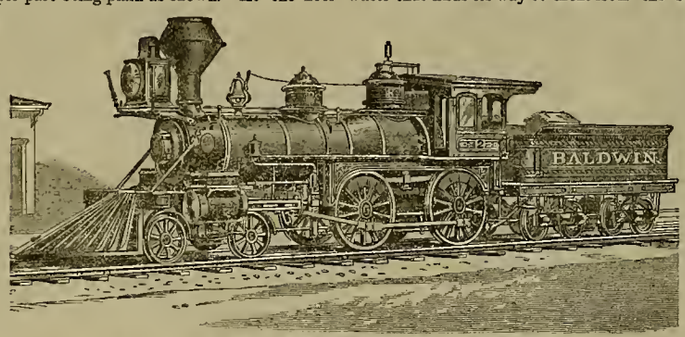
For turning square heads, bolts, etc., the upper or square portion will fit on the bolt head and the stationary jaw gripe the other side. The jaw will adjust itself to any irregularities in the object grasped.

In turning nuts, the nuts may be grasped in any position, either on the corners or the sides, and as a new hold can thus be taken on every quarter inch of surface without regard to corners, this device will work in confined spaces where no other wrench can be used.

It can be used to advantage in screwing studs into castings, as the shape allows of its use without a set-nut, thus avoiding any danger of starting the stud, when taking off the set-nut.

The ease and rapidity of adjustment to different sizes of gripe make it a very valuable bench tool, and as there are no projections on the sides, there is nothing to prevent a full turn when necessary.

The simplicity, rapidity and strength of the adjustment render the tool a very useful and practical one. There are no nuts and threads to give way under strain, and the whole is so simple that in case of breakage any blacksmith can repair it. In turning nuts it is never necessary to remove the wrench from the nut until it is tight. When the end of the stroke is reached, the handle may be slid back without removing the wrench, which on the back stroke works like a ratchet. Mr. Woolford may be communicated with at the address given above.



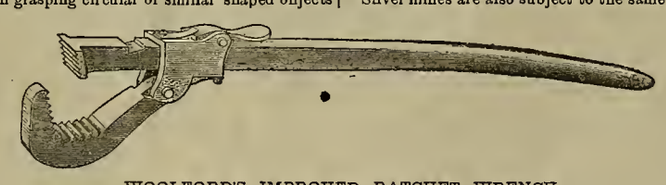
BALDWIN MANUFACTURING CO.'S LOCOMOTIVE.

Quantity of Water in Mines.

One of the most important items of expense in working many coal mines, is the enormous amount of water that has to be pumped from them. The position of the coal strata is such, that if no water rose from below them, the water that finds its way to them from the surface would still be no inconsiderable quantity. All this water has to be brought to the surface by the aid of expensive and powerful machinery, the running of which, exclusive of wear and tear, involves a heavy expense in the way of fuel and labor. In deep mines, where there is no possibility of passing the water through tunnels or drains, it entails a continuous work on the pumping engines. Some idea of the quantity to be removed may be formed from the statement of Gipsey Grove colliery in Pennsylvania, which mines about 100,000 tons of coal per annum, in which it is asserted that the water pumped out reached a million tons, or ten tons of water for every ton of coal. It is also stated that the water pumped from the Diamond colliery exceeds in tons all the coal taken from the mines in the whole Lackawanna district.

Silver mines are also subject to the same evil. When we come nearer home, we find that the Comstock mines are raising from four and a half millions to five million tons of water per year. As the depth increases, the quantity of water has also increased. This vast amount of water has hitherto been raised to, or nearly to the surface; but the recent completion of the Sutro tunnel will obviate the necessity of raising above the level of it.

From the facts given above, it will be seen that the removal of water from the mines is one of the greatest, if not the greatest item of expense. It requires the highest of engineering skill to overcome this difficulty, and were it not for the appliance of ponderous machinery, such mines as the Comstock would have to be abandoned on account of the impossibility of removing the water.



WOOLFORD'S IMPROVED RATCHET WRENCH.

BOSTON had a million-dollar fire Sunday night. The well-known publishing house of Houghton & Osgood are among the heaviest losers, their loss being about $150,000.

The Baldwin Locomotives.

The Baldwin Locomotive Works of Philadelphia are represented on this coast by Williams, Dimond & Co., No. 218 California street. The fame of the Baldwin Works is world-wide, their manufactures being largely used throughout the the United States and elsewhere. A very large order for Brazil, and another for Russia has lately been filled by these builders.

They manufacture every style of locomotive adapted for every variety of service, either narrow or broad gauge; for passenger or freight service, logging, roads, plantations, coal mines, gold mines, etc.

The following narrow-gauge roads on this coast are using Baldwin locomotives: Eureka and Palisade, Seattle Coal and Transportation Co., South Pacific Coast, Monterey and Salinas Valley, Sonoma Valley, Olympia and Tenino, etc. A specialty is made of narrow-gauge locomotives by these works.

The Baldwin steam street motor for hauling passenger cars on suburban roads, is one of the latest novelties of this manufactory. The engines are built so as to make but little noise or smoke, and are powerful enough for all purposes for which they are intended. The Geary Street, Park and Ocean R. R. Co. of this city, have recently purchased three of this style of engine; and we should advise all who find themselves in need of such power, to see the practical working of these motors before buying those of untried or unknown manufacture. This style of motor has been in use in the East for over four years past, and has given satisfaction. Williams, Dimond & Co. are prepared to furnish prices, etc., for locomotives, cars, rails, wheels and any and every description of rolling stock. The works they represent are the best outfitted in the United States for turning out the classes of work which they make a specialty. An engraving showing one of the styles of locomotives made by the Baldwin Co. appears on this page.

Mining Stocks on the Eastern Boards.

Now that the stocks of the leading mines of this coast are called at the mining boards of the Eastern cities, it is probable they will be regarded there with more consideration as to their actual merit, than to the speculative value and character which has inured to them here. The quotations here will not, after a while, materially affect their value in the Eastern markets. It may possess some slight influence, and it will undoubtedly do so, but that influence will soon pass away, and the ruling prices will fall back, there, to their intrinsic value.

Mining properties at the East are now matters for investment, with the design of making them productive. Those who put their money in them, do as they would in any other legitimate business, place it there with the intent of carrying on a paying operation. They do not invest with the view of a wild speculation out of which they will retreat as soon as they can cajole others into purchasing their stock with a wide margin of profit; they intend it as a permanent and lucrative movement on their part. The effect of this plan will be to keep such mines out of the mining boards, and leave in them only those of a purely speculative character. Those who own paying mines will prefer to have the profits go into their own pockets, instead of the coffers of outsiders.

MINING SALES.—Following sales of mines are recently reported: Eureka mine, of Como, Nev., for $50,000; Oakland, of Arizona, $15,000; Winchester, at Ten-Mile, Col., $37,000; Tip-top, Leadville, Col., $17,000; Augusta, Col., $75,000; sixth interest in Head Center, Arizona, $13,500; one-fourth of the Fairview, Leadville, Col., $17,500; one-twelfth of Miner Boy, Leadville, $50,000; half interest in Maddock, of New Mexico, $7,000; Silver King, Colorado, $3,000; Thanksgiving, Colorado, $2,000; Hecla mine, in Montana, is also reported sold for $1,000,000.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Refining Gold and Silver Amalgam.

Editors Press:—To dissipate the idea, which has arisen in the minds of several readers, that in my article, in your Christmas number, entitled "Refining of Gold and Silver Amalgam," I laid claim to hsing the inventor, or even first applier of ths chemical reaction decerihed for the purpose set forth, I would hasten to state, what, of course, every reputahle metallurgist knows, that a patent covering the chemical process for the purpose set forth was granted in 1863, and that Mr. C. A. Stetefeldt, of this city, is now about to introduce the process in perfection, as at present understood at the Ontario. What I think I did was, first, to apply it in the United States on a large scale. Eveu herein I may he mistakeu, as most wonderful things are claimed to have heen performed in Colorado; but as nothing was made puhlic to my knowledge, I will leave my claim standing to so questionable an honor. E. N. Riotte.

Refining of Gold and Silver Amalgam.

Editors Press:—From an article on the refining of gold and silver amalgam, written for the Press hy E. N. Riotte, one would suppose that Mr. Riotte was the inventor of the process described. This is not the case. The process of refining hase amalgam with chloride of copper originates with Mr. Wm. Bruckner. He firet introduced it, in the year 1862, at Morococha and Parac, Peru, South America. A patent for the United States was granted to him March 21, 1865. In the year 1867, Mr. Bruckner introduced the process iu Martini's mill, Georgetown, Colorado; also at Blackhawk, Colorado.

Before Mr. Riotte executed "his way" in Reno, he ohtained all the necessary information about this process from Mr. Reese, of Falkenau & Reese, San Francisco.

The statement "that it had been kuown for a long time"—that when quicksilver hecame "fouled" by lead or copper a slight shaking with bluestone and salt would thoroughly free it from these metals—is also without foundation.

Will Mr. Riotte bave the kindness and quote from any hook or paper, published prior to 1862, in which this method of cleaning quicksilver is mentioned?

In the fall of 1878 a series of experiments were made with this process, in the lahoratory of Falkenau & Reese, hy these gentlemen and myself, for the Ontario mill, Utah. The ohject of these experiments wae to find out if it was practicahle to regenenerate the chloride of copper from the suh-chloride by a well known reaction, namely, hy means of the oxygen of the air, sulphuric acid and salt, and to gain the surplus of copper accumulating as cement-copper. I carried out a successful experiment on a large ecale with this process at the Ontario mill in March, 1879, and the Ontario is contemplating to introduce the process. We look for Mr. Riotte's next paper on this subject with much interest.

I will finally remark that, in my opinion, Mr. Riotte overestimates the value of the process. It requires skill to execute it, and could not with safety he left in the hands of the ordinary muscular amalgamator. It is of decided advantage in such localities only where sulphuric acid can be delivered cheap, and where the hase metal in the amalgam is nearly all copper.

C. A. Stetefeldt.

Rainfall at New Almaden, California.

Editors Press:—Tbe raiu of December 19th, 4 48-100 inches, fell from 2 A. M. to 5 P. M., and was the heaviest within the memory of the oldest iuhabitant. The Alamitos creek overflowed its banke in the furnace yard, swept away heavy timhers, and threatened to destroy the bridges; but fortunately, when everything looked the worst, the waters forced tbeir way through the accumulations of furnace debris, and all danger was passed. In view of the trouhle likely to result from any addition to the unusally great quantity of furnace debris iu the creek hed, several of the furnaces were shut down in Novemher, thus decreasing the quantity of debris hy several thousand tons, otherwise the damage would have been serious.

Rainfall at the Hacienda New Almaden.

1879 to December	1st	3.86	inches.
"	" 1st	0.06	"
"	" 3d	0.28	"
"	" 8th	0.14	"
"	" 10th	0.18	"
"	" 19th	4.48	"
"	" 20th	.96	"
"	" 22d	.54	"
Total		10.50	inches.

1878, total rainfall to 31st December, 1.59 inches. Observer.

The thousand paper mills of this country used in 1878 over 46,000 tons of foreign rags, valued at $2,814,515.

The Ophir.

At the recent annual meeting of the Ophir (Nevada) mining company W. H. Patton, the Superintendent of the mine, made a comprshensive report of progress during ths year. He said: "Up to Decemher 1, 1879, the Ophir mins has yielded 19,212 1400-2000 tons of ore. Of tbis ors 19,175 100-2000 tons have been milled, leaving on hand at the mill 37 1300-2000 tons, valucd hy assay at $2,916.64. This ore has all heen extracted from the so-called 'Hardy' vein above the 2100 level—1,050 tons being taken from the 1900 level, 11,847 tons from the 2000 level and 6,278 100-2000 from the 2100 level. There yet remains a large quantity of ore in place ahove the 2100 level, the amount of which cannot be accurately determined, as the formation of the vein is very irregular. The ore reduced has yielded hullion to the value of $1,283,246.07, or $66.87 per ton, the yield heing 78% of the assay valne of the ore, no allowance heing made for moisture. The value of the gold in the hullion was $564,149.57 and of the silver $719,096.50. In addition to the ore extracted there has heen raised from the mine during the past year 60,478 tons of waste rock."

On the various levels the progress is thus noted: "On the 1600 level no work has been done except to keep open the main north drift to the Mexicau line for the purposes of ventilation; and continning the drift south from our main incline to the California north line, connecting with their main lateral drift on that level. On the 1700 level we are confined to keeping the main south drift to the California north line and the drift north to the joint Mexican winze down to the 1900 level in good repair, and also jointly with the California company the east crosscut on our southern houndary, and the winze down to the 1900 level. This work was necessary to maintain our system of ventilation. On the 1900 level no work has been done except that necessary to extract the ore lying ahove that level. On the 2000 level the main north drift reached our northern boundary on December 16, 1878, at which time the work was assumed by the Mexican company and has since heen continued through the Mexican and Union Con. ground to a connection with the Union shaft. On the 2100 level the main uortheast drift from the main incline has heen exteuded to our northern boundary and counected with the joint Mexican winze sunk from the 2000 levcl. A drift was started south from the bottom of No. 1 winze in April last, and has heen run in the Hardy vein to a point 143 feet south of the winze. The ore passed through continued of good quality for a distance of 105 feet south of the winze, and from thence to the end of the drift gave low assays. Upraises have been started on tbis level witb varying success. On the 2200 level the station has been excavated and securely timhered, and ore and waste cbutes put in place. A northeast drift has heen run iu a distance of 129 fcet from the main incline and work discontinued for the present, it heing deemed advisahle to run the main north drift on the 2300 level. A drift having a southeasterly direction has been started from the station, is now in 70 feet, and will he continued in that direction to cut the Hardy vein.

"The 2300 level was reached by the maiu incline in April last. On completion of the station and ore-chutes au east drift wae run to a point 99 feet from the incline. In July last a north drift was started from the end of the east drift, and reached our northern boundary in Septemher, a distance of 370 feet. A drift was started from the end of the maiu east drift in a southeasterly direction in October last, and run a distance of 108 feet through a vein formation, hut has not reached the Hardy vein. From that point a drift has heen started in a southerly direction towards the C. and C. shaft. It is now in 148 feet. The 2400 level was reached hy the main incline in September, and on partially completing the station, a crosscut was started in a westerly direction. This crosscut is now in 267 feet, passing through a very favorahle looking vein formation having a westerly dip for a distance of 175 feet, at which point it took an easterly dip which still continues. The 2500 level was reached last month, and after cutting out a temporary station we started a north drift which will be driven with all possible speed to our northern line connecting with the winze to he sunk jointly with the Mexicau compauy at that point, and from thence it will he continued hy the Mexican and Union Con. companies to a connection with the Uniou sbaft and form the main lateral drift of this level.

"At datc of my last auuual report the main incline had attained a deptb of 30 feet helow the 2200 station. It has since heen sunk and suhstantially timhered a distance of 498 feet, on the slope (corresponding to a vertical depth of 300 feet), to a poiut 30 feet on the slope helow the 2500 station. The material passed through has heen alternate strata of vein porphyry, birdseye porphyry and quartz dipping to the west, a vein of quartz passed through near the 2300 level showing about three feet thick and giving good assays. A numher of other improvements in connection with pumping, drainage, air compression, etc., bave heen made. In addition to the extraordinary work performed and expeuses iucurred as mentioned—our main shaft has heen almost continually under repair—the ground passed throngh between the 700 and 1465 levels pressing so heavily as to require a force of at least 40 men per day to bs employed to enlarge and re-timher it and keep it in proper condition for use.

"In my last annual report I stated that tbe prohable yield of the mine during the ensuing ysar would hs more than sufficient to pay our running expanses and render assessments unnecessary. By referring to the Secrstary's statement of receipts and dishursements you will ses that notwithstanding the immense amount of work done in the mine during the year, and the extraordinary expenses incurred. my anticipations have heen more than realized. We have heen ahle to pay a dividend of one dollar per share, amounting to $100,800, and still retain a halance of $134,892.83 in the treasury.

"Our explorations in depth will be continued during the coming year with all possihle energy, and at the same time the different levels opened and the ground thoroughly prospected in all directions. The great improvement met with in the character of our ground as greater depth is attained, gives reasonahle hope for a favorahle result in that direction, while the amount of ore still in place in the Hardy vein ahove the 2100 level, and the strong probahilities of its extending some distance helow that level, give us reasonahle hopes of greater prosperity during tbe coming year."

A "Distillation Process" of Working Ores.

A gold refinery is about to go into operatiou at Buffalo for tbe treatment of refractory ores hy a comparatively new process. The old file works in that city have been secured for this purpose and are being adapted to the new business. The ores which are to he used will come from the gold and silver regions of the West, Canada and the South. Mines which, altbough very rich, have hitherto heen practically useless on account of the refractory character of their ores will now, it is promisecd, assume their real value, and he vigorously operated.

The ore is to be refined hy what is termed tbe "distillation process." The furnace is huilt like all hlast furnaces, with a pipe running nearly horizoutal to a perpendicular hrick stack. Into the pipe, near its connection with the furnace, a jet of steam is allowed to euter. The ore, after heing distilled, or, as more familiarly termed, burnt out, passes through with the steam into the hrick stack, near the intersection of which it comes in contact with a stream of cold water, which condenses the steam, and washes the metal down into a large receiving vessel filled with water. This deposit is known as per-sulphuret of gold and silver. The heat of this furnace is gained in an entirely new manner.

The ore is heated in the furnace until the slag—that is, the sediment—sbows no gold hy an assay. After the metal reaches the receiving vessel in the shape of a per-sulphuret, it is melted down with lead, and cupelled.

The cupels in which this last process is performed are made of bones, which are hurnt, then ground as fine as flour, after which they are molded into small vessels. The leaded hullion is then run into these cupels, and then set in small furnaces, known as muffed furnaces. In these the heat is hrought to ahout 4,000 degrees; the lead is oxidized, and the gold and silver are left in a pure state in the cupels.

The metal has now reached a comhination of gold and silver; and the next work is to separate these. The cupels are taken into the wet-room, where the two are disunited hy various acids—their use depending upon the nature of the compound. After tbe two are parted, they are separately put through another acid test; after which they are melted into ingots.—*American Manufacturer.*

The Spring of the Greyhound.—Readers will remember the allusious made in the Press to the discoveries concerning the action of the horse at a high rate of speed, made by Mr. Muybridge with his method of instantaneous photography. It was plainly shown that the horse assumed attitudes which no artist ever sketched and which no observer would have thought possihle. The electric camera, however, fastened the image, and there was nothing left but to accept the testimony ou the negative. According to an account in the *Call* Mr. Muybridge has applied the same agency to the motion of the dog, and with similarly astonishing results. The cramped and improbahle positions of the dog, as shown in the negatives, would scarcely he believed hy anyone who had not seen the fact recorded hy the "unerring finger of light." It is usual to delineate a greyhound extended, but these negatives, among other positions, give the animal with his limhs gathered under him, storing his strength for the spring. These pictures, which will shortly he puhlished, will he of intense interest to all dog fanciers, inasmuch as they will supply points of observation and comparison, which may lead to a hetter selection in breeding, fostering those who show the hest points, and eliminating the feebler, thus enahling scieuce to come to the aid of nature, and provide for the "survival of the fittest." The dog is got at speed hy holding him on one side, while an attendant takes a rabhit across a line drawn in front of the camera, the ground heing covered with a sheet of India-ruhher to prevent any dust or pehhles flying up to impair the clear-cut outlines of the picture; the moment the dog passes the front of the camera the fine wire is broken, the electric circuit is complete, and the trustworthy collodian has put the fleeting vision on permanent record. These dog-pictures will create eurprise in the minds of those who have only associated the ideal greyhouud with undulating and serpentine grace.

Softening Argentiferous and Auriferous Lead.

The last number of the London *Mining Journal* gives the process of desilverizing auriferous and argentiferous lead according to ths inventiou of Mr. A. Marin-y-Garcia, of Aguilas, which is conducted as usual by the introduction of metallic zinc or spelter into the fused lead after cleaning the hath from antimony, iron and other impurities, hy discharging air under pressure into the hath. The compressed air is introduced into ths lsad pan hy a metallic pipe vertically disposed in the center of the said pan at a few inches from the bottom, aud connected with a force pump which will deliver the air at a pressure of ahout 2½ atmospheres. The scums thrown up hy the action of the air are the oxides of antimony and iron mixed with lead-oxide, and may he termed oxides No. 1. The introduction of zinc or spelter into the lead produces rich scums, which are alloys of lead, zinc and silver, the proportion of zinc is one-third approximately of the scums, and nearly the whole silver of the argentiferoue lead is concentrated in them. These rich scums are subjected to the action of a hlast of air by apparatus similar to that above described, and are converted into fine oxides of lead and zinc, the silver remains unoxidized, hut intermixed in the whole mass. This oxidation must he thoroughly effected to ensure the complete snccess of the process. These scums resulting from this operation may he termed oxides No. 2. The lead which has given its silver to the rich scums or to the oxides No. 2 is contaminated with zinc, to remove which the metal is treated with a blast of air, as before described; the result will he, first, zinc scums which may he used for a new desilverizing operation; and poor oxides of lead mixed witb oxides of zinc, which may be termed oxides No. 3. The poor lead is cast into pigs, and is ready for the markct as soft lead.

The metallurgical treatment of the three kinds of oxides must next be desorihed: The oxides No. 1, finely powdered, are dissolved in concentrated vinegar (acetic acid, pyrolignous acid), the antimonial yellow oxide remaining in suspension, aud leaving the silver, if any, in the hottom of the vessel. By filtration the antimonial oxide is completely separated, and there results a eolution of acetate of lead. The oxidee No. 2, containing nearly all the silver of the lead, are treated in the same way hy a solution of concentrated vinegar, the same being actively stirred. The silver deposits on the hottom of the vessel; meanwhile the oxides of lead and zinc dissolve completely as acetates of lead and zinc in the same mauner as in the precedent case of No. 1 oxides. The silver is collected in the form of a fine metallic gray powder, washed in clean water, refiued in graphite crucihles, and molded into ingots. The douhle acetate of lead and zinc is added to the acetate of lead ohtained from oxide No. 1. With this operation the cupellation process is avoided with all its difficulties, loss of silver and lead. The oxides No. 3, poor in silver, are subjected to the same treatment, *i. e.*, dissolved in concentrated viuegar separated into two products, some silver, which deposits in the hottom of the vessel, and the douhle acetate of lead and zinc. The silver is collected with the eilver of the oxide No. 2, and the acetates are added to the other acetates.

The soft lead and the silver are, of course, the most important products, hut Mr. Marin-y-Garcia also utilizes the secondary process—that is, the autimonial oxide and the douhle acetate of lead and zinc. The antimonial oxide is a yellow pigment, a use for which will no douht he readily found. The douhle acetate of lead and zinc can receive various treatments for its further utilization. Thus hy crystallization sugar of lead can he ohtained, and the mother liquor coutaining the acetate of zinc can be treated for white zinc hy precipitating the metal with carhonate of soda, or the liquid may he treated with carbonate of soda, to ohtain white lead with some zinc white in it. The carhonates of potash and lime give the same result, hut as the acetate of soda is the matter out of which the acetic acid is generally extracted, it seems preferable to use the carhonate of soda. The result of the precipitation hy the reactive is acetate of soda, which will he crystallized; it forms a commercial salt to he sent to market.

Explosion in a Gravel Mine.—An explosion of fire-damp occurred iu the old Kansas gravel claim on Selhy flat, just ahove Chaneys, recently, hy which two men were injured, and one narrowly escaped being killed. The incline is 340 feet deep. From it extends a side tunnel 300 feet in length, which the parties engaged in reopening the property are cleaning out. They had repaired the caves and timhered it for a distance of 100 fcet from the sump, upon quitting work Monday evening. During the night a larger amount of water than usual seeped in along the old workings, and forced the foul air forward towards the incline. When two of the men went down next morning to recommence operations, one of them, Mr. Oliver, advanced along the tunnel with a lighted candle in hand. As he reached the scene of operation, the fire-damp came in contact with the flame of the candle. There was a loud explosion that hurled him to the ground violently, tearing his clothing, burning off his eyehrows and mustache, and injuring him about the face and hands. His companion, who stood at the foot of the incline, was knocked into the water in the eump, but not hadly hurt. The force of the explosion was such as to throw loose dirt up the incline and to the top of the hoisting works on the surface.

MECHANICAL PROGRESS.

Some Hints About the Treatment of Steel.

A practical worker in steel, writing to one of our exchanges, gives the following hints in reference to the treatment of tool steel. He says: "Bosses of machine and other shops, where considerable steel is used, would be astonished could they see the amount of loss to them in broken taps, dies, reamers, drills and other tools accumulated in one year. I do not mean to say that tools can be made and hardened that will not break, but I do say fully one-third, especially taps, are broken by being improperly tempered." * * * "Thousands of dollars are lost in waste of steel and loss of time by men who try to do what they never have learned.

"First of all, never heat steel in any fire, except a charcoal fire, or a lead bath, which give it a uniform heat (I mean steel tools of any kind). Rain-water is the best water for hardening, as it contains less lime than either well or river-water. Water should never be very cold for hardening tools, as the sudden contraction of the steel will cause it to crack, more especially in cutting dies, where there are sharp corners.

"To insure thorough hardness, salt should be added to the water until the same becomes quite brackish. The salt will cause the water to take hold of the steel and cool it off gradually. I find rock or fish salt to be best, though table salt will answer. The salt is also beneficial to the carbon in steel. For removing scale from steel when put into water, ivory black should be used, putting it on the steel while it is heating, and letting it remain till the steel goes into the water.

"In tempering taps, reamers, twist drills and other like tools, great care should be taken to put them in the water in a perpendicular line, and slowly, not allowing them to remain stationary in the water, as there is danger of their being a water-crack at the water-line.

"A good way to draw the temper is to heat a collar or any suitable iron with a hole in the center, and draw the tool backward and forward through it, until the right temper is obtained, which will be uniform."

A NEW PEGGING MACHINE.—A couple of young machinists of Medway, Mass., have recently completed and got into working order a pegging machine, which is destined to work a revolution in that branch of the boot and shoe industry. It is a double-row machine, so adapted that two rows of pegs can be driven at once. It carries two awls, two drivers and two strips of peg-wood. The inventors claim for their machine the following advantages: Double speed, inasmuch as it drives two pegs at once, and as the pegs are driven simultaneously in each row, the rows are sure to be perfectly parallel. The pegs of the inside row are set directly opposite the spaces between the pegs of the outside row, thus giving the boot the appearance of hand-pegging, which result cannot be attained by any other pegging machine. It can peg across the rear end of a tap-sole. The inside row can be stopped or continued at the pleasure of the operator, without stopping the machine; or, if desirable, only one row need be inserted at a time. The great fault of the old pegging machines—destruction to lasts—is obviated, and a saving of two-thirds made by this machine, as a long row for the outside and a short one for the inside can be driven at once, thus making light work for the last-puller, and avoiding all danger of breaking the shank.

STEEL-WIRE strings of pianofortes are very commonly annealed by making the wire red-hot and then plunging it into boiling water. Ordinary experience would suggest, says the *Scientific News*, that this must harden the steel in some degree, but it has been tried upon samples of steel—including mild Bessemer steel, shear steel of different qualities, and the hardest Sheffield crucible steel—and it was found that in every case, when the operation was properly performed, the steel was remarkably annealed; samples have been cut from the bar—one heated and slowly cooled by burying in ashes under a furnace grate, the other by immersion in boiling water—the result showing that, when subjected to bending tests, those which had been cooled in the boiling water would bear more severe flexure, without cracking, than the pieces which had been more slowly cooled in the ashes. They were not so soft, but were tougher and more reliable when subjected, while cold, to violent blows of the hammer.

STEEL BOILER PLATES.—Investigations have recently been made on the German railways as to the applicability of steel for boiler plates and the advantages which it possesses over iron. The conclusions drawn are not particularly favorable to the introduction of steel plates, which appear to possess certain properties giving rise to injurious tensions and cracks during the bending and riveting of the plates. The German engineers consider that, if it is possible to use good iron plates of the strength of 45,000 lbs. to 47,000 lbs. per square inch without incurring too much expense, the balance would incline to the iron plate. Of the two processes now in vogue for producing steel plates, the Bessemer process is the least suited, Siemens-Martin or crucible steel being recommended.

Corrosion of Boilers by Fatty Matters.

The Chief of the Experimental Railway Company of France, M. A. Mercier, gives, in the *Annales des Mines*, the results of some experiments upon the changes produced by fatty matters in the wrought and cast-iron parts of engines exposed to the action of steam. M. Mercier had occasion to examine in the laboratory some hard balls taken from the cylinders of steam engines, and which were generally attributed to the use of acid lubricating oil. The balls, when crushed and digested in ether, left an insoluble residue of peroxide of iron, while the soluble part was composed of oleic acid, combined with the oxide of iron mixed with a non-decomposed oil.

A series of experiments was made to determine whether the formation of this oleate of iron resulted from the use of oil more or less rancid, having an acid reaction, or whether it was the product of the decomposition of neutral fatty matter in presence of iron and of steam at a high pressure. According to these experiments, the fatty matters have no need of being acid or rancid, nor of being heated above 212° Fahr., to decompose steam in presence of iron, and thus produce oleate of iron, glycerine and hydrogen. Observations made upon steam engines which showed corrosion in those parts exposed to oil and steam, suggested the following experiment: An iron bucket containing wrought-iron chippings, thoroughly saturated with oil of colza previously neutralized, was left during eight days in a reservoir supplying steam to several steam hammers. At the expiration of this time there were taken from the bucket about 30½ cubic inches of very thick oil, which flowed with difficulty and emitted an odor similar to that produced by the action of an acid on iron; the iron was strongly corroded, and the oil—colored to a dark brown and entirely soluble in ether—contained 7% of the oxide of iron. This oleate of iron oxidized rapidly on contact with air, and, like all the minimum salts of iron, gave up some peroxide of iron; when again placed in contact with iron it attacked the iron and was thus brought back to its first state of saturation. In this manner can be explained the large proportion of non-combined peroxide of iron contained in the matter found on the valve-face of an engine at Valance, upon which an observation was made.

These facts appear to clearly explain the corrosions of certain boilers receiving fatty matters brought over from the cylinders by the exhaust steam, or used to lubricate the throttle valve of locomotives.

In locomotives the steam is generally taken from the upper part of the boiler by means of an immersed slide throttle valve; the oil used for lubricating the latter becomes saturated with iron, and being thus made heavier than water sinks to the bottom of the boiler where it attacks the iron plates, forming in them those excavations which are only found when feed-water is used of such purity as not to deposit the lime-scale that in most cases preserves the boilers.

The use of mineral oil, thickened if necessary with wax or paraffine, for the lubrication of moving parts placed in the steam, would be without doubt a good means of preventing changes in the material of such organs.

UTILIZATION OF STEEL SCRAP.—The rapid development of the use of steel for shipbuilding in Scotland, has brought out an interesting question in regard to the utilization of the large amount of steel scrap which the shipyards now find accumulating on their hands. It appears that the shipbuilders were much dissatisfied with the low rates paid them by the Steel company of Scotland, the chief producer of steel and only user of scrap who were not willing to take it back at less than scrap iron. The question is now solved, it seems. A Coathridge ironmaster found that he could work it up into rods almost as easily as scrap iron, but his experience showed him that it required a much higher heat to weld the pieces into a solid billet. In testing the rods it was found that, while the average of the bars made by the Steel company of Scotland stood a tensile strain of 28 3 tons per square inch, the rods made from the steel scrap only bore a strain of 26.6 tons per square inch, with an equal extension of 20%. The bars made from the steel scrap have not been tested for their shearing strain; but it is thought that they would stand better than the Steel company's bars. The great advantage in the scrap steel is its price, as it can be produced at about £2 per ton less than steel bars direct from the steel makers. As Lloyd's and the Board of Trade only required steel to stand a tensile strain of from 24 to 26 tons per square inch, welding up and working the scrap steel into bars will, it is thought, prove a decided success.

A NOVEL MOTOR.—A novel form of motor has been invented by Dr. Fleischer, of Kiel (Germany), and applied by him to ship propulsion. The principle of the motor is the reactive water-jet, a device not new in itself, but which, our authority asserts, this inventor has materially improved. The vessel is propelled by two water-jets, without the aid of paddle-wheels, now appears plain that to be of any value for propeller, engines or rudder. The discharge-nozzles are swiveled so that they may be directed this way or that, and so control the direction of the vessel. The motor, as applied to the *Pellworm* (a vessel 75 feet long, 12 feet beam, flat-bottomed, and drawing 3½ feet of water), propels her at the rate of six knots per hour, and develops 25 horse power, or about 40% of the power of the steam used.

SCIENTIFIC PROGRESS.

A Horological Bureau.

Arrangements are now being perfected for the establishment of a horological bureau in connection with the Sheffield Scientific School at New Haven, Conn. A suitable building will be erected, a telescope mounted, clocks placed, and every possible convenience arranged to make the bureau as perfect and complete as possible. Mr. Waldo, the gentleman who is to have charge, is already upon the ground and directing the progress of the work.

There are already one or more establishments of the kind in the country—notably the one at Cambridge, which supplies the time for the railroads converging at Boston. But the supply of approximately correct time is the only use for which this and other observatories of the kind in this country have hitherto been employed, while the chief object of this new observatory, in addition to determining time, is the rating of watches, a thing which has not yet been attempted in this country.

To rate a watch is "to determine the rate of its gain or loss in respect to true time." Swiss watches are rated in Europe, and have been greatly improved thereby. No American watches have ever yet been rated, and manufacturers in this country are placed to disadvantage in consequence. Work of this kind has always been considered government work, or the work of scientific associations. It is now, for the first time, to be inaugurated here, under the direction of a liberally endowed association. This bureau will add nothing to the educational advantages of Yale, but will be simply a scientific work.

In initiating the work, after everything is in readiness, a sidereal clock will be started, as nearly correct as possible, after which observations will be made, to get absolutely correct time. In arriving at such a result, the sun is not the central point; but some of the numerous clock's stars, as they are called, whose time is known, will be selected and observations made at night, although with the larger stars observations may also be made in the day time. The sun will be abandoned, because one observation in twenty-four hours is not enough; an observation may be made with each star every twenty-four hours. New Haven time will be taken, but New York time will be furnished also. The Waltham Company will send 100 or 200 watches for rating, as soon as everything is ready. "Rating" for private parties, we presume, is paid for, and will form, to some extent, a source of revenue to the bureau. This bureau will probably furnish standard time for the whole country, as time can be sent by telegraph and computed for any known longitude.

The Practical Use of Science.

The adulteration of various articles of food have of late become so alarming, and the various processes are so skillfully conducted that the aid of science is being called in to assist in the detection of such practices, in order that the offenders may be more readily brought to justice. The French authorities are just now wrestling vigorously with those engaged in palming off upon the public a spurious article of olive oil, the adulterations of which have become so universal that it is difficult to get a pure article anywhere in the European market. According to the *Correspondence Scientifique*, the government recently referred the matter to a special committee of the Academy of Sciences, which has recommended the use of a new instrument which is called the diagometer. This instrument, which has been devised by Prof. Luigi Palmieri, has its action based on the differences in the electric conductivity of oils. Pure olive oil has very feeble conductive properties, which (as is also the case with other oils) increase with the amount of impurities added. The only oils that are known to compare to olive oil in respect to their low conductivity are the oils of pine-seed and hazel nuts; and these, fortunately, are too expensive to be used in the adulteration of the former. The conclusions of the committee on the practical value of the diagometer have not yet been announced; it is noted, however, that its use demands considerable manipulative skill. For the correctness of this abstract we refer to the London *Chemical News*.

Butter is another article to preserve the purity of which the aid of the scientist has been invoked. In reply to such a demand Herr Fisber asserts that the examination of butter by polarized light with a magnifying power of about 200 to 300 diameters, affords a much more certain criterion of its purity than a specific gravity test. Examined in this way, fictitious butter shows not only the globular drops and salt crystals characteristic of genuine butter, but likewise other more or less developed crystals. The author also finds this method may be applied to the determination of different kinds of fats, inasmuch as each of these shows characteristic colors in polarized light. Mutton tallow, for instance, always gives a blue tone; cocoa butter gives colors passing from the brightest green to the deepest red; the fat of oxen gives green and white luminous effects; while small bright green semi-lunar and vermicular bodies appear in common light. Hog's lard shows many colors, especially red and blue—yellow, which is characteristic of cocoa butter, being absent.

The Immensity of the Stars.

Le Monde de la Science has the following interesting "Considerations on the Stars," by Prof. J. Vinot: "It is known that the stars are true suns, that some of them are larger than our own sun, and that around these enormous centers of heat and light revolve planets on which life certainly exists. Our sun is distant from us 38,000,000 leagues, but these stars are distant at least 500,000 times as far; a distance that in fact is incommensurable and unimaginable for us. Viewed with the unaided eye the stars and the planets look alike; that is, appear to have the same diameter. But, viewed through the telescope, while the planets are seen to possess clearly appreciable diameters, the stars are still mere luminous points. The most powerful of existing telescopes, that of Melbourne, which magnifies 8,000 times, gives us an image of one of our planets possessing an apparent diameter of several degrees. Jupiter, for instance, which seen with the naked eye, appears as a star of the first magnitude, with a diameter of 45° at the most, will in this telescope have its diameter multiplied 8,000 times, and will be seen as if it occupied in the heavens at an angle of 100°. Meanwhile, a star, alongside of Jupiter, and which to the eye is as bright as that planet, will still be a simple dimensionless point. Nevertheless that star is thousands of times more voluminous than the planet.

"Divide the distance between us and a planet by 8,000, and you have for a result a distance relatively very small; but divide by 8,000 the enormous number of leagues which represents the distance of a star, and there still remain a number of leagues too great to permit of the stars being seen by us in a perceptible form. In considering Jupiter, or any of the planets, we are filled with wonder at the thought that this little luminous point might hide not only all the visible stars, but a number 5,000 fold greater, for of stars visible to our eyes there are only about 5,000. All the stars of these many constellations, as the Great Bear, Cassiopeia, Orion, Andromeda, all the stars of the zodiac, even all the stars which are visible only from the earth's southern hemisphere, might be set in one plane, side by side, with no one overlapping another, even without the slightest contact between star and star, and yet they would occupy so small a space that, were it to be multiplied 5,000 fold, that space would be entirely covered by the disk of Jupiter, albeit that disk to us seems to be an inappreciable point."

PRODUCING ALCOHOL BY ELECTRICITY.—Berthelo's experimental attempts to form alcohol by electricity were conducted as follows: A battery of from six to eight Bunseu elements was arranged in connection with an oscillating commutator, so as to give alternately positive and negative currents twelve to fifteen times a second to two cylinders of spongy platinum, acting as electrodes. These platinum cylinders were immersed in acidulated water, and the contacts so arranged that neither oxygen nor hydrogen was disengaged, the water being reformed as soon as decomposed. Thus regulated, the electrodes of the apparatus were immersed in an aqueous solution of glucose. In this way alcohol was formed, although in very small quantities, but it is expected that when some improvements in the apparatus are made, the process will be much more rapid.

A NEW ANTISEPTIC.—The *Journal of Chemistry* describes a new antiseptic—a double salt of borate of potassium and sodium, which is made by dissolving in water equal portions of chloride of potassium, nitrate of sodium, and boracic acid, filtering and evaporating to dryness. It gives no bad taste to food. Butter may be kept sweet by it at ordinary temperatures for a week. Meat, game, etc., dipped in a weak solution remain pure for a long time. A piece of meat well rubbed with the salt and laid away two years ago, is now in perfectly good condition. Eggs, dipped in a solution of this antiseptic, remain good for a long time.

CARBON IN COMETS.—It is generally believed that some compound of carbon exists in comets, and it has been assumed that the bright lines in the spectra of these bodies were due to that compound being in an incandescent state. G. J. Stoney has advanced another hypothesis. He suggests that the bright lines are caused by the light of the sun falling on the compound of carbon, and rendering it visible in the same way that light renders moon, the planets and other opaque objects visible, the vapor of carbon being opaque to the particular rays which appear as bright lines in its spectrum.

RECENT experiments, it is said, seem to show that chlorine, which has hitherto been classed as one of the elements, is a compound, one of the elements of which is oxygen. It is known by chemists that ozone has a higher density than oxygen in its usual state, the explanation given being that the ozone molecule has three atoms oxygen, whereas the ordinary oxygen molecule consists of but two. On heating ozone the density is decreased, and the gas becomes plain oxygen. In this case, one of the "elements" must probably be struck from the list.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 11.		Week Ending Dec. 18.		Week Ending Dec. 24.		Week Ending Dec. 31.	
Alpha	8½	7⅜	9	8	7⅞	6	9½	8¼
Alta	3.45	2.90	3½	2.60	2¾	1.80	3.15	2.60
Andes	70c	55c	70c	45c	35c	25c	45c	30c
Alps								
Argenta	1	90c	1⅛	1	1.05	95c	1.15	1
Atlantic	5c							
Aurora Tunnel								
Baltimore Con								
Belcher	2	1.40	1.80	1	2¼	1.70	4.10	2.90
Belmont	1.45	90c	85c	50c	80c	75c	85c	70c
Best & Belcher	13⅛	10⅜	11⅛	9	7⅛	10⅜	10	
Bullion	4.65	3.45	4.10	3.60	3.70	2¾	3.70	3¼
Bechtel	1¼	1.40	1.55	1.30	1.35	1¼	1½	1.30
Belle Isle	1½	1.30	1½	1¼	1½	1.20	1.45	1.30
Bodie	9	8⅝	9	8¾	8¾	8½	9¼	9
Benton	2	1.10	1½	1.05	1.45	85c	1¼	1.60
Bulwer	10	9½	9¾	6¾	9¼	8¾	9¾	9½
Boyle								
Black Hawk	40c	20c	50c	25c	50c	40c	60c	
Belvidere	1	60c	1¼	90c	60c	50c	75c	60c
Booker	70c	55c	70c	50c	50c	30c	45c	40c
Caledonia	1.10	50c	1.40	90c	1.30	70c	1¼	1.05
California	3.85	3¼	4.40	3.80	3.95	2.70	4.10	3.90
Challenge	1.80	1¼	2	1.55	2¼	1¼	1.90	1.70
Chollar	7	6¾	6¾	5¾	5¾	4½	6	5½
Confidence	7	5½	6	6¼	7	6	6¾	6¼
Con Imperial	60c	50c	60c	35c	40c	25c	45c	35c
Con Virginia	4.95	3¾	4.70	3.95	3.90	3	4	3¾
Crown Point	1.80	1½	2	85c	2	1.45	2¾	2.40
Con Washoe								
Champion	30c	20c	20c	15c	20c	10c	15c	10c
Concordia	25c	15c	25c	20c			35c	
Dayton								
DeFrees								
Dancy								
Day	1.10	70c	1	80c	95c	70c	75c	65c
Eureka Con	2¼	1¼	1¾	1⅝	1¼	16	1⅝	
Excbequer	3.40	2.60	3.10	2.70	2¾	1¼	3	2¼
Endowment	80c	75c	75c	70c	65c	60c	60c	40c
Gen Grant								
Grand Prize	1	70c	75c	30c	50c	30c	1	
Gila	25c	20c	20c	15c	15c	5c	10c	
Golden Chariot								
Golden Terra	12½	12	12	10	12		12	10
Goodshaw	20c	5c	10c		10c	5c		
Gould & Curry	7	5¼	5⅞	4	4¼	3¾	5¼	4¼
Hale & Norcross	9¾	7⅛	8¼	5¼	6¼	5	6¼	6
Hillside	1.10	1	1¼	85c	1¼	85c	1.40	
Highbridge								
Homestake								
Hussey								
Independence	60c	40c	75c		80c	75c	1	
Julia	1½	80c	1	50c	1.50	50c	2	1.55
Justice	1.80	1¼	1.40	1	1	60c	1.70	1¼
Jackson	3½		4	3¼	3½			
Joe Seaches								
K K Con	4¼	4	6	4¼	5¾	4¼		
Kentuck	3	2.60	3	2¾	2¾	2¼	3	2¾
Kossutb			10c					
Keystone								
Lady Bryan	40c	25c	35c	25c	20c	10c	20c	5c
Lady Wash	70c	50c	60c	45c	50c	30c	50c	45c
Leopard	15c	5c	15c		10c	5c	15c	
Leviathan	30c	20c	50c	25c	30c	20c	45c	30c
Leeds	40c		55c	40c	40c			
Lee								
May Belle								
Modoc								
Manhattan	1⅜		1⅜		1½		1½	
Martin White	1¼	85c	90c	50c	60c	50c	60c	55c
McClinton	40c	35c	50c	35c	40c	35c	50c	40c
Meadow Valley								
Mexican	22½	18	20	16	17½	15¾	18	15¾
Mides								
Morning Star								
North Con Virginia								
New York	35c	30c	35c	25c	25c	10c	35c	20c
Northern Belle	6¾	6¼	6¾	5¾	6¼	6	6¾	
New Coso								
Navajo	30c	25c	30c	25c	25c	20c	25c	
Occidental	1¼	85c	1	90c	50c	25c	1	60c
Ophir	25	21	21¾	16	18¾	15½	20	17
Oriental	35c	5c	35c	25c				
Overman	5¾	4¼	4¾	3¾	3.70	2¼	6¾	5¾
Panther								
Phenix								
Phil Sheridan	25c	20c	25c	20c	20c			
Potosi	4.05	2.60	3.65	2¾	2.90	2¼	3	2.80
Prospect								
Raymond & Ely	1	50c	1	75c	90c	70c	90c	
Richer								
Rock Island								
Rye Patch								
Rough & Ready								
Savage	8	6¾	7	4.05	4.80	3.85	6	4.35
Seg Belcher	13⅛	13	15	10	12		14	11
Sierra Nevada	24¼	24¼	28	20¾	22	17	18¾	17
Silver Hill	1	65c	1	70c	80c	35c	1	70c
Silver King	5¾	4	4	3¾	6	5	7	6¼
Silver Prize								
Succor								
Summit	90c	60c	75c	50c	80c	50c		
Scorpion	3¼	2¼	2.95	2¼	2.60	2¼	3	2.60
Solid Silver	35c		20c	10c	20c	15c		
South Bodie	15c	10c	25c		15c	10c		
South Standard	25c							
Star	20c	15c	20c		15c		10c	
St. Louis								
Syndicate	3¼	2.20	2¾	2¼	11	90c	1.40	1¼
Tioga Con	2	1.65	1.90	1.30	1¾	1¼	2.20	2.10
Tiptop	1.90	1.70	2	1.80	2	1¾	2	1.90
Trojan	5c							
Union Con	57½	44¾	45	39	44	26¾	41¾	38¾
Utah	13¾	10	12	9¼	9¾	6	9	8
Vermont Con								
Ward	1.30	1	1.30	1	1.10	50c	1.05	1
Wells-Fargo								
Woodville	15c							
White Cloud								
Yellow Jacket	10¾	8¾	10¾	8¼	9¾	6¾	9¼	8¾

Sales at S. F. Stock Exchange.

Monday A. M., Dec. 29.

260 Bullion ..... 3.70@3.60
443 Benton ..... 1⅛@1.70
125 Best & Belcher 10
515 Belcher ..... 2.90@3
110 Confidence 6¾
70 Con Imperial ..... 35@40c
230 Caledonia ..... 1¼@1.05
360 Crown Point ..... 2.45@2.70
395 California ..... 4@3.90
200 Chollar 5½
180 Con Virginia ..... 3.80@3¾
450 Challenge ..... 1.90@1¾
270 Con Dorado 95c
150 Dardanelles 80c
195 Exchequer ..... 2½@2.85
650 Golden Gate 1.10
125 Gould & Curry ..... 4¼@5
230 H & Norcross 6
385 Julia ..... 1.95@2
410 Justice ..... 1.55@1.60
100 Kentuck 2¼
450 Challenge ..... 1.90@1¾
270 Con Dorado 95c
150 Dardanelles 80c
195 Exchequer ..... 2½@2.85
650 Golden Gate 1.10
125 Gould & Curry ..... 4¼@5
230 H & Norcross 6
385 Julia ..... 1.95@2
410 Justice ..... 1.55@1.60
100 Kentuck 2¼
100 Overman ..... 5¾@5⅝
640 Ophir ..... 17@18
270 Potosi ..... 3@2.80
925 Scorpion ..... 2¾@2.90
270 Silver Hill ..... 80@85c
305 Sierra Nevada ..... 17@17½
365 Savage 5¾
20 Seg Belcher 11
30 Utah 8¾
493 Union Con ..... 38@38¾
220 Ward ..... 1@1.05
370 Yellow Jacket ..... 8¼@8¾

AFTERNOON SESSION.

100 Albion 40c
180 Addenda 35c

SALES OF LAST WEEK AND THIS COMPARED

Wed'sday A.M., Dec. 24.		Wed'sday, A.M., Dec. 31.	
70 Alpha	7@7¼	20 Alpha	9
200 Alta	2.30@2¾	350 Alta	3@3.15
200 Andes	35c	100 Andes	35c
685 Benton	1.40@1.45	410 B & Belcher	10¼@10⅝
350 Best & Belcher	9@9¼	675 Belcher	3.50@3.10
525 Belcher	2.35@2¾	75 Bullion	3.00
950 Bullion	2¼@3	320 Benton	1.70@1.60
270 Caledonia	3½@3⅝	270 Con Imperial	40@45c
335 Chollar	6¼@5¾	170 Con Virginia	4
185 Con Virginia	3.35@3.30	475 Crown Point	2.60@2½
700 Con Imperial	40c	70 California	3.95@3.90
330 Crown Point	2@1.90	145 Chollar	5½@6
480 Caledonia	1¼@1.15	30 Confidence	6¾
140 Challenge	2.40	380 Caledonia	1.15@1.20
250 Con Dorado	80@90c	125 Dardanelles	80c
150 Dardenelles	83c	220 Exchequer	2.90@2.80
115 Exchequer	2½@2¼	900 Flowery	30c
350 Gould & Curry	4¼@4.40	180 Gould & Curry	5¼@5¼
330 Golden Gate	1.10	330 Golden Gate	1.10
140 Hale & Nor	5¾@6	595 Hale & Nor	6¼@6
160 Julia	1.80@1.40	195 Justice	1¼@1.60
250 Justice	95c@1	50 Julia	1.95
20 Kentuck	2¼	10 Kentuck	2¼
200 Lady Bryan	20c	345 Lady Bryan	15@20c
210 Lady Wash	40@50c	90 Lady Wash	50c
250 Leviatban	30c	150 Leviatban	30c
605 Mexican	17@17¾	510 Mexican	17¼@18
200 Mackey	10c	400 Mackey	10c
350 Mt View	1.30@1.20	400 New York	25@20c
1750 N Bonanza	35@40c	305 N Bonanza	35@35c
230 Ophir	16¾	235 Ophir	19@20
205 Overman	5¾	110 Occidental	1@90c
200 Potosi	2.80@2¾	105 Potosi	3
50 Solid Silver	15c	60 Savage	6@6¼
1380 Sierra Nevada	18@18¾	695 Sierra Nevada	18@17¾
380 Savage	4@4.80	20 Seg Belcher	14
323 Scorpion	2.60@2¼	435 Silver Hill	70@85c
330 Silver Hill	35c	50 Scorpion	2.80
380 Union Con	42@44	80 Utah	8¼@8¾
310 Utah	8¾@8¾	425 Union	41@40
340 Ward	90@85c	55 Ward	1
470 Yellow Jacket	9@9¼	560 Yellow Jacket	9¼@9½
AFTERNOON SESSION.		AFTERNOON SESSION.	
300 Addenda	25@30c	330 Addenda	40c
50 Argenta	1	300 Atlas	10c
490 Belle Isle	1.20@1¼	3180 Argenta	1.30@1
50 Belmont	70c	200 Union	40c
125 Bechtel	1.30	200 Boston	1.20
10 Bulwer	9	420 Belmont	85@90c
150 Bodie	8¾@9	150 Belvidere	75c
270 Belvidere	50@75c	410 Booker	35@40c
250 Black Hawk	50c	125 Bodie	8¾@8¾
100 Boston	1.30	85 Belle Isle	1.35@1.50
100 Booker	35c	200 Becbtel	1.65@1¾
50 C Pacific	4¼	25 C Pacific	4¼
1900 Day	80@70c	250 Caledonia (B H)	3
135 Eureka Con	16	50 Eureka Con	16¼
150 Goodshaw	5c	150 Goodshaw	5c
330 Grand Prize	1.20	400 Endowment	40c
250 Jupiter	1.20	375 Grand Prize	1.15@1.10
25 K K Con	5	323 Jupiter	1.15@1.20
100 Mono	4	100 Leopard	15c
110 Manhattan	1¼	100 Lucas	50c
30 Mammoth	2	120 Martin White	50c
115 Noonday	3¼	50 Manhattan	1¼
130 Northern Belle	6¼	210 Mammotb	1.85@1.80
80 Paradise	50c	175 Mono	4¼@4¼
150 S Noonday	1¾	100 McClinton	40c
100 S Bulwer	45c	70 Mt Diablo	1¾
250 Summit	75c	685 Noonday	4.60@4¼
70 Silver King	5¾	75 N Noonday	3
200 Tiptop	2	50 Northern Belle	6¼
130 Tioga Con	1.60	100 Oriental	15c
270 Wales	6@7	50 Paradise	75c
		650 Queen Bee	20c
		880 Raymond & Ely	90c@1
		700 S Bulwer	55@60c
		400 S Noonday	1.85
		170 Syndicate	1¼@1.40
		100 Silver Hill	1.15c
		950 Tiptop	2
		100 Tuscarora	15c
		825 Tioga Con	2.20@2¼
		100 University	15c
		780 Wales	3¼@3.05

Pacific Board—Latest Sales.

Tuesday A. M., Dec. 30.

50 Alta 2¾
80 Alpha 8
100 Belmont 70c
325 Beat & Belcher ..... 9¼@9⅜
525 Belcher ..... 3.05@2.95
500 Con Imperial 35c
240 Crown Point 2¼
135 California ..... 3.85@3¾
160 Chollar ..... 5¼@5.40
170 Con Virginia ..... 3¾@3.90
150 Exchequer 2.80
210 Gould & Curry ..... 4.90@4.95
120 Hale & Nor ..... 6@5¾
120 Justice ..... 1.55@1½
525 Julia ..... 1.80@1.95
230 Mexican ..... 16¼@16
100 N Bonanza 50c
230 Ophir ..... 17@17¼
180 Savage ..... 5¾@5¾
20 S Nevada ..... 17¼@16¾
20 Utah 7¾
160 Yellow Jacket 8¾

AFTERNOON SESSION.

110 Belcher ..... 2¾@2.70
80 Sullivan 3.55
10 Benton 1.65
180 Caledonia 1.15
50 Crown Point 2.55
100 Endowment 44c
40 Gould & Curry 5
50 Hale & Nor 6.05
370 Justice 1.55
170 Julia ..... 1.95@2
20 Mexican 17
50 N Bonanza 55c
10 Overman 5¾
25 Ophir ..... 18¾@18¾
10 Sierra Nevada 18
100 Savage 5¾
50 Scorpion 2.80
235 Silver Hill ..... 80@75c
20 Ward 1.05

California Board—Latest Sales.

Tuesday A. M., Dec. 30.

30 Alta 2¾
70 Argenta 1.05
900 Atlas ..... 15@10c
240 Belcher ..... 3.10@3
30 Best & Belcher 9¼
150 Benton ..... 1.80@1¾
30 California 3.95
30 Con Virginia 3.85
200 Con Imperial 40c
60 Crown Point ..... 2½@2.42½
20 Chollar 5¾
330 Caledonia ..... 1¼@1.20
120 Exchequer ..... 2.85@2.80
110 Endowment 70c
40 Gould & Curry ..... 4.60@4.65
30 Hale & Nor 6
100 Julia 1.95
130 Justice ..... 1.70@1¾
100 Leviathan 30c
50 Mexican ..... 16@15¾
100 New York 27½
20 Ophir ..... 17@17¼
30 Overman 6
20 Potosi 2.95
120 Phil Sheridan 20c
45 Savage ..... 5¾@5¾
30 Sierra Nevada ..... 17@16¾

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	2	20	Dec 10	Jan 14	Feb 3	T H Dixon	238 Montgomery st
Alpha Con M Co	Nevada	11	1 00	Nov 26	Dec 30	Jan 20	Wm Willis	309 Montgomery st
Alta S M Co	Nevada	16	50	Dec 18	Jan 22	Feb 10	W H Watson	302 Montgomery st
Andes S M Co	Nevada	13	25	Dec 18	Jan 23	Feb 16	B Burris	Nevada Block
Aurora Tunnel & M Co	California	4	10	Nov 13	Dec 15	Jan 3	C V Hubbard	203 Busb st
Bechtel Con M Co	California	4	25	Dec 22	Jan 30	Feb 9	W H Lent	Nevada Block
Belcher S M Co	Nevada	20	1 00	Nov 17	Dec 23	Jan 13	Jno Crockett	203 Busb st
Belvidere M Co	California	5	25	Dec 18	Jan 27	Feb 21	C V D Hubbard	203 Busb st
Best & Belcher M Co	Nevada	16	1 00	Nov 5	Dec 29	Jan 19	Wm Willis	309 Montgomery st
Black Hawk G M Co	California	7	25	Nov 14	Dec 13	Jan 7	H A Cbarles	419 California st
Caledonia S M Co	Nevada	29	50	Nov 10	Dec 16	Jan 6	R Wegener	414 California st
Champion M Co	California	5	20	Dec 24	Jan 30	Feb 20	J Crockett	302 Busb a
Con. Imperial M Co	Nevada	10	20	Dec 10	Jan 14	Feb 4	W E Dean	203 Bush st
Curtis Con M Co	Nevada	2	05	Nov 21	Dec 24	Jan 12	H S Stone	419 California st
Crown Point G & S M Co	Nevada	39	1 00	Nov 17	Dec 22	Jan 12	Jas Newlanda	203 Busb st
Defiance G M Co	California	4	30	Nov 12	Dec 17	Jan 6	W H Lent	309 Montgomery st
Double Standard M Co	California	2	15	Dec 10	Jan 14	Feb 4	W H Lent	309 Montgomery st
Dudley M Co	California	6	25	Nov 19	Dec 20	Jan 16	E C Masten	309 Montgomery st
El Tesoro	California	8	25	Dec 15	Jan 30	Feb 16	W H Chickering	214 Sansome st
Europa M Co	Nevada	8	10	Dec 30	Feb 3	Mar 6	J L Fields	240 Montgomery st
Flowery M Co	Nevada	3	25	Nov 14	Dec 19	Jan 7	W W Stetson	309 Montgomery st
Goodshaw M Co	California	2	25	Nov 24	Jan 5	Feb 2	Y Fernbach	327 Pine st
Grand Prize M Co	Nevada	3-	75	Nov 25	Dec30	Jan 20	E M Hall	327 Pine st
Hillside M & M Co	Nevada	1	50	Nov 21	Dec 24	Jan 13	F Frankenthal	330 Pine st
Independence M Co	Nevada	4	25	Nov 15	Dec 18	Jan 8	E M Hall	327 Pine st
Indian Queen M & M Co	Nevada	2	10	Nov 6	Dec 20	Jan 10	A K Durbrow	309 Montgomery st
Julia Con M Co	Nevada	10	1 00	Nov 19	Dec 24	Jan 16	H A Charles	419 California st
Jupiter S M Co	California	6	35	Nov 12	Dec 15	Jan 3	E C Masten	309 Montgomery st
Justice M Co	Nevada	30	50	Nov 29	Jan 3	Jan 24	R E Kelly	419 California st
Lady Washington Con M Co	Nevada	1	20	Dec 22	Jan 26	Feb 14	W H Watson	302 Montgomery st
Mammoth M Co	California	3	1 00	Dec 5	Jan 15	Feb 13	A W Field	302 Montgomery st
Martin White M Co	Nevada	5	50	Dec 10	Jan 12	Feb 3	J J Scoville	309 Montgomery st
McCracken Con M Co	Arizona	4	25	Nov 17	Dec 18	Jan 7	A Wenzelburger	216 Sansome st
North Bonanza M Co	Nevada	4	25	Nov 21	Dec 26	Jan 30	W W Stetson	309 Montgomery st
North Carson S M Co	Nevada	9	25	Dec 13	Jan 15	Feb 5	O Betts	113 Leidesdorff st
Oriental Con G & S M Co	California	5	25	Nov 8	Dec 10	Dec 27	H C Hinman	411 California st
Original Gold Hill G & S M Co	Nevada	8	15	Dec 20	Jan 26	Feb 14	J M Buffington	302 California st
Overman S M Co	Nevada	44	2 00	Nov 25	Dec 31	Jan 21	Geo D Edwards	414 California st
Real del Monte M Co	Nevada	9	25	Dec 1	Jan 3	Jan 24	C V D Hubbard	203 Busb st
Savage M Co	Nevada	40	1 10	Nov 9	Jan 2	Jan 22	E B Holmes	309 Montgomery st
Senator M Co	Nevada	1	10	Dec 22	Jan 24	Feb 21	L Reynolds	317 Mission st
South Utah M Co	Nevada	4	10	Dec 22	Jan 24	Feb 13	W S Hinkle	207 Sansome st
Tioga Con M Co	California	8	20	Nov 26	Dec 31	Jan 21	W H Lent	309 Montgomery st
Trojan M Co	Nevada	12	25	Dec 23	Jan 26	Feb 16	D Wilder	328 Montgomery st
Utah S M Co	Nevada	23	2 00	Dec 18	Jan 21	Feb 9	G C Pratt	309 Montgomery st
Wells Fargo M Co	Nevada	13	10	Nov 17	Jan 2	Jan 21	A Colburn	10 Leidesdorff st
Ward G & S M Co	Nevada	5	40	Dec 10	Jan 16	Feb 5	Jacob Stadtfeld	419 California st
Yellow Jacket S M Co	Nevada	35	1 00	Dec 19	Jan 23	Feb 23	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Ætna M Co	Arizona	1	05	Dec 23	Jan 29	Feb 18	J S Benear	420 Montgomery st
Aurora M Co	California	1	10	Dec 3	Jan 18	P Conklin		28 Sansome st
Black Rock M Co	California	1	03	Dec 16	Jan 20	Feb 24	N T Root	227 Beale st
Cataract & Wide West H M Co	Cal	—	25	Nov 15	Dec 22	Jan 12	Wm B Lake	26½ Kearny st
Eagle G & S M Co	California	1	01	Dec 6	Jan 6	Jan 22	F W Unger	112 Leidesdorff st
Favorite G & S M Co	Nevada	1	01	Dec 6	Jan 7	Jan 23	Julius Peters	121 Sansome st
Gover M & M Co	California	40	10	Dec 24	Feb 2	Mar 1	W O Wilson	402 Front st
Hazard Grav M Co	California	4	03	Dec2	Jan 5	Jan 25	J T McGeoghehan	318 Pine st
Headlight M Co	California	1	15	Dec 4	Jan 17	Feb 12	A W Field	302 Montgomery st
J & K G M Co	California	1	15	Sept 29	Dec 18	Jan 8	W H Lent	309 Montgomery st
Liberty Hill Con M & Water Co	Cal	—	60	Dec 20	Jan 16	—	J W Pew	310 Pine st
Mariposa Land and M Co	California	17	50	Dec 10	Jan 10	Feb 2	L Leavitt	309 Montgomery st
Mayhelle Con M Co	California	4	05	Dec 13	Jan 19	Feb 10	W J Taylor	310 Pine st
Monte Cristo Con G M Co	California	2	10	Dec 22	Jan 26	Feb 20	B Burris	Nevada Block
Morgan M Co	California	5	30	Nov 13	Dec 23	Jan 15	J J Raphael	533 Kearny st
Numa M Co	Nevada	2	02	Oct 23	Dec 22	Jan 12	D Wilder	328 Montgomery st
Quartz Mountain G M Co	California	3	50	Dec 3	Jan 5	Jan 26	E Heatres	729 Montgomery st
Quinn M Co	California	—	25	Nov 15	Dec 19	Jan 7	T J Blakeney	Palace Hotel
Revenue M Co	Nevada	1	50	Nov 26	Dec 29	Jan 23	A J Bunner	411½ California st
Summit G M Co	California	4	30	Nov 17	Dec 22	Jan 12	W H Lent	309 Montgomery st
Telfair M Co	Arizona	1	02	Nov 12	Dec 20	Jan 15	J Pentecost	702 Market st
Tellurium G & S M Co	California	20	10	Dec 3	Jan 7	Jan 29	J M Litchfield	415 Montgomery st
University G M Co	California	4	15	Nov 10	Dec 13	Jan 3	W L Oliver	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
American M Co	—	M E Sperling	309 California st	Annual	Jan 12
Argenta M Co	California	E M Hall	Stock Exchange	Annual	Jan 12
California M Co	Nevada	C P Gordon	309 California st	Annual	Jan 21
Con Virginia M Co	Nevada	A W Havens	Nevada Block	Annual	Jan 8
Eagle C & S M Co	California	W Diter	112 Leidesdorff st	Annual	Jan 5
Eldora G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 6
Gila S M Co	Nevada	W W Parrisb	328 Montgomery st	Annual	Jan 12
Griffith Con M & M Co	Nevada	G M Condee	330 Pine st	Annual	Jan 6
Henrietta Gravel M Co	California	F Klostermann	309 California st	Annual	Jan 9
Idaho G & S M Co	California	Col. Meade	324 Pine st	Annual	Jan 12
Leviathan M Co	Nevada	F A Fenna	330 Pine st	Annual	Jan 12
Lida G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 6
Mastodon G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 6
Nevada Chief G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 6
Northern Light G & S M Co	—	F S Monroe	310 Pine st	Annual	Jan 5
San Xavier M & S Co	Arizona	F A McGee	32 Merchants' Ex	Annual	Jan 8
Silver King M Co	Arizona	E B Booth	320 California st	Annual	Jan 13
South Star G & S M Co	Nevada	J F Atwell	606 Montgomery st	Annual	Jan 6
Union Con M Co, of Cerro Cordo	Cal	T M Converse	402 Front st	Annual	Jan 14

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Bodie Con M Co	California	W H Lent	Nevada Block	50	Jan 2
California M Co	Nevada	C P Gordon	Nevada Block	50	Dec 22
Con Virginia M Co	Nevada	A W Havens	Nevada Block	50	Dec 23
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Dec 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	30	Dec 24
Ophir S M Co	Nevada	C L McCoy	203 Bush st	1 00	Dec 12
Pioneer M Co	California	J W Pew	310 Pine st	08	Oct 5
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Dec 12

Mining Share Market.

The week is a broken one owing to the New Year's Day being a legal holiday and operators appear loth to make any decided movements at the close of 1879. There was a little spurt in the market ou Monday which gave a temporary hope of a rise to the desponding ones who are looking to 1880 as the Mecca of their anticipations of better times. Still the transactions were limited and the market was decidedly mixed. Since then there has been a lack of interest althongh prices have in the main been well sustained, which has been a surprise to those who thought prices would weaken at the last of the year. The fluctuations have been light, no real buoyancy being shown and as the sales have been moderate and in small lots, no one operator has been known to make a grand strike; in fact the loss and gain have been about equal.

The general outlook on the Comstock mines is favorable. Ore is said to have been struck in the 2760 level of the Belcher in the east crosscut; it is small stringer of rich ore, and is considered promising. Connection will be soon made between the header of the Sutro tunnel and the east crosscut of the Gould & Curry and Best & Belcher on the 1700 level. In the Sutro tunnel the headers will each make about 400 feet for December. In the Lady Bryan they are finding hnnches of good ore in the incline below the 750 level.

The extreme cold weather has caused some delay in mining hy causing the hursting of water pipes and hy the general retarding influence of low temperatnre. This has been more especially marked upon the Comstock lodc, hecause the operations are so much more extensive there than elsewhere. It has also had an influence on the shipments of hullion. With the cessation of the cold wave hetter resnlts are anticipated.

We are again this week without onr usual summary of mining news from the Comstock, owing to the fact that we go to press one day earlier than customary, in order to enjoy as a holiday, New Year's day. We have, however, printed extracts from the letters of superintendents of prominent mines.

180 Scorpion	2.70	40 Exchequer	2¾
100 Trojan	3c	125 Enterprise	1¾
40 Union	39¾@39	130 Endowment	70c
25 Utah	8¾	45 Gould & Curry	4.90@4.95
500 W Comstock	15c	30 Hale & Nor	6
60 Yellow Jacket	8¾@8¾	80 Julia	1.95
AFTERNOON SESSION.		195 Justice	1¼@1.55
30 Alta	2¾	30 Mexican	16¾@17
120 Argenta	1.05	30 Ophir	18¾@18¾
400 Atlas	12¾@15c	40 Overman	5¾
30 Belcher	2@2.85	30 Potosi	2.85
20 Benton	1¾	100 Queen Bee	25c
500 Black Hawk	42@45c	30 Savage	5¾@5¾
20 California	4	20 Sierra Nevada	17¼
35 Con Virginia	3.95	100 S Bodie	15c
90 Crown Point	2.55@2¾	100 S Utah	2c
20 Confidence	6¾	20 Union Con	39¼@39¾
20 Chollar	5¾	30 Utah	8¼
120 Caledonia	1.20

An Arizona Gold Yarn.

The Phœnix *Herald* of recent date contains a long account of the reported discovery of placer diggings of immense richness, about 90 miles northeast of Phœuix. Tho news was brought in hy a Mexican, who says that about a month ago he started out with a companion prospecting, going np Salt river. When opposite Superstition mountain, they left the river and began prospecting. While climbing np the mountain in a little gully through black sand, and down which a large stream of water had evidently run years ago, they were astonished to find that in this sand were large quantities of fine gold. In some places the sand was only about half an inch over the granite. The gold, in pieces the size of a bean and smaller, was found in the fissures in the face of the bedrock. Very little washing was necessary, and they found a little spring of water, which furnished them what they needed. They obtained about $600 worth in half a day's work. About two o'clock in the afternoon they were surprised to see an Indian woman come to the top of a gulch abovo the spring and start to como down. Upon seeing them she ran back over the hill. In less than 10 minutes they were surrounded by 50 or 60 savages. The Indians were small, and seemed to be of a different nation than any they had seen in Arizona. The Mexicans were not armed, except with knives, and the Mexican says they were almost instantly canght with lariats. The Indians took them np the mountain and put them in a cave. They tortured and killed his companion, and his fate would have been tho same hut for his escape. He succeeded in getting away with only a few knife gashes in his face. They lost their gold with all their outfit. The Indians seemed to he cavedwellers, and were evidently excited over tho place being found hy outsiders. The Mexican, when he reached town, was a pitiful sight. His hands and feet were torn and hleeding, and his faec was gashed in a fearful manner.

Proposed One-Rail Railroad.

We referred a short time siuce to the locomotive now in process of construction at the Union Iron Works, in this city, for testing the practicability of the James one-rail railroad system, and which will he completed in a few days. The Antioch *Ledger* has the following to say concerning the project: Mr. James will come to Antioch in a few days to superintend the laying of half a milo of track to make the trial test. Rouse, Forman & Co. have agreed to furnish the lumher for laying the ties and rails, and our citizens will no douht donate the lahor necessary to make the experiment. We are also in receipt of a letter from W. H. Worswick, of Grangeville, in Tnlare county, the proposed terminus of the road, stating that a number of gentlemen from that place will come to Antioch as soon as they are informed that the engine and car are completed, to he present at the trial. This is a matter all-important to Antioch if it proves successful, and as the good people of Grangeville have advanced between $2,000 and $3,000 reqnired in building the locomotive and car, our citizens can well afford to aid in laying the half-mile track. A railroad from our water front to Grangeville, a distance of 190 miles through the west San Joaquin valley, would bring a large amount of grain and other farming products to this point for shipment, and he of incalculahle advantage to this section. Warehonses for storing grain would necessarily follow, vessels would come here to receive their cargoes for foreign markets and a foundation wonld he laid for the future growth of onr town. Should the experiment fail, which those having the matter in charge do not helieve possible, it is to he hoped the farmers of the valley will conclnde to hnild a narrow-gauge road.

THE SKAGIT MINES.—Many miners have recently arrived at La Conner, W. T., who report that some prospectors are still arriving at the diggings, but they cannot stay in the mines this winter, as there are no means of subsistence. The new gold field seems to be rich, as in every place where hedrock has been reached, on three different creeks, good pay dirt has been found, and several specimens have been taken out, weighing an ounce or more each. The country is new and unexplored, and all the old miners who have heen there pronounce it an extensive gold region. But there is no use of going there before March next, as there can he nothing done. It has been very difficnlt to get to the mines this season, as the means of traveling was in canoes up the Skagit river, as far as navigable in them, and then clamhering along the cliffs of rock the halance of the way. Many men have heen drowned this fall in trying to stem the current of the river in canoes, as it is very swift. But all of this trouhle is about to he remedied, as a pack-trail through the Hope Pass will soon he completed, and pack-trains will he put on as soon as the spring opens. The route likely to he then traveled, after leaving Seattle, will he hy steamer to Bellingham hay, a distance of eighty miles, and from thence eighty-five miles through Hope Pass to the mines. Wagons can run about fifty miles of this latter distance, and thirty miles on pack animals.

THE Supreme Court has decided that indictments found hy the last Grand Jury against Charles De Young and others are valid, and the indicted parties must stand trial.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MINING SALE.—Amador *Sentinel*, Dec. 24: Daniel Doty sold an undeveloped quartz mine near Amador recently to Morgan & Tozer, of the Butte Basin company, for $1,500.

PLYMOUTH MINES.—Correspondent of the *Sentinel*: Twenty-five mines are now being worked in this county, with prospects of many more within the next year. For example, take the Empire at Plymouth, where mining and milling only costs $3 per ton ($20 on the Comstock), with a 60-ft ledge of $17 ore, thence travel three miles south to the Gover, a mine of like character, but needing, like the Empire, improved machinery. We have only about 450 stamps crushing ore from the Cosumnes river on the north to the Mokelumne on the south, yet there is room for 5,000. Work on the Baldwin mine, near Nashville, is going ahead. On the completion of the present shaft, 300 ft of cross-cutting will be done, and if the present ore-body continues—which is 18 ft wide, with assay at $11.25 per ton—proper hoisting and reduction works will he erected from time to time as may be needed. E. J. Baldwin and party were recently here and secured interests, and five other claims near the mine are now being developed.

NORTH GOVER.—*Ledger*, Dec. 27: At the annual meeting of stockholders, 40,263 shares, out of a total of 60,000 shares, were represented. The following trustees were elected for the ensuing year: John Palmer, ft. M. Ford, A. Weil, f. N. Templeton and H. B. Templeton. The company has just let another contract to Calamori & Co., to extend the tunnel from the Gover, through which it is proposed to prospect the mine, another 100 ft. When this contract is completed, the tunnel will be 54 feet inside the North Oover ground. At present small strata of broken quartz appear in the face of the tunnel.

DOWNS.—The last clean-up just made, from a crushing of 278 tons, yielded a trifle over $25 per ton.

BUTTE BASIN.—At the Butte Basin sinking operations the pumping apparatus is again out of gear, and the water holds undisputed possession of the shaft. A larger pump has been procured, and two professional divers are here to fix it in the shaft when it arrives. The land along Mill creek, ten miles above Volcano, has been extensively located for gravel mining purposes. It is reported that the ground will pay at the rate of $4 per day per man.

CALAVERAS.

QUARTZ MINING.—*Advertiser*, Dec. 25: Quartz mining in this county is looking up, and capital is rushing in as fast as good ledges are developed. The Bonanza mine, located about four miles from Copperopolis, and owned by Andrea Fontana, changed hands on the 22d inst., for the sum of $5,000 cash, to Sidney O. Brown, of San Francisco.

ANOTHER SALE.—*Citizen*, Dec. 20: Hull & Co.'s quartz mine, in El Dorado district, was sold on the 17th inst. to George F. McPherson, of Oakland, for $3,000. This claim has been prospected sufficient to prove that it is a good mine. ft is the intention of Mr. McPherson to immediately commence work.

PRIOR CLAIM.—Charles McGuirk and several others, while prospecting in the vicinity of the County Hospital, struck "pay dirt." Tho young men were congratulating themselves on having a good thing, when other parties dropped down upon them with a prior claim, they having located the same some months ago.

THE CHAMPION.—*Chronicle*, Dec. 27: Messrs. Haskins & Hadler of the Champion mine brought down the hullion resulting from a late clean-up. It weighed 367 ounces, valued at between $6,000 and $7,000. It is but a short time since we recorded a similar "output" of "amalgam" from the Champion—a fact that we refer to simply for the purpose of showing that these $7,000 clean-ups at the Champion come so closo together as to indicate a very healthy condition of the mine.

INYO.

NEW DIGGINGS.—Inyo *Independent*, Dec. 27: N. B. Mikesell writes us from Panamint that himself and others have just made a promising discovery at a point about 20 miles north of Panamint in the same range. They have organized a district there called Breyfogle. It is well supplied with wood, water and grass. From one large lode called hy the same name as the district, a number of assays were made by Smith at Panamint. The "buttons" from three of these assays are now in our possession, and finer or larger ones are rarely seen. These assays foot up respectively $3,879.48, $556.69, and $536.66. We think there is something in this new discovery, and shall be pleased to have fuller reports concerning it.

MARIPOSA.

REB BANKS.—*Gazette*, Dec. 27: This placer claim, on Merced river, has been known and indifferently worked ever since 1849, and, notwithstanding the inefficiency of means and facilities to work the same, it has produced thousands of dollars and is yet barely prospected. Col. Swadley is now actively engaged in improvements with a view to extensive mining there. He has a body of men digging a tail-race about 150 ft long from the river up to the claim, and another force employed repairing the old ditch leading from Scott's gulch about two and a half miles long, which will soon he completed. A full set of hydraulic apparatus, blacksmith and carpenter tools, etc., have been ordered. It is also contemplated taking water from the Benton Dam, about one mile above, and conveying the same by ditch and flume to the claim.

MONO.

PLACER MINES.—Bodie *News*, Dec. 23: The placer mines recently struck near the Dudley receive their supply of water from the Goodshaw, who are constantly raising with pumps from seven to ten inches, miners' measure, of water. This affords a limited supply to work the placers. When the Jupiter pumps get in operation a still further supply will he furnished. It is only a question of time about having plenty of water from the South Noonday, the Red Cloud, Stanford and Defiance to amply supply all demands, when the yield from the placer mines east of the hill will assume large proportions and hundreds of men will have profitable employment in our placer mines.

THE NEW NOONDAY MILL.—Bodie *Free Press*, Dec. 26: The day of starting the mill was reserved for Christmas. Mrs. John Parkham, wife of Superintendent Parkham, blew the steam whistle at 3 P. M. and started the monster engine in the presence of a large number of people. This mill is one of the best appointed on the coast. It has 30 stamps, 24 pans and 12 settlers. ft is run by a Harris Corliss engine of 220-horse power—the same make of engine as was used to run the machinery at the Centennial exposition at Philadelphia in 1876. Mr. J. H. Tosney, an experienced engineer, came out from the East to put up the engine, and is retained as chief engineer. The crushing capacity of the mill is 100 tons per day, and the management apprehend no difficulty in supplying it with that amount. The contractors, Messrs. G. H. Malter and Jas. Mee, commenced grading July 24th. The cost of the work is said to have been about $120,000. Mr. Jas. Mee will remain as Superintendent of the mill.

SPAULDING MILL.—Bodie *News*, Dec. 27: This mill will be finished and crushing rock by Feh. 1st. The mill building is completed and the engine set in place. Six pans are in position and three settlers. The rest of the pans and settlers are on the road.

NOONDAY.—The mine is looking as well as ever and turning out a good quality of ore for the new mill, which started up at 3 o'clock on Christmas afternoon. Everything about the mill is working smoothly.

TIOGA.—Shaft down 721 ft, having heen sunk and timhered 10 ft during the week. The bottom is still in the vein, which is about 12 ft in width, the walls being very regular and hard. The Syudicate drift is in 637 ft—an advance of 14 ft this week. The east crosscut from the Ralston winze has been advanced 12 ft this week, with several small streaks of rich ore in face of the crosscut.

SOUTH NOONDAY.—The ledge passed through at a depth of 70 ft has straightened and is now standing almost vertical, being on the east side of the shaft.

MONO.—Work at this mine is still confined to sinking. The shaft is down 515 ft. The pumps and everything about the mine are working satisfactorily.

SOUTH BELWER.—The new pumping machinery is all on the ground, and will be put in position immediately, so that sinking may be resumed on the 1st of Jan. The sinking of winze No. 1, on 350 level, is progressing favorably, and is down 174 ft. This winze has been carried down on the ledge, which is now four ft wide of good ore. This winze is being sunk for the purpose of connecting with the 550 level, so as to expedite the opening up of the mine and ventilating the lower levels.

BOSTON CON.—The shaft is down 195 ft, and the contractors will finish it to the 200 level early next week, when crosscutting and exploring both veins will be carried forward as speedily as possible.

CON. PACIFIC.—Work in this mine has gone on uninterruptedly the past week. The shaft is down 60 ft below the 400 level, carrying quartz on the east side, the vein going down nearly vertical. The assays from this increases as depth is attained, and without donbt it will add greatly to the value of this property.

RIQUERA.—Crosscutting to the ledge from the 100 level has been commenced, and now in 14 ft from the shaft, with good prospects for cutting the ledge soon.

QUEEN BEE.—East crosscut on 400 level has advanced 14 ft this week, making a total of 70 ft from the shaft. The ground passed through is looking very well, and several strata of quartz have been cut, and appearances indicate that a ledge may be struck within a week or so. Everything about the mine is in good order.

BLACKHAWK.—The shaft is down 540 ft. No change in the rock. Since last report have made 2 ft. East crosscut, bottom of winze, is in 68 ft. There has been some change in the ground, passing through quartz and clay. Everything about the mine is working well.

NEVADA.

MINING BY ELECTRIC LIGHT.—Nevada City *Herald*, Dec. 23: The mine at Mooney flat, formerly owned by the Deer Creek company, is being worked extensively hy its present owners, the Excelsior Con. company. Work is carried on in three sets of claims, operated in rotation, with two large monitors located in each set. While the water is playing in one of the claims, the miners work at drilling, blasting and breaking pipe clay in another. The dirt is very rich, so that gold can he seen plainly in most places in the blue gravel. The outlet is through a bedrock tunnel which dumps into Deer creek. The dump is excellent and will admit of working the entire claim, with no danger from blockade, as each rise of water in Deer creek carries the tailings completely away. At present 45 men are employed, hut the water is made to do most of the work. Operations are carried on both day and night, and the company has lately procured a powerful electric machine at a cost of $1,500, so that the mine is lighted with electric light. The electricity is generated hy friction and the motive power is produced by about 30 inches of water, which is taken from the main water pipe, and after being utilized is returned, so that no waste or loss occurs. The electric current is carried to the point where the light is desired by large-sized copper wires suspended similar to telegraph wires. The current is made to leap a short space from one electric candle to another to complete the circuit; it is this continuous leaping which gives ont the bright light which illuminates the mine, almost equal to sunlight. Other companies intend to introduce this innovation.

COPPER.—At the copper mine, near Spenceville, a new roasting shed 600 ft long has been erected on the hill above the shaft, and another new one is to be built, which will be 300 ft in length. The old shed in the canyon is to be torn down, as from it comes most of the offensive sulphur smoke which settles in the village. The ore at present being taken out is richer in copper than any heretofore extracted.

WASHINGTON MINE.—At the late annual meeting of this mining company, the old Board of Trustees was re-elected. The report of the Secretary shows that the company have accomplished a great deal with the means at their command, the sinking of the shaft being one of the cheapest pieces of work ever performed in the district.

THE YUBA.—*Foothill Tidings*, Dec. 27: Good reports come from the Yuha gold mine, near Washington, the controlling interest in which was recently purchased hy Col. W. K. Rodgers, of Sonoma. The main drift has developed a four-ft vein of good paying quartz, and the progress already made encourages the helief that this chute will prove a continuous and permanent one and of great value.

HYDRAULICS SHUT DOWN.—Nevada City *Transcript*, Dec 27: The recent cold weather has caused the suspension of washing in all the principal hydraulic mines of the county, including the Blue Tent, Sailor Flat, North Bloomfield, Milton, etc. Water was turned out from most of the ditches as soon as the mercury commenced to go down, but where permitted to remain in, an occasional one froze to a solid mass. Even the large Smartsville ditch, which a gentleman, who worked along it for 12 years, says was never before affected in a similar manner, is only open for a few inches along the center, and the water that rushes down is thick with broken ice and snow. It will take a couple of days of warm weather to start the mines again.

NEVADA.

WASHOE DISTRICT.

Reports condensed from official letters from the mines, dated Dec. 27th:

JULIA.—Repairs on 2000 level, south drift, are progressing favorably, and unless some unforseen accident occurs, the face of the south-west crosscut will be reached by the end of the coming week, and prospecting at once commenced. Ventilation throughout the mine has greatly improved within the last week.

WARD.—Shaft has been sunk 19 ft during the past week; total depth, 1,897 ft. Flow of water continues strong, about 135,000 gallons per 24 hours, and a very prominent change has taken place in the general formation, presenting vein material of a promising character.

CHOLLAR.—The Chollar drift west on 2400 level has been run 60 ft during the past week, making total distance from face to shaft 262 ft. The ground has been very hard, and worked badly. It has now become softer and blasts out well; material has been vein porphyry.

SILVER HILL.—During the past week the east crosscut, 1300 level, has been extended and timbered 30 ft. We also started a drift south and timbered it 10 ft, which will be used to switch off the drilling machines. Material passed through is about the same as last week, bird's-eye porphyry; a little increase of water has been encountered in the mine.

OPHIR.—Work was commenced on the west end excavation for pump tank below the 2500 station of the main incline on Thursday last. This work will interfere to some extent with sinking the incline, but will be completed as soon as possible, and the main line of pumps carried down to that point. On the 2500 level the main north drift has been advanced 24 ft, making a total length of 54 ft from the main incline, passing through a heavy vein formation which requires careful timbering, carrying some low-grade ore. On the 2400 level the west crosscut continues in vein formation. On the 2200 level the south drift has been extended 24 ft; total length, 121 ft, and is passing into a vein formation showing some quartz. On the 2100 level the north drift has been advanced 13 ft through milling ore, and is now in 230 ft from crosscut No. 1. The ore stopes continue to yield the usual quantity of good milling ore. The extreme cold weather experienced during the week has interfered somewhat with the work hy freezing up and hursting the water and air pipes, and the formation of ice in the vertical shaft, which interfered with the running of cages.

UNION CON.—On the 2000 level the joint Mexican west crosscut on the southern boundary has been extended 21 ft, and is now in 428 ft from the main north drift, passing out of the hard vein of porphyry into a softer and more kindly formation. The joint Mexican winze has been sunk and timbered 13 ft through a bird's-eye porphyry, carrying some water, and has attained a depth of 258 ft. On the 2300 level the main south drift has been advanced 22 ft, and leaving 154 ft to be run before connecting with the joint Mexican winze level. The material passed through is a bird's-eye porphyry. The drift north from the main shaft reached the Sierra Nevada ore stopes on Thursday last. This connection will enable them to commence the extraction of ore from this level as soon as the Union shaft can handle the material. On the 2400 level they are still extending the sill flour to the south and east. The drift started on a northwest course from the ore stopes has been connected with the west drift run on the north side of the Sierra Nevada incline, passing through and over the fold of porphyry which was supposed to be the west wall of the ore body, and showing high-grade ore on the other side of it, extending to and beyond the northern boundary. They have, during the week, extracted 1,110 tons of ore, of which 712 tons have been shipped to the mill, leaving 664 tons in the ore house. The third shipment of bullion, amounting to $28,173.33, will be made soon. The extreme cold weather has interfered somewhat with milling operations, and made the weekly shipment small.

BRISTOL DISTRICT.

ITEMS.—Pioche *Record*, Dec. 27: The Hillside furnace, which has been newly relined and machinery put in perfect order, will start up Monday, with a large amount of ore on dump. Work on the empel furnace is about completed, and it is expected that the refining of Hillside bullion will commence Jan. 1st. Owing to the bad condition of the quartz road from the Hillside mine to Bristol, only about 35 tons of ore is being shipped daily to the furnace.

COMO DISTRICT.

MINES ABOUT COMO.—Reno *Gazette*, Dec. 20: The Empire looks better than ever. There is no water in the mine. The mine is regarded as sold to San Francisco parties, although there has been no money paid and no transfers made. They have until Jan. 1st to decide. J. B. Shaw has been appointed manager. The North Rapidan is regarded as the second mine in the camp. It is the property of G. W. Keith, Recorder Crowningshield and C. Hobbs, who have leased it, until May 1st, to Schaffer, Lemon and Hamilton. The ledge on which they are at work is very wide. They are already in 35 ft and have not found the footwall. The rock the whole width averages $15 a ton, and is improving rapidly. The Star of the West has been leased for a year to Patridge, who built the tailings mill near Washoe two years ago. The Chieftain is opened 200 ft deep. A drift east is 15 ft of ore worth over $30. The Great Republic has a tunnel 80 ft long, which is crosscutting strings of rich ore. These are the only mines being worked. The South Buckeye folks are ready for business, but are waiting for lumber.

A RESURRECTED CLOCK.—In a deserted drift of the Star of the West mine, at Como, a clock was recently found in a pile of dumpage which had been there since 1864. Being wound up it started running and has run ever since.

GILLIS MOUNTAIN DISTRICT.

MINING NOTES.—Cor. Esmeralda *Herald*, Dec. 27: The Gillis Mountain district is situated about 30 miles north of Belleville. The formation is granite, resembling Austin mines. There are 72 claims recorded; many of which are rich on the surface. It is no uncommon thing to get assays ranging from $1,500 to $2,000 per ton. Sixteen tons worked at the Northern Belle mine, last month, yielded $500 per ton. Mines seem rich, but prospectors are poor and need a custom mill in the district, as ore is now sacked and shipped away. ft does not pay to ship anything less than $200-ore. There is an abundance of wood and water within two and one-half miles of the mines.

PYRAMID DISTRICT.

TO BE WORKED.—Reno *Gazette*, Dec. 20: The Pyramid mining company, organized in San Francisco last fall, with a capital of $50,000,000 in 300,000 shares, have been negotiating for some months with several mine owners at Pyramid, the result of which is that the Buckeye, with 1,500 ft; the Tiger, with 1,500 ft; the South Blaisdell, with 562 ft, and the Clyde, with 188 ft, have been turned over to the new company, who will pay all their debts, and give the owners 60 of the Pyramid company's shares per foot for their ground. The Pyramid company is bound to put up pumps, hoisting works, mills, etc., within a year, or return the ground to its original owners. It is proposed to begin operations at once, and to work the whole ground through the Buckeye shaft, which is down 135 ft.

SILVER STATE DISTRICT.

ORE.—*Silver State*, Dec. 27: James Doolin's 12-mule team left Winnemucca yesterday for Silver State district, loaded with lumber and mining supplies. Mr. Doolin goes to prospect the Florence claim, owned by him and Tom Cain. They intend to bring in a carload of ore for shipment when the team returns. The Florence is located six or eight miles north of Silver Hill, where the Silver Bill and other claims of more or less prominence are situated.

SILVER REEF.—Pioche *Record*, Dec 27: We learn by letter from Silver Reef that Col. Wall has purchased the hoisting works of No. 9—old Pioche mine—for the purpose of placing them on the Kenner mine at the Reef. Barbee & Van Hagen have started to build a new mill, having ordered the machinery from Chicago, which is now on the way there.

ARIZONA.

SPEAKS FOR ITSELF.—*Arizona Sentinel*, Dec. 27: The daily arrival of mill and mining machinery for new plants, and tools, supplies, etc., for those already established is a diurnal attestation to the rapid developments making in Arizona, and they speak louder than the most flattering reports our mining experts and other visitors could make in praise of the Territory as a place for investment.

SILVER KING MINE.—There are facts connected with the management of this property which invite attention, viz.: The mine purchased itself; it has paid in a certain amount of dividends; paid for a thorough systematic opening—not inexpensive either; has given steady and remunerative occupation to a goodly number of miners, mechanics and teamsters; created a thriving village, and established a nucleus for an expansive prosperity, second to none in the Territory; has been a steady and increasing factor to railroad progress since the day that the track reached to within twelve miles of the Colorado; never has asked for an assessment; never bursted a community with its stock; never has been blown over its merit, and stands to-day as a practical result of what can he done by keeping your mouth shut and attending to your own business.

HUACHUCA DISTRICT.—*Arizona Star*, Dec. 25: W. B. Scott has bonded a property in Mormon canyon for $30,000 for four months. A shaft six ft across has been sunk, which is all in ore. The bonding parties are now running a tunnel, and will tap the vein at the depth of 150 ft from the surface.

ABOUT TUCSON.—The Black Metal mine, ten miles west of Tucson, is rapidly developing. At the depth of 22 ft the metal has widened to 18 inches, while at the surface it was two inches. The assay from the top was $812; at the bottom of the shaft it assays $400 in silver, and 40% in copper. The mine is in a porphyry formation, with excellent walls. Mr. Blade, one of the owners, brought in two pieces of ore from the Linda mine on the same ledge. One assayed over $800 and the other nearly $800.

GLOBE DISTRICT.—*Silver Belt*, Dec. 27: The Irene mine has its tunnel in over 100 ft, and is promising well. The mouth of the shaft is situated 250 ft above on the mountain, and the shaft is sunk over 70 ft. It is impossible to approximate the width of the ore vein, but from indications it is safe to say that at the present depth it will reach a width of 25 to 30 ft. We are confirmed in this opinion by Mr. Mark L. McDonald and Hon. J. K. Luttrell, who visited the mine subsequently to our visit.

NEW DISTRICT.—Cor. *Herald*, Dec. 20: There have been some new discoveries made at Pro Heney's camp, better

CONTINUED ON PAGE 12.

A Profitable Gold Mine.

The Idaho Mine, Nevada County.

The Idaho mine of Grass Valley may be taken as a representative quartz mine of California. It has been worked for many years as a legitimate mining operation without any stock-dealing manipulations. The Grass Valley *Union* publishes the report of the officers of the company for the fiscal year, which will show the operations of the mine in detail. The following is the

Superintendent's Report:

To the Stockholders of the Idaho Mining Co.—GENTLEMEN: In accordauce with the by-laws of your company, I herewith submit for your consideration my annual report for the year ending December 1, 1879.

In the year now past but little has occurred to call for special notice. The air shaft from the 400 level was completed early in the summer, and during the hot weather we derived much benefit from this expenditure; but in making this opening from the surface we struck quite a stream of water—eo much that in order to get the shaft through it was necessary to put up a small engine to pump the water. This engine was worked with compressed air from our main compressor. In order to handle this water we have secured a water wheel, which will be driven by our battery water, and it is intended to have it running before the winter rains increase the water in the ground. Also as our workings increase in depth, it was found our boiler capacity for the pumping engine was insufficient, and as we could spare one boiler from the hoisting works, it was decided to remove this boiler to the pumping works. It is now in place, and a new boiler house is erected, with iron roof and sides, for safety against fire. In view of the large amount of machine work required about the works, it was deemed economical to have it done by our own workmen; accordingly a planer and lathe were purchased, and we find many advantages in having the means of doing this work under our own supervision. In order to facilitate the work in the incline and 1100 drift, it was thought advisable to put in an exhaust fan, to draw the powder emoke and bad air from this part of the works. The engine was worked with compressed air, hut as we now have a raise through from the 1000 level, the fan is no longer needed at this point, and it is now used to force air into the 1000-foot drift. During the summer we have added two iron bobs to our pumping works underground—one for a balance at the 700 level, old shaft, and one angle boh at the bottom of the main shaft. From the hottom of the main shaft we are now driving a prospect crosscut in the foot-wall to strike a stringer which went off from the ledge in the 1,000 level, about 350 feet from the ehaft.

During the year the incline from the 1000 level has been continued down 175 feet. At this distance the 1100 level is run off and is now in 188 feet from the incline. The quartz, *as was anticipated*, has beeu of a low grade, until the last 30 feet, since which it has been of fair quality; aud as we had very good quartz in the 1000 level we may expect a further improvement in this drift and the stopes connected therewith. The incline below the 1100 level is again heing sunk and is down 32 feet; hut as we are sinking in the foot-wall and have not yet hroken into the ledge, it is impossible to speak of its size or quality

We are still taking out quartz from the stopes of the 700, 800, 900 and 1000 levels. The ledge in some places is quite small, but as we are uot yet through the pay chute it is hoped it will widen out again to its usual size.

During the year we have crushed 32,370 tons of quartz. Of this 1,225 tons came from the 700 level; 8,937 from the 800 level; 6,718 from the 900 level; 10,302 from the 1000 level; and 5,151 from the 1100 level.

Total yield of 27,160½ ounces of bullion, value.	$477,450.38
Sold 132¼ tons of tailings, sulphurets and slime	4,330.96
Estimated cost working same	2,640.00
Tailings worked on shares	7,747.90
Worked 25 tons buddle sulphurets	1,503.50
Sold 71 tons buddle sulphurets	4,254.81
Estimated cost working same	1,420.00
Sale of specimens	29.00
Total yield from quartz	$490,379.61

Averaging $15.42¾ per ton; average cost of mining and milling per ton, $8.96¼.

In the disposition of our sulphurets I have to report that in two cases we have been unable to collect our money. One lot of 29 tons was sold for $65 per ton uet; this would have given us $1,885, and the other lot of 10 tons, should have yielded us $1,500. Iu both these cases it would he useless for the company to press payment at present.

[The detailed statement of expenditures is summarized, hut the aggregates will he found under the head of recapitulation.]

Secretary's Report.

George W. Hill, Secretary, submits:

RECAPITULATION.

Mill and Mining	$200,090 85
Saving Sulphurets	2,542 50
Grinding Tailings	1,653 05
Moving Boiler	950 30
New Drums for Mill boiler	512 51
New Planer and lathe	559 30
Exhaust Fan	314 88
Iron Bobs	969 06
Air Shaft	5,599 00
Main Incline	7,030 75
Prospect Crosscut	303 00
General Expenses	14,228 44
Total Expenditures	$325,875 84

Respectfully submitted,
EDWARD COLEMAN, Supt.

The Thirteenth Annual Report for the fiscal year ending Dec. 1, 1879. At the commencement of the year just closed, to wit, Dec. 2, 1878, there was in the treasury the sum of $8,502.94. By reference to the books of the company, the several monthly reports of the Superintendent, sustained by proper vouchers duly examined at each stated meeting of the Board of Trustees, the total receipts for the year, from all sources, ending Dec. 1, 1879, amount to the sum of $492,535.21, to which add cash on hand Dec. 2, 1878, $8,502.94, which makes assets for the year of $501,038.15.

The expenses for the year for all purposes, including twelve dividends, amount to	$494,325 84
Assets brought forward	501,038 15
Balance in treasury Dec. 1 '79	$6,712 31

The undersigned respectfully refers the President and stockholders to the Thirteenth Annual report of the Superintendent of the mine, and the report of the Treasurer for detailed statements of the foregoing several summaries and which are made hereunto a part of this report. Before closing this branch of the subject the Secretary deems it not inappropriate to present in epitomized form, the aggregate receipts and expenditures of the company for the past eleven years, that heing the time in which the mine has paid dividends, and, before which only prospecting was done.

Receipts from all sources for the years:

1860	$ 306,038 75
1870	183,450 23
1871	407,301 16
1872	404,035 52
1873	1,010,512 20
1874	659,023 03
1875	509,430 72
1876	573,928 31
1877	525,435 18
1878	500,449 18
1879	501,038 15
Total receipts for 11 years	$5,599,742 43

There has been paid in dividends to the stockholders as follows:

	Div.	Per cent.	Amt.
1869	11	55	$170,500
1870	7	12	31,200
1871	12	75	232,500
1872	11	52½	162,750
1873	12	220	682,000
1874	12	102½	317,750
1875	11	55½	172,050
1876	12	82½	255,750
1877	12	77½	240,250
1878	12	85	263,500
1879	12	54½	168,950

Being for 11 years 124 dividends, aggregating 872½ on the capital stock, and amounting to $2,703,200.

Treaeurer's Report.

John C. Coleman, Treasurer, presents his annual report as Treasurer of the Idaho Quartz mining company for the year ending December 1, 1879:

RECEIPTS.

By cash on hand December 2, 1878	$ 8,502 94
From 27,160½ ounces of bullion	477,450 38
Percentage from tailings and slime	5,356 65
Pan reut	1,653 05
Sulphurets	3,878 31
Sale of specimens	29 00
Sundry receipts	4,157 22
Total receipts	$501,038 15

DISBURSEMENTS.

Paid Superintendent's checks	$325,375 84
Paid 12 Dividends	168,950 00
Total Disbursements	$494,325 84
Balance cash on hand	6,712 31

A NEW ARRANGEMENT.—The Savage mining compauy are arranging to attack their mine from the front. They consider that the time has now come to utilize tbe Combination shaft. in which they have a joint iuterest with the Hale & Norcross and Chollar and Potosi folks. As soon as the west drift now heing run from said shaft on 2400 level shall have reached the proper point the Savage folks will start from it a branch drift, which they will drive to the place where their incline will come down when extended from its present terminus at the 2400 level. It will take three or four months to run the proposed drift, meanwhile the pumps will he taken out of the 2200 level, and the water allowed to have its own way. This will be bad for the Hale & Norcross folks, who have no water to interfere with their operations on their 2200 level, as they cannot handle the water unaided, and do any work. The Hale & Norcross folks will he obliged to adopt the same plan of working as the Savage company, if the latter company carry out their present programme. The plan will certainly effect a great saving to the Savage company, as when the proposed connection is made the water will flow out to the Combination shaft without trouble or expense. The change will throw ahout 90 men out of work in the Savage. The west drift from the 2400 station of the Combination shaft is now out 86 feet, and will soon reach the point from which it is proposed to run hranch drifts to the eeveral miuee, therefore it would probably be a good plan for all to start in on that level, and at once advance explorations in the virgin ground lying at that depth, leaving the ground above to be prospected after it has drained out.—*Virginia Enterprise.*

HENRY BESSEMER, the English inventor, has taken out 160 patents, almost as many as Edison, and one of them, his process of making steel, ranks as one of the most brilliant inventions of the century. It converts pig iron into steel in a few minutes, and has reduoed the price of steel rails per ton from $200 to $30. Ten times as much steel is used in the world now as was nsed prior to 1856.

The Gold Section of Montana.

The Silver Creek Country.

From the letter of a spccial correspondent of the Helena *Independent*, we make the following abstract describing the changes and progress of the Silver Creek country, in Montana: Two short years ago the writer passed up Silver creek and over the divide of the Rocky mountain range to the other side. A little trail, resembling a brown thread laid upon green velvet, wound among the lofty pines and aromatic firs. Here aud there a small, low, log cabin could be seen, the abode of some hardy placer miner or adventurous prospector, who, immured within this mountain fastness, was unconsciously but the advance guard of a teemiug population. The beautiful parks, which occasionally opened out to view, and sloning mountain sides presented to the eye a smooth, unbroken surface yielding no evidence of the presence of man. Neither pick nor shovel in the hands of excited searchers for gold had disturbed the virgin soil. It was as the Creator had left it when He prouounced His work good. But a marvelous change has come over the face of this auriferous section within the last 20 months. The rough trail has become a well-beaten thoroughfare. The rude cabins have in a measure given place to more pretentious dwellings. The once pleasing parks and smooth mountain sides are corrugated with deep cuts and long tunnels, and pierced with shafts and inclines, till they resemble the abandoned encampment of a once besieged army.

The Mines.

The rich, paying lodes in this favored locality are by no means yet numbered. It is a land of bonanzas, and it is safe to say tbat there are a dozen unearthed where one has been found. With one or two exceptions, the lodes discovered are what is generally known as "blind lodes," or, in other words, they show no surface croppings to indicate their presence. The trend or direction of the lodes is, in most instances, southwesterly and northeasterly, with a slight dip or inclination northerly of about 70°. The vein matter varies from 3 to 59 feet in width, the average being not far from 6 feet, inclosed between well-defined, smooth walls of granite. The names of the lodes which have been developed by a ehaft or tunnel at least 50 feet or more in extent, and are known to be mines of a certain market value, are contained in the following list, to wit: Penobscot, Belmont, Whippoorwill, Bluebird, Gloster, Hickey, Mt. Pleasant, Bald Butte, Drum Lumen, Peigan, Green, Peigan No. 2, Boumahon, T. F. Meagher, Mayflower, Black Hawk and Humbug. There are many more well-defined lodes which are staked, recorded and properly represented, but their development is neccssarily slow as they are owned by men who have not the means to work tbem continuously.

The Mille,

Which are solid and well built, and are provided with all the latest improvements, will not begin to meet the demand which will be made upon them in the near future. The following list comprises the names of all that are now huilt, to wit:

Name of Mill.	Stamps.
Penobscot	40
Belmont	20
Cotter & Hickey	10
Whippoorwill	10
Gloster	5
Magyar	5
Total	90

The Gloster has power and evcrytbing in place for a 10-stamp mill. It may be so counted. The gold which is now turned out of these mills amounts to no insignificant sum. When mills are erected of sufficient capacity to handle and work all the ore wbich it is reasonable to suppose may he annually brought to the surface in this splendid quartz eection, their produce will he felt in the money markets of the world. Prominent among the many mines in this Territory to which public attention has been attracted stands

The Penobscot.

This mine is developed by a shaft 250 feet in depth and 2,291 feet of levels. All the levels in the lead are connected each with the other hy winzes, throngh which a constant supply of fresh air is obtained. Firm bodies of ore are seen throughout the mine. Captain Ryan informed me that without running another foot of levels he could stope out ore enough to run the 40-stamp mill for two years. The bottom of the shaft showe a vein of clear, solid quartz, 15 feet in width, between walls as smooth as the cheeks of a maiden.

The output of ore is about 40 tons per day, jnst enough to keep the mill employed. Seventy-five men are worked under ground and 30 men in the mill and on the outside. Everything in and ahout the mill and mine goes on with the regularity of clock-work. The resident officers of the company are as follows: Capt. W. Ryan, general superintendent; Gus. Oberg, mill superintendent; P. McLaughlin, machinist; P. W. Duffield, assayer and civil engineer; J. W. Young, clerk; Jas. Dower and F. Mahoney, foremen of mine.

The Town of Vestel.

This lively little hnrg, within gunehot of the Penobscot ehaft and built upon faith in the mine, consists of two stores, four boarding-houses besides the company's house, five saloons, one shoemaker shop and quite a large number of private residences. One mile and a half below Vestel, on the road to Helena, is the town of Mt. Pleasant. The Cotter & Hickey mill is located at this place. At present it is undergoing repairs and improvements, which change it from a five to a ten-stamp mill. It will start up this week for its winter service. The town consists of one store, one saloon, two boarding-houses, a shoemaker shop, a postoffice and several private residences. A mile aud a balf below is the rustling little town of Belmont. This place consists of two stores and another in course of completion, three boarding-houses, four saloons, three billiard halls, one blacksmith shop, one butcher shop and a score or so of private residences. This place, like Vestel, is the outgrowth of faith—faith in the richness and stability of the many lodes in its immediate vicinity.

The Belmont Mine,

Which is located a short distance above the town, is probably one of the easiest, if not the very easiest, mine to work in the Territory. The trend of the lode is up the steep slope of a mountain, thus affording a fine natural facility for working the mine. Five tunnele on the line of the lead, about equi-distant apart, constitute the development of the mine. Tunnel No. 1 pierces the mountain 600 feet, the end of the tunnel reaching in 438 feet below tunnel No. 5, or the upper tunnel. Tunnel No. 2 is run 325 feet; No. 3, 400 feet; No. 4, 350 feet, and No. 5, 125 feet—in the aggregate 1,700 feet of tunneling. The output of ore is about 22 tons per day, the amount which the 20-etamp mill cruehes. The quartz is taken to the mill on a tramway from tunnel No. 1. Ore chutes conduct the quartz from the upper tunnels to it. The company work 62 men in mine and mill, and Walter McDermott, general superintendent and assayer; D. C. Trent, mill superintendent; M. L. Talon, foreman of mine; Wm. Muth, secretary.

If the 40 etamps at Veetal and the 20 stamps at Belmont can support the number of stores, boarding-houses, saloons, etc., which are uow doing a good business at those places, to what point of prosperity will the Silver Creek district reach when all her mines are developed and mills built to work their ores?

Mammoth District.

A correspondent of the Inyo *Independent* writes from Mammoth, Mono county, as follows:

Business assumes average proportions and a steady gait, although there are not many men here, yet those who are here are constantly at work producing something, and therefore every man has money once a month. Mines, their ups and downs, are multitude iu this region, and aside from the Mammoth and Headlight, they have a few more downs than otherwise; and here allow me to state that until these mines pass from the hands of the present owners and manipulatore the town is a failure, for be it known that not a mine, with the exception of the Mammotb, Headlight and Monte Cristo, is operated or manipulated on anything like legitimate principles. Although there are many other mines here which prospect about as well as the last mentioned, yet the owners are men who would rather lose an eye than unhook one dollar for prospecting. The Mammoth mine, which is destined within the next twelve months to gain a world-wide fame, never looked better thau at present, and if the present efficient Superintendent, Mr. Hardy, remains at the helm, the euterprise is an inevitable success. The Headlight and Monte Cristo joint tunnel, which is also superintended hy Mr. Hardy, has an air compressor at its mouth, receiving its regular rations of compressed air and steel from the Burleigh and Ingersoll drills, and before old Sol's vernal rays assert their rights in this region, there will be a tunnel into Mineral hill from the weet side, a distance of 900 feet, cutting through the north end of the Crescent mine, and uniting the Headlight and Monte Cristo at their junction, and at a depth of about 800 feet from the croppings thereof.

THE INFLUENCE OF THE HEAT OF THE INTERIOR OF THE EARTH.—Dr. F. M. Stapf, in the *Revue Universelle des Mines*, proposes the following questions: 1. At what degree of temperature will underground work he rendered impossihle on physiological grounds? 2. At what depth of a tunnel helow the surface may the occurrence of such a temperature he expected? After consulting Prof. Duhois Reymond, aud instituting experiments at his recommendation in the St. Gothard tunnel, the conclusion is drawn that it is possihle to work for a short time at 60° C. in a dry atmosphere, but that, if the air is saturated with moisture, 40° C. is the limit. The author considers that the products of the explosion of dynamite in mines may include nitric acid and carhonic oxide. Particles of nitro-glycerine are also held in suspension in the smoke, and occasion headache, indigestion, and other distressing symptoms. The eecond question will he discussed in a continuation of this paper.

A COLORADO ENTERPRISE.—From the Denver *Tribune* we learn that an important enterprise has heen estahlished there to he known as "the Great Western mining agency and hureau of general and special information." It is conducted by General Frank Hall, formerly Governor of the Territory, and for thirteen years editor of the Central City *Mining Register*, and hy Prof. J. Alden Smith, State Geologist.

Traps for the Unwary.

Now and then in every rural neighborhood there is a man who tires of the round of labor on the farm, and having secured a few hundred, or a few thousand dollars surplus, decides to come to the city and try to get into some "little business," thinking thereby to live an easier and, perchance, a livelier life. In all cities there are classes of sharpers who live upon what they can make out of these small capitalists from the country. There are the coarse operators who rely upon garroting their victims and extracting their money at a jerk. There is another class which trusts to a little finer practice, and relies upon lures to games of chance, and there is still another class which approaches nearest to respectability, and they operate by acting as friends, who can secure just the "little business chance" which the new-comer desires. They advertise openings in all kinds of business, from beer saloons to book-stores, and from blacksmith shops to iron foundries. For a certain sum of money they can buy partnerships in such concerns for their patrons. They will sell *anything* you can name, and often before the purchaser gets much older, he learns that he has bought *nothing* at a very high price.

Such has been the experience of many rural investors in Eastern cities, and many are the accounts of robbed and swindled people recorded in the papers. We were not aware that such was also the character of some of the "agencies" which operate in this city; but if a writer in the Vallejo *Chronicle* speaks the truth, San Francisco is well furnished with traps to catch the man who wants to get into "some little business." This writer, who styles himself "A Victim," tells of going to an "agency" and inquiring about an advertised "opening" in a machine shop. Under the pilotage of the agent, he goes to examine the opening. "Victim" gives the following account of the visit:

> Arrived at a dilapidated building among the iron foundries in the southeastern part of the city, the victim is conducted into a "shop," where three or four men (hired for the occasion) are at work, steam up, and everything presenting a scene of bustle and activity. There is no denying the fact that it looks business like, and is easily calculated to impress any one with a sense of confidence. The "proprietor" (generally an uncouth-looking, illiterate mechanic, in collusion with the agent, of course,) presents himself, with sleeves rolled up, dirty, smoke-begrimed visage, and pants and overshirt shining with the oil and dust of the shop (the result, doubtless, of years of wear, but not by their present occupant), and is introduced by the swindler to the victim. The agent, by a series of winks and signs, conveys to the hard-working mechanic that this is a good bite, but says, "this gentleman has an idea of buying in with you and would like a little information." (I must here say this "business" had all been pre-arranged between the "mechanic" and the swindler, and it is only during certain hours in the day that victims must be brought to the shop, for coal is dear, and it is quite expensive to keep two or three large wheels going all day, particularly when victims are scarce.) The "swindler" now leaves the victim to the tender mercies of the "mechanic," who, in his ingenious manner, begins a story of his business and its fine prospects, and for the truth of his assertions, he will allow Mr. Victim to converse with the workmen. If Mr. V. is not very gullible he generally takes advantage of the offer, interviews the "soot-covered gentlemen" and finds the "mechanic's" statement verified in every essential. A dirty cash-book is shown, with totals invariably large on the debit side, which at once assures the victim of the profitableness of the business. This book has been prepared for the occasion and the entries are false. A dingy order book, also prepared, lies beside it, in which a multiplicity of hastily-written orders have been entered, the chirography purposely made almost indistinguishable, so as to give a sort of "rough-and-tumble honesty" to it. Every device which a rascally brain can conceive is brought to bear upon the victim, who, after apparently satisfying himself that everything is as represented, pays his money, partnership papers in due form are drawn up and signed, and Mr. Victim is now a full-fledged partner in the manufacturing firm of "Mechanic, Victim & Co."
>
> But a few days elapse before the victim discovers the business suddenly dwindle, and the worthless nature of the whole thing appears by degrees, the victim leaves in disgust, and Mr. Mechanic is once more in possession. As soon as he is effectually rid of his victim, he returns to his agent, who places another advertisement in the paper, and the operation is repeated. Sometimes the swindlers run across an obstinate customer, and to prevent exposure they compromise with him. But as a general thing they are successful in the "freeze-out" game.

We give this alleged experience of "Victim" at length in order that readers may see with what ingenuity and elaboration such snares for unwary people are laid. Although it is rather sad to reflect that suspicion must always play such a part in our thoughts, still in all matters of dealing with strangers, whose interest lies plainly in producing a good impression, it is well to exercise the closest scrutiny and seek indisputable proof of the truth of their representations. Those who are unused to city ways must be more on their guard against misrepresentations than those whom contact with many people gives standards of judging. Our advice to all our readers is to proceed with the utmost caution, and run the risk of appearing very stupid rather than seize, with what may appear like business-like celerity, bargains which are the snares arranged by unprincipled and designing men.

HEAVY SALE.—An important mining sale was consummated at Helena on Friday last, the Bonanza Chief and Comet being the properties transferred, and the Alta-Montana company being the purchasers. The consideration for the Bonanza Chief is stated to be $30,000, which amount was on Friday deposited to the credit of the selling parties at the First National bank of Helena. The price paid for the Comet, which is a silver mine, is not known, though $40,000 was deposited on account.—*Butte (Montana) Miner.*

DURING 1878 more than 17,000,000 pounds of pork were imported into Bremen from the United States.

Useful Information.

HINTS CONCERNING SAWS.—A saw just large enough to cut through a board will require less power than a saw larger, the number of teeth, speed and thickness being equal in each. The more teeth, the more power, provided the thickness, speed and feed are equal. There is, however, a limit, or a point where a few teeth will not answer the place of a large number. The thinner the saw, the more teeth will be required to carry an equal amount of feed to each revolution of the saw, but always at the expense of power. When bench saws are used, and the sawing is done by a gauge, the lumber is often inclined to clatter and raise up the back of the saw, when pushed hard. The reason is that the back half of the saw, having an upward motion, has a tendency to lift and raise the piece being sawn, especially when it springs and pinches on the saw, or crowds between the saw and the gauge, while the cut at the front of the saw has the opposite tendency of holding that part of the piece down. The hook or pitch of a saw-tooth should be on a line from one-quarter to one-fifth the diameter of the saw; a one-quarter pitch is mostly used for hard, and a one-fifth for softer timber. For very fine-toothed saws designed for heavy work, such as sawing shingles, etc., even from soft wood, one-quarter pitch is best.

IRON AND GLUE IN STREET DUST.—In this country we have assays of street dust yielding gold in some towns, but glue and iron we have not searched for. Signor Parnetti has been engaged in analyzing the dust and *debris* of the streets of Florence and Paris. His investigation of the *debris* of the horse paths proves that the dust contains 35% of iron, given by the shoes of the horses to the stones. In the dust from the causeways this eminent chemist finds from 30% to 40% of good glue. Signor Parnetti selected and treated separately the dust from the causeways of the Boulevard des Italiens over a period of two months, which uniformly gave 30% of good transparent glue, it is said quite equal to Belfast. This eminent chemist is now engaged in the analysis of the dust and *debris* deposited by the shoe abrasions in Lombard street, Cornhill, Cheapside, and other thoroughfares of London, and has it in contemplation to place his discoveries at the disposal of a limited company, with a view of establishing blast furnaces on the banks of the Thames to recover the iron thus lost, and a large glue works, which, it is thought will produce more glue from the wasted material than will supply all London for every purpose.

VEGETABLE FIBER VS. HAIR FOR MORTAR.—Vegetable fiber is now successfully substituted, it is said, for hair in the composition of plaster for building purposes. The advantages claimed for it are as follows: First, being of a woody nature, instead of being destroyed when put in the lime, it is preserved, lime being a preserver of wood; second, it is light and bulky, so that one pound, costing but a small sum, is sufficient for a barrel of browning, and two pounds for a barrel of lime scratch coat; third, it is much stronger than hair, is very light, clean and entirely free from foreign substances; fourth, it mixes more easily and freely with the plaster than is the case with hair, and also spreads more uniformly through the same. This being the case, the new fiber is greatly superior to the ordinary animal hair, the latter, as is well known, usually containing some 30% of its weight in impurities—as lime and scrapings of hides—while the hair itself, by the caustic action of the quick-lime used in removing it from the hides, loses much of its original strength.

SOME German and Russian rail mills employ an ingenious method to overcome difficulty in cutting red or nearly white-hot rails, so that they may be all the same length when cold. The rails are looked at through a dark glass; when they have cooled to a certain temperature they cannot be perceived. If a dark blue or an orange-yellow glass is used, the rails may still be at a red glow, but the light radiated from them does not reach the eye. It may be considered that the light from two rails observed through the same dark glass disappears at the same temperature, and thus a rule is obtained for cutting the rails to the same gauge. Each rail is allowed to cool till it can no longer be seen through the dark glass, and is then cut. The result is said to be satisfactory.

TO PROTECT IRON FROM RUST.—Iron can be protected from rust and made very pleasing in color by a method invented by Mr. Dode. He coats the surface with a thin film of borate of lead, in which some oxide of copper has been dissolved, and some scales of platinum held in suspension, by means of a brush or bath. He then heats the composition until it is diffused. The result is a thin, glassy coating, which will withstand the action of sewer gases, dilute acids or alkalies, and the heat of kitchen fire. If all he true that is said of this "platinized iron," as it is called, it will find numerous applications. —*Rev. of Sci. and Ind.*

ENGLISH manufacturers, it is said, have succeeded in producing a new cloth from the hair of the vicuna or South American lama. The cloth is called camelina vicuna. It is made in all the new colors, and also in ivory, but the latter hue is different from all other white goods, in consequence of the introduction of the black hairs that appear in vicuna wool.

THE STRENGTH OF WHEELS.—"I wonder," said a veteran wheelwright, the other day, "how many who see sleader wheels flying over the road stones, or a massive wheel slowly drawing a mass of iron or stone along the cobbles stones, ever pause to think what a perfect piece of mechanism a wheel must be to stand such continuous wear and tear. Every spoke must have a perfect bearing, both at the hub and on the felloe, lie exactly on the same plane as the others, and be of equally well-seasoned timber. The felloes must be an equally good fit at the joints and upon the spokes. They must form at the circumference a perfect circle, and be strong enough for their duty without being too heavy. I tell you that a ton weight continually thumping at a wheel will soon flatten out the weak spots, and bad-fitting and insufficiently-seasoned timber will soon give a loose tire, boys."

THE ANTIQUITY OF FORKS.—The proverb that fingers were made before forks used to be sometimes quoted in connection with the alleged very modern origin of that useful implement. But forks, if not so old as fingers, are now ascertained to date a long way back—as far as the prehistoric era of our race. They have lately been found, formed of bone, and evidently for table use, in the *debris* from ancient lake dwellings, while spoons, which for many purposes forks have superseded, are of still greater antiquity.

GUN barrels of superior quality are made out of the stub iron obtained from old horse-shoe nails. The stubs, after having been freed from all rust and dirt by being brightened in a tumbling-box, are combined with from 12% to 50% of steel in blocks of the same size as the stubs. The combined metals are puddled, hammered, heated, tilted and rolled into ribbons, to be wound in coils around mandrels, heated to a welding heat, and finished by a hammer on the anvil.

Good Health.

Poisons and Their Antidotes.

Reliable statistics, running for many years, and extending over large areas, show that accidents from poisons are of much more frequent occurrence now than formerly. This fact is no doubt due to the much more general use of poisons at present than in years past, both in ordinary household matters and in the arts.

While in all cases of poisoning the chief reliance must be placed upon medical aid, yet it often occurs that the need for a remedy is urgent, so that others should know the most ready and available methods of relief. There are some general instructions which, in the absence of direct antidotes, will apply to most poisons, and the New York *Independent* has done a good work in preparing and publishing the following quite full directions of how to act in cases of emergency, or while waiting for a physician:

Many poisons do their harm by their immediate action upon the esophagus and the coats of the stomach. Hence, if any liquid or soft solid substance is soon swallowed, it tends to diminish the effect. To this end liquids, such as water or milk, may be freely given. Oils also have a protective agency, and these diminish the virulence, especially of the acrid poisons.

It is also a safe indication to remove from the stomach by means of emetics the substance which has been swallowed. A teaspoonful of mustard in a tea-cup of warm water is generally nearest at hand, and may be given to an adult, or half the quantity to a child, every ten minutes until vomiting is excited. A half teaspoonful of powdered ipecac, given in the same way, will act as well. Tickling the throat with a finger or a feather five minutes after the emetic has been given, is likely to hasten its effect. They may well be aided in their action, as well as the stomach protected, by the use of flaxseed, or slippery-elm tea, or eggs, or jelly, or a teaspoonful of melted butter, or lard, or molasses. Whenever the poison is one producing stupor, cold to the head, warmth to the extremities, rubbing the skin with a flesh-brush, and attempts to rouse the person by alternate warm and cold sprinklings may be tried.

Better than all, the chemical antidote should be given, if known. Where an acid has been swallowed, soda, saleratus, lime, magnesia, or prepared chalk should be mixed with water and given in frequent doses. Of these the best is the calcined magnesia, given freely. If an alkali has been swallowed, as a lump of potash or lime, then acids, as vinegar, cider, lemon-juice, and the like, are indicated; but the use of oily and mucilaginous drinks must not be omitted. In poisoning with copper and its compounds, vinegar must be carefully avoided. The recent cases of pie-poisoning in New York city were probably owing to the action of some acid upon a copper kettle, or on copper in some other form.

Oxalic acid, used for cleaning metals, is sometimes taken by mistake for Epsom salts. Chalk, whiting, or other alkali should be freely used before any attempt to excite vomiting.

Prussic acid, although called an acid, is feebly so, and kills by its direct poisonous power over the nerves of organic life. The concentrated juice of peach leaves and kernels, of laurel, etc., may affect in the same way. Hartshorn, alternate cold and warm effusive stimulants to the surface and internally are more important than any other means. Artificial respiration, the same as directed for drowned persons, may be required. Smith's antidote of a half teaspoonful of pearlash, followed by 10 grains of copperas in water, is of service where you are sure as to the acid having been taken.

Sugar of lead and other salts of lead are best neutralized by white of eggs, Epsom salts, and lemonade.

When blue vitriol, or verdigris, has been taken, white of eggs, paste of wheat flour and flaxseed tea, sweetened with sugar, are indicated.

When green or white vitriol, or litharge, or yellow ocher have been swallowed, chalk and flaxseed tea are of service. If lunar caustic has been swallowed, a cupful of salt and water is the antidote.

Phosphorus, as used for poison of vermin and for matches, is sometimes eaten by children. Magnesia or other alkali, with water or mucilaginous drinks, are the readiest means of relief.

Creosote or an overdose of carbolic acid is to be met by white of eggs, milk and wheat-flour paste.

For poisons of the narcotic kind, such as opium, aconite, belladonna, henbane, digitalis and tobacco, there is not at hand any antidote. Stimulating emetics, stimulants to the surface, and, if need be, artificial respiration are indicated. Heavy draughts of strong coffee help to postpone the narcotism of opium. Lemonade or other mild acids are deemed of some service.

Overdoses of camphor or chloroform are an indication for alcoholic stimulants. We are still without certain antidotes for several of the narcotics.

Arsenic, either in its metallic form as gray fly-powder or the white arsenious acid, has an antidote in the hydrated peroxide of iron. Until this can be secured, warm water, milk, plenty of eggs, and lime water must be our reliance. The most frequent mistake of vegetable foods are the substitution of other varieties for the edible mushroom and the use of poke root (*Phytolacca decandra*) for horse-radish. No antidotes are known. But the indication is to use mustard or other stimulating emetics, and prevent further trouble by a few drops of laudanum, frequently repeated, until pain or sickness abates.

These are merely directions for those sudden cases of emergency which may occur in any family, and which, in the country, at least, occur when the physician is not within ready reach. With the use of disinfectants, insect remedies, Paris green (arsenic), and with the increasing familiarity of the people with various chemicals, public health requires great care as to labeling all such articles. The medicines left over from physicians' prescriptions should either be marked or thrown away. Teach those under your control not to eat any vegetable or leaf without knowing what it is. All flowers with the cups turned downward or hooded, and all stalks which exude a milk-white juice when broken, are to be regarded as poisonous. All paints, whether of oil or water colors, should not be held in the mouth. It behooves all householders to have a special place for keeping all extra hazardous or doubtful compounds, and to cast away all unmarked or unneeded bottles and packages.

DISINFECTANTS. — The National Board of Health, in its circular on "Disinfectants and How to Use Them," makes a clear distinction between disinfectants and deodorizers, and disseminates the wholesome truth that "disinfection can not compensate for want of cleanliness or of ventilation." The recommendations of the board as to the disinfectants to be employed are as follows: For fumigation (that is, the purification of an infected atmosphere), roll-sulphur; for sewers, cess-pools, and the like, sulphate of iron (copperas), dissolved in water in the proportion of 1½ pounds to the gallon; for clothing, bed-linen, etc., sulphate of zinc and common salt in the proportion of 4 ounces sulphate and 2 ounces salt to the gallon. The interaction of these two compounds doubtless results more or less promptly in the formation of sulphate of sodium and chloride of zinc, which last is recognized as being the most energetic of the mineral disinfectants. The recommendation of the board to employ the zinc compound in the form of sulphate (with salt), instead of applying the chloride of zinc directly, may perhaps be explained on the ground that the sulphate of zinc is a stable salt that remains in solid form, and may be exposed to the atmosphere without change; whereas the chloride of zinc can not be preserved in solid form save in hermetically-sealed vessels, having such a powerful avidity for moisture that it rapidly liquefies by abstraction of moisture from the air. This property renders zinc chloride inconvenient to handle. By its indirect production after the recipe of the board, this objection is overcome. The board does not recommend carbolic acid for general use, for the reasons that the quality of the commercial article varies greatly, that it is difficult to determine its quality, that it must be used in comparatively large quantity to be serviceable, and that it is liable, by its strong odor, to give a false sense of security.

THE *Chemiker Zeitung* is authority for the announcement that the German Imperial Department of Public Health is about instituting measures for the repression of secret and proprietary remedies; and that in Switzerland the sale of patent and secret medicines is about to be submitted to very stringent regulations.

MINING AND SCIENTIFIC PRESS

W. B. EWER.....SENIOR EDITOR.

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The Week.

To us, the event of the week is the commencement of a new volume of the MINING AND SCIENTIFIC PRESS. We begin to-day—Number 1, Volume XL.—a volume which we propose shall *excel* all previous ones. In view of our age we may be pardoned the pun, especially as we shall not have another chance to make this particular one.

The coldness of the weather continues to be the uppermost topic. The cold spell has been the most severe ever experienced in this immediate vicinity. Heavy frosts and ice are unusual accompaniments of San Francisco winters, although in the interior of the State in the mountains they are common enough. Localities not heretofore visited have, however, had their share this time.

The ice and snow has had the effect of retarding mining operations materially, especially in that class of mines which depend on water. The hydraulic and placer claims are for the time shut down, or rather frozen up, and work has had to be suspended. Many quartz mining operations have also had work delayed.

The terrible disaster to the railway train while crossing the Frith of Tay in Scotland by which many lives were lost, forcibly calls the attention of the public to the question of construction of iron bridges. This bridge, considered a marvel of strength, has fallen within two years of its completion, and hurled to destruction a train full of people. So disastrous an accident has not occurred for a long time.

Before this issue of the PRESS reaches its readers, the New Year will have commenced, and although it may be somewhat late, our wishes to each and all a Happy New Year, will be none the less hearty.

A NUMBER of miners left Seattle this week for the Skagit gold mines, including several direct from Leadville, Colorado.

The Bullion Yield of 1879.

Seventy-three Millions for the Year.

We are indebted to Mr. John J. Valentine for an advance copy of Wells, Fargo & Co.'s circular concerning the bullion yield of 1879, from which we make the following extracts.

The annual statement shows the amount of precious metals produced in the States and Territories west of the Missouri river, including British Columbia (and receipts in San Francisco by express from the west coast of Mexico) during 1879, which shows aggregate products as follows: Gold, $32,539,920; silver, $38,623,812; lead, $4,185,769. Total gross result, $75,349,501; being less by $5,805,121 than for 1878.

The statement is as follows:

California	$18,190,973
Nevada	21,999,714
Oregon	1,037,981
Washington	85,336
Idaho	2,091,300
Montana	3,629,020
Utah	5,468,879
Colorado	14,413,515
New Mexico	6 2,800
Arizona	1,942,403
Dakota	3,203,387
Mexico (West Coast)	1,633,871
British Columbia	976,742
Total	$75,349,501

California shows a decrease in gold of $140,342, and in silver of $589,146—a net decrease of $729,488. Nevada shows a total falling off of $13,184,235, the yield from the Comstock being only $8,830,562, as against $24,295,043 for 1878—a decrease of $12,464,481 from that locality. The product of Eureka district is $5,859,261, as against $6,981,406 for 1878—a decrease of $1,122,145. Utah shows a falling off of $595,734. Colorado shows an increase of over $8,000,000, chiefly from Leadville district. It has been exceedingly difficult to arrive at the actual production of Leadville, the two most reliable reports varying more than $2,000,000. We have adopted an average based upon the conflicting figures. Dakota shows an increase of $993,183.

The bullion from the Comstock Lode contains 41 20-100% gold, and 58 80-100% silver. Of the so-called base bullion from Nevada, 27% was gold, and of the whole product of the State, 27 50-100% was gold.

The gross yield for 1879, shown above, segregated, is approximately as follows:

Gold	43 20-100%	$32,539,920
Silver	50 25-100%	38,623,812
Lead	5 55-100%	4,185,769
Total		$75,349,501

The outlook for 1880 does not indicate a greater product than for 1879.

Annual products of lead, silver and gold in the States and Territories west of the Missouri river, 1870-79:

Year.	Products as per W. F. & Co.'s statements, including amounts British Columbia and West Coast of Mexico.	Products after deducting amounts from British Columbia and West Coast of Mexico.
1870	$54,000,000	$52,150,000
1871	58,284,000	55,784,000
1872	62,236,959	60,351,824
1873	72,258,633	70,139,860
1874	74,401,145	71,965,610
1875	80,833,057	76,703,433
1876	90,875,173	87,219,859
1877	98,421,754	95,811,582
1878	81,154,622	78,276,167
1879	75,349,501	72,683,868

The net product of the States and Territories west of the Missouri river, exclusive of British Columbia and the west coast of Mexico, divided, is as follows:

	Lead.	Silver.	Gold.
1870	$1,080,000	$17,320,000	$33,750,000
1871	2,100,000	19,296,000	34,358,000
1872	2,250,000	13,924,429	38,177,395
1873	3,450,000	27,483,302	39,206,558
1874	3,800,000	29,699,122	38,466,488
1875	5,100,000	31,636,233	39,968,194
1876	5,040,000	39,292,924	42,836,935
1877	5,085,250	45,846,109	44,880,223
1878	3,452,000	37,248,137	37,576,030
1879	4,185,769	37,032,857	31,470,262

The exports of silver during the present year to Japan, China, India, the Straits, etc., have been as follows: From Southampton, $33,000,000; Marseilles and Venice, $5,000,000; San Francisco, $8,000,000. Total, $46,000,000, as against $39,000,000 from the same places in 1878.

The State Legislature.

We give on another page of this issue the names of the executive, judiciary and legislative officers of California who in a few days will take the reins of the State Government in their hands. After the careful sifting of candidates and character during the recent exciting political campaign, it seems as if those selected ought to prove faithful to their trusts.

Under the workings of the new Constitution of the State, the details of which these gentlemen are expected to see properly carried out, doubtless many perplexing questions will arise. Indeed they have no easy task before them in this alone, and the coming session of the Legislature will be a very important one.

In all those questions touching the welfare of the industrial classes of the State, particularly miners and mechanics whose ally we have been so many years, we propose a free discussion. Those of our readers who have the interests of their class at heart will be perfectly welcome to the use of our columns in discussing any questions which may arise affecting them.

Whatever measures may be proposed before the Legislature affecting the interests we represent, we shall promptly report to our readers and comment on freely. The expressions of our correspondents on these measures will without doubt be of value to the members of the Legislature who are in favor of general advancement rather than that of individuals.

Proportionate Wages in Mining.

The Scotch mine owners are mooting the feasibility of adopting a sliding scale of wages to their employees, to be based upon the market value of the products of the mines. As the prosperity of the owners is dependent upon the price of those products, over which they have no control, and as the permanency of the work of the miners is dependent upon the profitable returns from the mine to the owners, it follows as a natural sequence that when prices are low the wages of the men should contract in the same ratio; and to have an equitable hearing to both parties, when the prices advance the wages should also appreciate.

The chief difficulty in the way appears to be in arriving at a just and equitable root-basis, as the initial point of the scale. In the coal and iron mines a certain grade of the former, and a certain class of iron, might from their medium position in the trade be taken as the zero of price in the adjustment. In copper or lead mining the ingot, or pig of pure metal, would be the only positive form in which the market value would or could be based. There would be no other or medium grade which would allow of an average starting point being placed upon it. The fluctuations are from one point only. Copper, for instance, has within the last six months advanced over 40% in price; the fluctuations in lead and silver have not been as great, though they have been sufficient to warrant a marked difference in the profits of their respective mines. The owners of the copper mines, under the advance in copper, could well afford to increase the wages of the miners, if their ores were all uniform in value. But where the ores vary, as in copper, from 5% to over 60% of metal, the question becomes more complicated, and the equity is harder to be met.

If a fair starting point could be fixed, the advantages to the employers and employees would be better than they now are under the arbitrary and set prices for mining labor. The employers would not be subjected to the demands above a profitable rate to themselves by the workmen, when there should be an undue supply of labor. They would be able in all cases to meet a decline in the market prices, knowing that a proportionate decrease in the cost of production would be attendant upon it. This system would be the exterminator of the greatest evil incident to the labor problem, as it would remove all cause of strikes by the workingmen.

The employees would derive the advantage of a rise in the market price; they would not be subjected to the depression in the rate of wages arising from an over-supply of labor; nor would they be liable, as they now are, to be turned out of employment by the fall in the market of the price of the metal they were turning out.

It would operate to the mutual advantage of each, inasmuch as it would create a better and more harmonious feeling between both, than can possibly exist under the present arrangement. It would establish an identity of interest between them, and being founded upon justice and equal rights, it could not fail being successful.

The fewer obstructions or incumbrances that are inflicted upon mining operations, the better it will be for all parties in the transaction of the enterprise. Under this view this question of proportionate wages will have to be very long given a due amount of consideration.

The Railway Disaster.

The whole country was shocked this week on hearing of the terrible disaster which occurred at the Tay bridge, in Scotland, where many lives were lost. How many is not definitely determined. During a very heavy gale or hurricane the train in crossing was precipitated for eighty-eight feet into the river. Whether the central portion of the bridge had fallen before the train arrived, or whether the super-added weight of the train caused the breakage of the bridge, is a matter of conjecture. No one was saved to tell the details.

The Tay bridge is the largest iron bridge in the world and has been considered one of the most important engineering works in England. It crossed the Frith of Tay, and was 10,320 feet long. The bridge comprised 89 spans, 14 of the spans, over the navigable portion of the river, being 200 feet each and giving a clear headway of 88 feet above high water. It was at this point that the bridge gave way.

The magnitude of the bridge, and the novelty and ingenuity of the means employed in its erection, gave it rank with the most interesting civil engineering works ever carried to completion. This disaster, however, will call more direct attention to the details of its construction, the defects of which will now have to be carefully studied. Another large bridge of the same general character is now in course of construction, but it is highly probable work on this will be discontinued, pending investigation of the defects of the other.

The accident will tend to call the attention of engineers all over the country to the problems of railway bridge construction, a question in which the public is directly interested. We shall, next week, give the details of construction of this bridge more fully.

A New Volume.

The head lines of the PRESS for this week are changed to "No. 1, Vol. XL." In so young a country as this is, comparatively, a newspaper which has reached its fortieth volume is quite an old one. Indeed, in the particular field which the PRESS fills, it is the oldest paper on the coast. The first number of this journal was issued in May, 1860, and it has ever since been devoted to science, art, manufactures, mining and inventions.

With the increased attention now being paid to the mining interests of the United States, and especially those on this coast, the mining industry will undoubtedly have its importance more generally recognized. We shall continue to furnish such information to our readers concerning mining and metallurgical operations and improvements as will be useful to them, and this increased activity will enable us to do even more than heretofore.

There are no miners or mechanics on this coast who can afford to be without the PRESS as a weekly visitor to their cabins or shops. We hope, therefore, with the better times now dawning upon us that all those who are able will assist us with their subscription. We are always glad moreover, to receive correspondence and suggestions from practical men, and hope our readers will remember us in this respect also.

We intend this year to make many improvements in the PRESS. We have in contemplation several series of articles connected with metallurgical operations, which will be written by gentlemen of practical experience in their particular lines. These, with others we have in preparation, will make up more than usually interesting numbers, which will be useful for reference to all interested in mining or metallurgical operations.

Fraudulent Entry of Mineral Lands.

Some time last August a petition was sent from Auburn, Placer county, in this State, signed by a number of miners, to the Secretary of the Interior, reciting that it had been and is the practice of a certain class, to claim land as agricultural, and conceal from the land officers its mineral character, obtain title, and then sell and hand the same to be worked for minerals. It also referred to the Central Pacific Railroad Company as being in the practice of issuing citations for hearings to disprove the *prima facia* mineral character of odd sections within its grant, and, at the hearing abandoning such portions as are claimed by miners as minerals, and after a few months again citing the miners to another hearing concerning the same land. The petition asked that when land is once determined or conceded to be mineral, it shall forever be deemed and held as such.

The Acting Commissioner of the General Land Office has sent the following answer, which is published in *Copp's Land Owner*:

"In the matter of fraudulent proceedings under agricultural claims, to obtain title to mineral lands, it is obvious that no broad and unqualified rule can arbitrarily be enforced which will be effective under the present laws. Land which is in fact non-mineral is subject to agricultural entry, and if a party seeks under such entry to obtain title to a mineral tract, it is the duty of miners and others who may know its true character to appear at the district Land Office *and submit proof thereof*. The knowledge of the character of any certain tract is local, and this Office must necessarily depend upon parties in the vicinity to prevent fraud in said respect. Published notice of 30 days is uniformly required of parties who seek agricultural entry on lands withdrawn as mineral, and thereby all parties are advised and furnished opportunity to defeat any fraudulent entry.

"In regard to the alleged proceedings of said railroad company, you are advised that when a hearing is had to determine the character of certain lands, those alleging them to be valuable for mineral should *submit their proof at the hearing*, and thereafter this Office would be in a position to conclude the respective claims of all parties. But if you neglect to submit your proof, and the said company presents none, it is plain that this Office can render no final decision, nor can I anticipate any particular excuse which may be urged for the neglect.

"In short, if under the present laws those interested in preventing fraudulent entries of mineral lands will avail themselves of the means now furnished them by existing regulations, and appear and *insist* upon the right to submit their testimony at the hearings referred to above, and notify this Office forthwith of any refusal to receive their testimony, or irregularity of proceedings, a just conclusion can be usually reached; but without the co-operation of those interested in an honest disposition of the public lands, it is apparent that this Office labors under great embarrassments.

"You are assured that it is the desire of this Office and Department to be advised *by affidavit* of attempted fraud in any case; but it is clearly impracticable to act upon general allegations referring to no particular claim and tract."

THE dividends of mining companies, having their headquarters in San Francisco, for the year 1879 aggregated $6,678,000, over $11,000,000 less than last year.

An Improved Cam for Quartz Mills.

We illustrate herewith an improved cam for quartz mills, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by Lewis A. Moore and John Dykes, of Oresna, Humboldt county, Nev. The improvements in the cam consist in forming a removable shoe or face attached to the body of the cam by means of bolts, and placing between said body and shoe a cushion or packing of any elastic substance that will yield or spring under the blow of the cam on the tappet, so as to reduce the jar attendant on the sudden contact.

In Fig. 1 the body of the cam, *A*, is shown in double form as usually applied to quartz mills. A hole is formed through the center through which the cam shaft passes, the cam being keyed to said shaft in the usual manner. The body of the cam and also the shoe, *B*, may be constructed of steel, iron, or any other metal adequate to the requirements. Between the shoe and body of the cam is adjusted a strip or cushion, a, of any required thickness, composed of vulcanite rubber, or any other suitable elastic substance that will yield or spring under the blow of the cam on the tappet. The joint surfaces between the body of the cam and of the shoe are made to correspond one with the other as shown, so that a perfect joint is effected between the body of the cam and the shoe when the cushion or packing is put in place. The whole is then bolted or secured firmly together with bolts or studs, *D*, running transversely through the body of the cam from the lower edge to and into or through the shoe, *B*, fitting rather loosely without threads through the cam body, *A*, but tapped and screwed into the shoe, bringing the shoe, *B*, firmly down on the cushion and cam body. The joint surfaces between the body and shoe may be plain or corrugated, or the shoe may have a bulb at one end as shown at *C*, or he made in any desired shape, so that the joint surfaces correspond one with the other, admitting the cushion between, and not altering the proper angle of the face of the cam. Fig. 2 shows the cam with shoe removed.

In this improved cushioned and shoed cam, when the shoes become worn they may he adjusted in a few moments without displacement of the body of the cam, thereby saving great time, labor and expense, as usually the cams have to he unkeyed and entirely removed from the cam shaft. In case the cam or shoe wears away in a bevelled shape the shoes can be changed from one arm of the cam to the other arm of the same cam, or to any of the other cams of the battery, and *vice versa*, thereby effecting equal wear on both the shoes and tappets.

The yielding capacity of the cushion effectually and completely obviates all violent or sudden blows, which are so destructive to the iron work of the battery, since under a cushioned blow crystallization of the iron does not occur, nor does looseness of cams and tappets, or chipping and breaking take place. Neither will the shoes or bosses be apt to drop from the stem, as is the case when a succession of sudden jarring blows is made with a solid cam. As the cam and tappet come together easily and smoothly, there will be no loss of power incident to drawing the stems against the guides of the battery.

Nobility of Labor.

It has long been a disgrace to the intelligence of the age, that a stigma should be attached to labor. It is the source of national and individual wealth. It is the primary cause of social comfort and convenience. It has raised man from the lower grade of an animal prowling for his food to the higher plane of an intellectual being, possessed of reason, thoughtfulness, foresight and inventive faculties. It has given man a clear insight into the laws of nature, and has brought him into close companionship with the Creator. It has made him a creator, not of matter, but of new forms of its adjustment. He has made the iron and the wood his docile slaves, and caused them to perform work which, without their aid, he could never have accomplished. By labor he has sunk his mines deep into the earth and extracted therefrom earth's most valuable treasures. By labor he has made the fields to yield abundant harvests, and gathered from them the world's supply of food. By labor he has built his ships, whose sails bear them to all portions of the world and sustain the mighty operations of commerce. By labor he has constructed railroads which traverse continents, and transport in their trains, not only multitudes of human beings but also the products of the mines, the fields, the factories and the workshops. By labor he has run his tunnels through mountains and under rivers, and rendered quickly accessible sections of country which else could only he reached by long and tedious journeys. By labor he has stretched around the world the wires of the telegraph, and has given thereby to himself the God-like attribute of omnipresence. By labor he has produced the telescope which has shown to him the vastness of the Creator's designs and works, in the millions of worlds that are placed throughout the realms of space. By labor he has analyzed the compound forms of matter, and has found the constituent elements of their composition. By labor he has closely emulated Deity, for God worked in the creation of all worlds, and in the production of all the living forms that are found upon them.

With such a record labor should stand in the highest niche of honor and of fame, and the man who is the most prominent in works of utility should reach the highest standard of nobility, and should he the most honored among his fellow-men. It is a false and ignoble pride that has engendered this prejudice against labor. It is the direct action of evil against positive good.

For all these benefits which it has conferred upon mankind, it should receive the gratitude of all. The pride that from its mole-hill eminence endeavors to look down with contempt upon labor, could never have attained its ephemeral existence or its insignificant elevation, had it not been for the labor performed by others. The most utile nobility among men is the self-sustaining nobility of labor.

Dividend-Paying Mines.

A Leadville (Col.) paper crows over a statement that in October, Leadville mines paid dividends amounting to $135,000, while dividends for California, Nevada and Black Hill mines aggregated during the same period $447,200; so the Leadville mines paid about one-third as much as all the dividend-payers of the West.

Now, if this was a fact, the Leadville journal might have cause for self-gratulation; but it is not a fact. The mistake is made of estimating the dividend-paying mines of the West, particularly of this State, by counting those only quoted on the stock boards. No greater mistake could be made. There are very few, proportionately, of the mines which are listed at all. In this State, particularly, not more than a dozen or so appear on the boards.

We don't recollect seeing a quotation of stock for a California hydraulic mine for several years; yet this class of mines produce over a million a month regularly. Many of them pay their owners handsomely. None of the stock is for sale, and the dividends are quietly pocketed without any newspaper heralding whatever.

Hundreds of quartz mines worked by private owners and private companies pay dividends regularly that the public knows nothing of. Yet in the new districts, like Leadville and the Black Hills, when a mine pays a dividend and there is a great fuss made over it, the fact being telegraphed all over the country.

The drift mines alone in this State produced over two millions of dollars last year; but there is not one Eastern man in a hundred knows even what a drift mine is or how it is worked, yet they have paid handsome dividends. Still not one of them is quoted on our board. The reason is apparent enough. The mines that pay regularly and are properly opened and developed do not need the stock board to assist them. Plenty of men are willing to own stock in such claims and keep it as a legitimate investment. That is not the sort which is "worked" by the hulls and bears.

Such mines, however, are not for sale to Eastern people or any others. The owners do not care about their doings being published abroad. We know of one little mine alone in this State, owned by three men, which is paying above expenses over $50,000 per month; yet if we should mention its name, very few would ever have heard it. There are many others on a smaller scale. We don't like to see *all* our mines take a "rating" from the few listed on the stock boards.

The Control of Comstock Mines.

[Written for the PRESS by J. D.]

Although the stocks of the Comstock mines are very much depressed, and people feeling poor on account thereof, yet the business of prospecting and development still goes on; and with the doubt of the future results of the prospecting hanging over the business, the assessments constantly levied, first on the stock of one mine then on another, continue to he paid. The Comstock stockholders have the nerve to submit as long as they have the means to respond to oft-repeated assessments, and they exhibit a degree of patient submission which is truely admirable. It may ho that as they have been so long accustomed to it, they have formed a habit which has become second nature. Often when the report has been circulated that a bonanza has been found in a mine, and that the extraction of ore would immediately commence, making the fortunate stockholder buoyant with the hope that he would soon be the recipient of large dividends, his hopes would be blasted by the announcement that there was an assessment levied on the stock, which of course would be the last one that would he levied, and he pays it, expecting to he receiving monthly dividends ever after. But, alas, another assessment is levied, and in due course of time another, and so on—the end thereof he knoweth not—notwithstanding the fact is reported that a bonanza exists in the mine. If the money collected by assessments was always honestly and judiciously expended in the development of mines where there was evidences that a mine existed, then there would he more satisfaction in paying them.

If a stockholder had the privilege at any time he choose of going into and examining the property which he is an owner in, so that he could judge for himself as to the prospect of developments of ore being made, and to see with his own eyes whether work was being intelligently and honestly done; and to see whether or not the parties having the management were managing for their own interest without regard to the interests of other stockholders or proprietors, then he would submit with better grace to repeated assessments if he found all things conducted in an intelligent and proper manner.

Why are parties so anxious to become managers of mining property, unless it is because they fear that other persons if they obtained control would not conduct matters for the best interests of all the stockholders; or is it that they want the opportunity to manage for *their own* individual interests and make money out of it, even if the other stockholders suffer by it? The general supposition is, that the managers conduct the business so that they will have an advantage over all other stockholders and make money, while others loose. They keep secret the exact condition of the mine, and report it in a better condition than it is; or do not let it he known until it suits them, when a body of ore is developed. They are on the inside, and profit by it. If ore is discovered and it is generally known, the stock would in consequence go up. That they do not want, until they have succeeded in depressing it as low as possible, and keep it there until they have bought up all they can, then, of course, the cat is let out of the bag, and they proceed to circulate reports, and inuendoes to hull the stock to a high figure, when they sell and make a very good thing out of the "deal."

They do not expect to enrich themselves from dividends, but on the rise of the stock in the market. This explains why persons are so anxious to become managers of mines. The Union Con. has run about 80 feet through ore of tolerably high grade. Now whether that is through the width of the ore body, or lengthwise, or diagonally, is not generally known on the outside. The exact condition in regard to the deposits of ore found in the Sierra Nevada is not known except to insiders. There may be more ore developed in the mine than the managers care to have known by the owners of the mine outside of themselves, or there may be less, which fact they keep concealed to delude the public, to keep the stock up. As to the Mexican, favorable indications, such as "bird's-eye porphyry," clay and streaks of "kindly"-looking quartz, to keep the stock up is about played out.

The sham arrangements entered into by the Bonanza firm and Hayward and his friends for control of the Hale & Norcross; also that with Graves and his friends for control of the Yellow Jacket, are pretty well understood. The same superintendents who officiated under the old management are retained by the new, and one of them is also made a trustee. This may have been done to convince people that Flood & Co. do not know of any bonanzas in either of those mines. But people will not he convinced. They are so full of disbelief that they think the Bonanza firm still have the secret management.

However that may be, it seemed strange to the public that Mr. Hayward and friends, and Graves and friends, should wish to get control of those mines. As the Bonanza firm own mills that are now idle, they have, I have no doubt, made arrangements with Hayward, Graves & Co., to let the ore from the Hale & Norcross and Yellow Jacket go to their mills as soon as they commence the extraction. It is quite an object for a company owning mills to he able to control the ore coming out of the mines. The reduction of ore they make quite profitable. All that comes out of the rock does not go to the mining companies, only a percentage of it. Neither do the slime and tailings. All these perquisites, with the price charged per ton for reducing, make the milling of ores quite profitable. It will he seen that it is quite an object to get control of one of our mines, for the reason that those having it control the manipulation of the stock, the reducing of the ore and furnishing supplies, and the outsiders have to pay the assessments, and submit to all of the requirements made on them without having a voice in the business, and not even allowed to know the condition of their property, or that in which they hold a large interest, but their authority over it is entirely ignored. I suppose that there is some profit attached to the control of the bullion, as well as other items mentioned above.

So, taking matters altogether, there is no wonder that there is strife to get control of mines. Those who have it make a good thing out of it when the shareholders make nothing, when there are no dividends.

Of course it is necessary that mining stocks should he assessed, to furnish the means for opening and developing mines, but then the money raised in that manner should he applied to carry out the objects for which it is raised. The managers should he intelligent business men as well as honest, and should employ superintendents and subordinates who are versed and skilled in the business which they undertake to perform. This is expected of mine managers; and if they do as they should, the business of mining would he looked upon in a different light from what it is now. It is a legitimate and important industry, unassociated with schemes of swindling and gambling. Work mines for what they are worth, not for the purpose of speculating on the stocks.

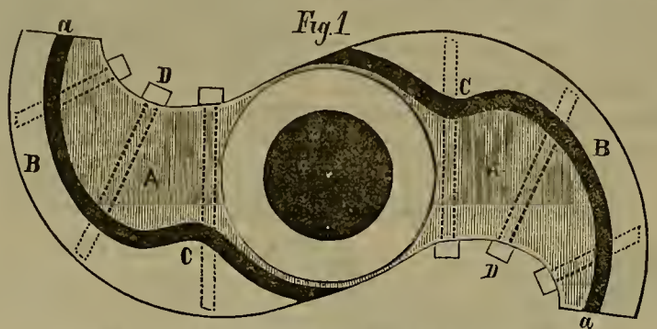

Fig. 1

MOORE & DYKES' IMPROVED CAM FOR QUARTZ MILLS.

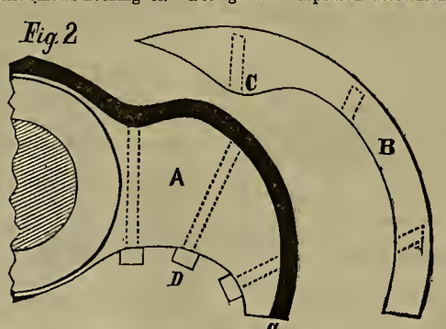

Fig. 2

CAM WITH SHOE REMOVED.

THE NOONDAY MILL.—The new 30-stamp mill of the Noonday mining company, at Bodie, was started up for the first time on Christmas day. This mill was built in San Francisco by Hinkley, Spiers & Hayes of the Fulton foundry. The Bodie *Standard* describes the Christmas start as follows: A lady visitor sounded the whistle for the start, and when the ponderous machinery moved of like the works of the most delicate watch, other lady visitors seized the whistle cord and made the welkin ring with a prolonged whistle. The visitors included members of the press, merchants, bankers and others, and all seemed as delighted with the fine success of the start as if they had been personally interested as builders. Mrs. John Parham, wife of the Superintendent of the Noonday mine and mill, presided in the engine room and did the honors by personally opening several baskets of champagne. Toasts were drank, but the noise of the heavy machinery was too great for any extended remarks in reply. The mill is situated near the mine, with a railroad track running from the hoisting works to the batteries for the transportation of ore. The hoisting works are of the most improved and powerful kind, and the mill is a model, and the smoothness with which it runs, and the efficiency with which it does its works reflects the highest credit upon all connected with its construction and operation.

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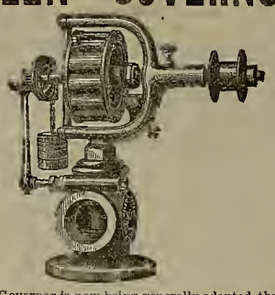

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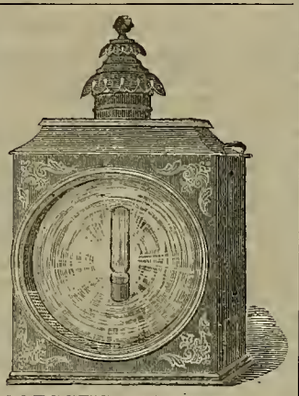

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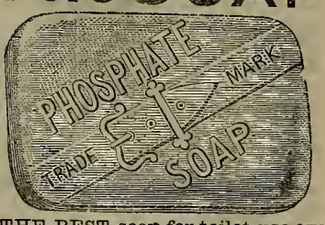

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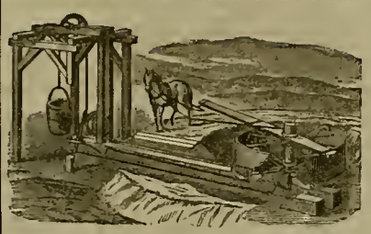

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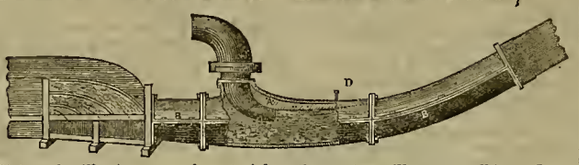

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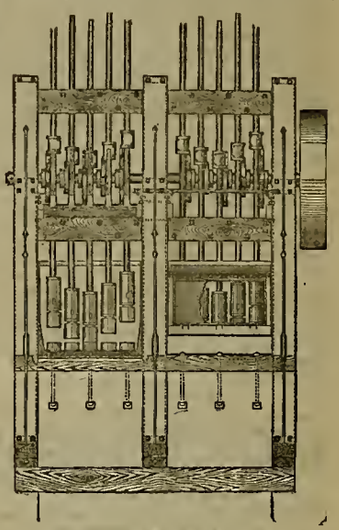

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CONTINUED FROM PAGE 5.

known as Mineral Hill, 12 miles east of Florence, which are surprisingly rich. In the Finch mine, at the depth of 64 ft, a body of ore five ft wide was struck, which assays from $500 to $3,000 per ton in silver. Also in the Jonce & Nesbith mine, this same body of ors is found, but not quite so wide, though it also has a fine prospect. The diggings are on an iron-capped mountain which stands out by itself and is a general network of veins and ledges running in all directions, and which have always been thought nothing but iron. Finch was offered $50,000 in cash for his claim; and others had also good offers, but not so much as Finch, as his is far the best claim.

ITEMS.—The McCrackin mill is running on tailings. The Signal mill will start up Jan. 1st. The tunnel in the Eureka mine, Black hills, is in 270 ft. Masterson's mill, on Turkey creek, is running on Goodwin ore. The Peck mill starts up soon. Good ore is being taken from the 175 level of the Silver Prince mine. The Corbin mill, 15 stamps, in the Tombstone district, will be ready to start up Jan. 1st. Bob Groom has recently discovered a fine ledge on Castle creek which gives, by assay, $320 gold per ton and 40% copper. Mr. Worthington has located some valuable copper claims, and is perfecting arrangements for the erection of a custom mill, on Tule creek, near the Pearl mine, in a northeasterly direction from the Tiptop. Castle Dome has lately shipped 50 tons of ore. The Western mining company lately received 100 barrels of bluestone.

RICH STRIKE.—Tombstone *Weekly Nugget*, Dec. 25: A new and rich strike has been made on the south side of the Mule mountains, assaying between $7,000 and $8,000 per ton. This strike is in the joint shaft between the Champion and Green Horn claims, and is found at a depth of about eight ft. Foley & Co. own these claims, and their location is in the pass about two miles from Dyer's camp. In the same locality the Silver Rule has a shaft 18 ft deep, from which they are taking out ore assaying $125 in gold and $150 in silver. Globe claim gives about the same assay. It is thought these ledges are 20 to 40 ft wide, the walls not having been reached on either side. Mr. Fraser has a claim there which gives $4,880 to the ton in silver. Morgan & Hagin get from $400 to $1,200 from their ore. Dyer Bros. also have some fine claims. Placer miners are making $2 to $3 per day. Great many prospectors are now in the camp.

COLORADO.

MOUNTAIN CHIEF.—Silver Cliff *Prospector*, Dec. 22: This mine is located in Crees' camp, about eight miles from Marysville. Ore is packed down the mountain side, a distance of three miles, on burros, and from there wagoned to Silver Cliff, where it is sampled and then hauled to Canon, thence by rail to Omaha, Nebraska, where it is smelted. This mine, at a distance of only 30 ft, has more than paid expenses.

SALE OF A MINE.—The Denver City mine, near Leadville, has been sold to Philadelphia parties for $125,000. The new owners propose to stock the mine and place it on the Eastern markets at once. The shaft is down 430 ft.

SURPRISING ASSAY.—Fairplay *Flume*, Dec. 25: A very surprising result was obtained a few days since from rock taken out low down on Sacramento gulch. The drill had penetrated, in sinking, several feet of black sand. This was at a depth of not over 60 ft, and the sand was thought to be a part of the deep "slide" that covers the rock in place in this gulch. Out of curiosity the owners had the sand tested by the assayer at the Duquesne smelter. It returned a button that weighed up at the rate of over 360 ounces, or over $7,000 to the ton in gold. All the parties interested are incredulous over the result, and are drying more of the sand, preparatory to having several more tests made.

RUMORED LEASE.—It is rumored that Judge Bond has leased the Phillips mine to a company from Leadville. They have ample means and are compelled by the terms of the contract to have a first-class 20-stamp quartz mill in running order on the premises by the first of March next.

COAL MINING.—Six men, under the direction of E. J. Bowen, are opening the newly discovered vein on Lillenthal's ground with excellent success. The vein is widening as they go down, and although the coal is still soft, yet it is no more disintegrated than might be expected so near the surface. The four years' lease of this ground, which the company has secured on favorable terms, is worth considerable money. They have also leased from C. F. Ulmer his coal land near by, on which coal has been "proved up" in quantity long since. Members of the company have also located and claimed out-lying tracts of land near by. Work will be prosecuted on all of these, and systematically carried on until a sufficient amount of coal to operate extensive coke pits has been secured.

CLEAR CREEK ITEMS.—A good strike was made recently on the Baxter at a depth of 100 ft from the surface, consisting of a six-inch vein of ore, consisting largely of gray copper, and carrying native silver sprinkled through it. A run of ore from the Emma lode, on Democrat mountain, recently milled at the rate of 602¼ ounces of silver per ton without classifying.

IDAHO.

ATLANTA.—*Idaho World*, Dec. 23: The Yuba tunnel at Atlanta is progressing finely, and richer ore is being developed as depth is obtained on the mine. A sufficient ore body has already been developed to warrant the erection of an 80 or 100 stamp mill at the mouth of the tunnel. There is abundance of wood and water handy, and low grade ores can be worked with profit.

COAL DISCOVERY.—Boise City *Statesman*, Dec. 23: Mr. T. A. Mulford has discovered coal within three miles of Boise City. He has had large experience in the coal mines of Pennsylvania, and expresses himself satisfied that the vein he has discovered extends across and underlies most of the Boise and Lower Payette valleys, as the main formation crops out along the banks of these rivers. Overlying the vein there is a thick strata of slate, specimens of which he showed us. Mr. Mulford is making preparations for thoroughly prospecting his discovery.

MONTANA.

A GLACIER CLAIM.—Helena *Independent*, Dec. 18: The Montana mine, in the Yankee Fork country, was found in a real glacier. Sixty ft of the surface croppings had been broken off and carried some 30 or 40 ft down the mountain. The owners knowing the glaciers never move up hill, followed upward through the ice and frozen ground until they reached the point where the lode was broken off, finding it as large and quite as rich as below. The company's ore-house, dump, etc., are all on this glacier, but its movements are not perceptible, if indeed it is moving at all.

OREGON.

MINING ITEMS.—Jacksonville *Sentinel*, Dec. 24: Ed. Hutt, one of the miners on Foot's creek, in making a partial clean-up last Monday, took out a nugget weighing $22. Along Foot's creek is some of the best mining ground in southern Oregon. There are five hydraulic mining companies at work on the left-hand fork of Foot's creek, and one on the right-hand fork of that stream. Three are worked with six-inch pipe, one with ten-inch, and one with eleven-inch pips. Work before last a slide occurred at the Squaw Lake company's ditch, which it took only a few days to shovel out. The ditch was never in better condition than now. Piping commenced Tuesday morning of last week on ground which had previously been thoroughly prospected. Notwithstanding there is 20 inches of snow on the ground, the company was piping at last account. The very light estimate usually placed on the gold yield of Jackson and Josephine counties by writers on Oregon, has induced us to make inquiry into this subject. There is no way to ascertain with certainty what the actual yield has been during the past 25 years, but from the most reliable sources of information we are satisfied that it has been quadruple the amount usually estimated. One individual alone, C. C. Beekman, of this place, informs us that he has, for himself and the express company, handled over $10,000,000 worth of gold dust since 1853, the largest portion of which was taken from Rich gulch, Jackson, Jackass and Sterling creeks. From his intimate knowledge of the business of other buyers, and from information derived from equally reliable sources in Josephine county, Mr. Beekman gives a decided opinion that at least as much more has passed through other hands from that date until the present. This would give an average yield of $500,000 per annum for the two counties, and when the really small amount of ground worked over is considered an approximation of the probable future yield of gold in southern Oregon would seem fabulous and incredible. Hydraulic mining is proving successful wherever sufficient water can be obtained, and it seems as if mining in this end of the State was just commencing.

UTAH.

ITEMS.—Silver Reef *Miner*, Dec. 20: The Kinner continues to furnish the Leeds mill with about 15 tons of ore a day. The recently-ordered hoisting machinery will probably not reach here for three weeks yet. The Thompson & McNally is shipping about 20 tons of ore to the mill daily. On this property the Bemis shaft is now down 24 ft, from the bottom of which drifts north and south are being run. The drift north is now in over 30 ft on a 2½-ft vein of good ore. An inclins west, following the dip of the vein, is also down about 20 ft. In the south stops, at the main works, some very rich ore has been found.

WASHINGTON.

IRON ORE.—Glympia *Transcript*, Dec. 20: Deposits of iron ore have been known to exist in this vicinity for years past. In the marshes east of the city bog, ore has been found, as also in the Black hills, a few miles west. About Black lake, when Government surveys were made, many years ago, the attraction was so great the compass was useless. We have no doubt but that it could be found in quantities sufficient to justify working, and would be a better bonanza to find than a silver mine.

SKAGIT GOLD.—Mr. E. G. English, of Mt. Vernon, was up from the Skagit on Wednesday, and had with him some of the Ruby Creek gold. It was fine, flake gold, good color, and is worth $17 per ounce. He informed us that the dust taken out at this mouth of Ruby creek, and on the Discovery claim on Canyon creek, is coaser, which leads miners to believe that there are several leads, and that probably quartz ledges will be found hereafter.

News in Brief.

INDIGNATION meetings continue to be held in Maine.

SALARIES of lower grade teachers in Stockton have been reduced 10%.

A MOVEMENT is on foot in New York to suppress female pedestrianism.

THE emigration fever has broken out again among the Southern negroes.

THE reported success of the electric light has caused another tumble in gas stocks.

WM. MCKEE, SR., proprietor of the *Globe-Democrat*, died at St Louis recently.

NEILL, the Illinois cattle king, whose liabilities aggregate $400,000, is still missing.

THE office of the Walla Walla (W. T.) *Statesman* was partially destroyed by fire recently.

THE Grangers' Bank of California has reduced its capital stock from $2,500,000 to $1,000,000.

MRS. CYNTHIA HODGDON, for malpractice, has been sentenced to State prison for ten years.

SPENCER, the missing Chicago Savings Bank President, is at present at Wurtemberg, Germany.

UPPER Pacific ports have been blockaded by ice during the cold snap, and steamers were frozen in.

DAN RICE, the circus clown, has become converted, and will at once enter the field as an evangelist.

OREGON is moving in the matter of inducing colored people to imigrate from the South to that State.

JAMES H. TURNER, editor of the *East Oregonian*, stabbed and killed a man at Pendleton, Or., on the 22d ult.

A SIX DAYS' pedestrian match is in progress at the Mechanics' pavilion in this city. There are 24 contestants.

THE export of cotton at New Orleans Saturday aggregated 46,300 bales—the largest on record in one day.

SAM WOODWARD and Seminole Joe, two murderers, were lynched, Sunday, at Golden, Colorado, by vigilants.

MAYOR KALLOCH, of San Francisco, has vetoed the ordinance granting a franchise to the Presidio Railroad Co.

CORRESPONDENCE has been discovered proving an alliance between the German Socialists and Russian Nihilists.

THE British troops in Afghanistan have recently experienced a change of fortune, and are victorious over the Afghans.

HON. R. E. LITTLE, a prominent Kentucky politician, was shot and killed at Louisville recently by his brother-in-law.

THE third annual session of the State Teachers' Association, convened in this city on the 29th ult., and continued three days.

HART, the colored man, was the winner in the late six days' pedestrian contest in New York, having made 540 miles.

IT is said that on the 1st of January J. C. Flood contemplates retiring from all active operations in the stock market.

THE severest weather reported for years has prevailed in Minnesota, the thermometer, Christmas, marking 40° below zero.

IT is rumored that Grant will succeed Scott as President of the Pennsylvania railroad, the latter's physical condition being hopeless.

LAWRENCE L. HOMER, the discoverer of the Homer Mining district, near Bodie, Mono county, recently suicided in San Francisco.

AT Oxford, Cumberland county, Nova Scotia, at daylight Sunday, the mercury fell to 35° below zero, lower than ever known before in that region.

MUCH anxiety is manifested among the Mormons over the rumor that Congress is about to take immediate steps toward the extinction of polygamy.

THE schooner *Mary D. Pomeroy*, from Crescent City for San Francisco, capsized off Point Reyes, and all on board, including 12 passengers, were probably lost.

The State Government, 1880.

Executive Department.

Governor.....George C. Perkins.
Lieutenant-Governor.....John Mansfield.
Secretary of State.....D. M. Burns.
Controller.....D. M. Kenfield.
State Treasurer.....John Weil.
Attorney-General.....A. L. Hart.
Surveyor-General.....J. W. Shanklin.
Superintendent of Public Instruction.....F. M. Campbell.
Clerk of Supreme Court.....Frank W. Gross.
Chief Justice.....R. F. Morrison.
Associate Justices.—E. W. McKinstry, J. D. Thornton, S. B. McKee, E. M. Ross, J. R. Sharpstein, M. H. Myrick.
State Board of Equalization.—First District—James L. King; Second District—M. M. Drew; Third District—Warren Dutton; Fourth District—T. D. Heiskell.
Railroad Commission.—First District—Joseph S. Cone; Second District—C. J. Beerstecher; Third District—Geo. Stoneman.

Senate.

First District—San Diego and San Bernardino - J. W. Satterwhite (D.), San Bernardino.
Second District—Los Angeles—J. P. West (W. and N. C.), Compton, Los Angeles county.
Third District—Ventura, Santa Barbara and San Luis Obispo—Warren Chase (W.), Santa Barbara, Santa Barbara county.
Fourth District—Fresno, Tulars, Kern, Mono and Inyo—Chester Rowell (R.), Fresno, Fresno county.
Fifth District—Mariposa, Merced and Stanislaus—D. M. Pool (D.), Hornitos, Mariposa county.
Sixth District—Monterey, San Benito and Santa Cruz—W. J. Hill (W., N. C. and R.), Salinas City, Monterey county.
Seventh District—Santa Clara—George F. Baker (R.), San Jose, Santa Clara county; J. C. Zuck (R.), Gilroy, Santa Clara county.
Eighth District—San Francisco and San Mateo—Robert Desty (W.), San Francisco.
Ninth District—San Francisco—C. C. Conger (W.), 1,420 Broadway street; W. W. Traylor (R.), 2,120 Broadway street.
Tenth District—San Francisco—Paul Neumann (R.), 1,718 Bush street; John H. Dickinson (R.), 2,021 California street.
Eleventh District—San Francisco—Thomas Kane (W.), S. Zoe street, bstween Third and Fourth streets; T. K. Nelson (W.), 546½ Bryant street.
Twelfth District—San Francisco—Joseph C. Gorman (W.), 534½ Natoma street; Martin Kelly (W.), 872 Mission street.
Thirteenth District—San Francisco—John S. Enos (W.), Chenery street, between Thirtieth and Thirty-First streets; Theo. H. Hittell (R.), 808 Turk strset.
Fourteenth District—Alameda—S. G. Nys (R.), Oakland, Alameda county; E. H. Pardee (R.), Oakland, Alameda county.
Fifteenth District—Contra Costa and Marin—W. H. Sears (R.), San Rafael, Marin county.
Sixteenth District—San Joaquin and Amador—B. F. Langford (N. C. and D.), Lockford, San Joaquin county; A. T. Hudson (R.), Stockton, San Joaquin county.
Seventeenth District—Calaveras and Tuolumne—R. M. Lampson (R.), Chinese Camp, Tuolumns county.
Eighteenth District—Sacramento—Grove L. Johnson (R.), Fifth street, between I and J streets, Sacramento; William Johnston (R.), Richland, Sacramento county.
Ninsteenth District—Solano and Yolo—J. H. Harlan (N. C. and D.), Woodland, Yolo county; J. T. Wendell (R.), Suisun, Solano county.
Twentieth District—Napa, Lake and Sonoma—W. L. Anderson (D.), Lakeport, Lake county.
Twenty-First District—Sonoma—W. W. Morsland (D.), Healdsburg, Sonoma county.
Twenty-Second District—Placer—S. B Burt (R.), Bath, Placer county.
Twenty-Third District—El Dorado and Alpine—W. H. Brown (R.), Shingle Springs, El Dorado county.
Twenty-Fourth District—Nevada and Sierra—B. J. Watson (R.), Nevada City, Nevada county; William Georgs (R.), Grass Valley, Nevada county.
Twenty-Fifth District—Yuba and Sutter—E. A. Davis (R.), Marysville, Yuba county.
Twenty-Sixth District—Butte, Plumas and Lassen—W. A. Cheney (R.), Quincy, Plumas county.
Twenty-Seventh District—Del Norte, Humboldt and Mendocino—P. H. Ryan (W., N. C. and D.), Eureka, Humboldt county.
Twenty-Eighth District—Siskiyou, Modoc, Trinity and Shasta—A. B. Carlock (R.), Fort Jones, Siskiyou county.
Twenty-Ninth District—Colusa and Tehama—B. B. Glascock (D.), Duunigan, Yolo county.

Assembly.

Alamsda County—C. N. Fox (R.), Gakland; W. W. Cameron (R.), Oakland; G. W. Tyler (R.), Alameda.
Amador County—R. C. Downs (R.), Sutter Creek; L. Brusie (R. and N. C.), Ione City.
Butte County—Max Brooks (R.), Groville; W. W. Durham (R.), Durham.
Contra Costa County—D. N. Sherburn (R.), Danville.
Calaveras County—H. A. Messenger (D.), Mokelumne Hill.
Colusa and Tsbama Counties—W. P. Mathews (D. and N. C.), Tebama, Tehama county.
Del Norte County—L. F. Cooper (D.), Crescent City.
El Dorado County—T. Fraser (R.), Placervills.
El Dorado and Alpine Counties—Cyrus Coleman (R.), Marklesville, Alpine county.
Frssno County—C. G. Sayls (D.), Fresno.
Humboldt County—C. L. Stoddard (W.), Ferndale.
Inyo and Mono Counties—Joseph Wasson (R.), Bodie, Mono county.
Los Angeles County—P. M. Green (W. and R.), Pasadena; R. F. Del Valle (D.), Los Angeles.
Lake County—A. P. McCarty (D.), Lakeport.
Mariposa and Merced Counties—W. F. Coffman (D.), Mariposa.
Marin County—C. L. Estee (R.), Nicasio.
Msndocino County—L. G. Morse (N. C. and R.), Point Arena.
Monterey County—E. S. Josselyn (R.), Monterey.
Napa County—W. J. Maclayt (R.), Napa City.
Nevada County—J. Levee (W.), Lowell Hill; A. M. Walker (W.), Truckee; J. G. Sweetland (W.), Sweetland.
Placer County—T. L. Chamberlain (R.), Lincoln.
Plumas and Lassen Counties—Charles Mulholland (R.), Janesville, Lassen county.
San Fraucisco County—Ninth District—W. J. Sinon (W.), 2,015 Hyde street; W. W. Cuthbert (W.), 1,505 Montgomery street; S. J. Garibaldi (W.), 1,516 Powell street; James R. Finlayson (R.), 1,512 Jones street.
Tenth District—T. H. Merry (R.), 2,610 Sacramento street; W. B. May (R.), 1,114 Clay street; G. B. Ward (R.), 27 Dunn street; H. A. Gorley (R.), corner Sacramento and Devisadero streets.
Eleventh District—J. J. McCarthy (W.), 270 Minna street; G. Picket (W.), 17 Clementina street; J. J. McCallion (W.), 60 Natoma street; S. Braunhart (W.), 220 Third street.
Twelfth District—J. J. McDade (W.), 1,148 Folsom street; Michael Lane (W.), 19 Powell street; John Burns (W.), 10 Broadway place; P. T. Goffey (W.), 521 Natoma street.
Thirteenth District—L. J. Hardy, Jr. (R.), 6 Beaver street; J. F. Cowdery (R.), 2,406 Mission street; Stephen Maybell (W.), Thirtieth street, between Church and Dolores streets; A. B. Maguire (W.), 442 Twentieth street.
Sacramento County—Seymour Carr (R.), Michigan Bar; J. N. Young (R.), corner Fifth and J streets; Elwood Bruner (R.), J street, betweeu Sixth and Ssventh streets.
San Diego County—C. C. Watson (W. and N. C.), Paguay.
San Bernardino County—H. M. Streeter (R.), Riversids.
San Luis Obispo County—H. Y. Stanley (D.), Morro.
Santa Barbara and Ventura Counties—Milton Wason (W. and R.), Santa Paula, Vsntura county.
Santa Clara County—R. McComas (R.), Santa Clara; J. L. York (R.), San Jose; D. Frink (R.), Mountain View.
Santa Cruz County—Elihu Anthony (W. and N. C.), Santa Cruz.
San Benito County—J. J. Harris (D.), Hollister.
San Joaquin County—W. R. Leadbetter (W. and R.), Stockton; H. J. Corcoran (N. C.), Stockton; E. J. McIntosh (W. and N. C.), Woodbridge.
San Mateo County—C. N. Felton (R.), Menlo Park.
Sierra County—James Nelson (R.), Forest City.
Siskiyou and Modoc Counties—J. R. Cook (D.), Lake City, Modoc county.
Stanislaus County—J. D. Spencer (D.), Modesto.
Solano County—F. A. Leach (R.), Vallejo; A. Bennett (R.), Maine Prairie.
Sonoma County—James Hynes (D.), Petalumn; H. R. Brown (D.), Healdsburg; James Adams (R.), Santa Ross.
Sutter County—A. L. Chandler (R.), Nicolaus.
Trinity and Shasta Counties—J. S. P. Bass (D.), Buckeys, Shasta county.
Tulars and Kern Counties—A. B. DuBrutz (D.), Plano, Tulare county.
Tuolumne County—D. Dimond (R.), Columbia.
Yolo County—D. N. Hershy (D.), Black's Station.
Yuba County—J. P. Brown (R.), Camptonville; T. H. Carr (D. and N. C.), Smartsville.

Recapitulation.

SENATE.

Republicans	22
Democrats	5
Workingmen	8
Workingmen and New Constitution	1
Workingmen, New Constitution and Republican	1
New Constitution and Democrats	2
Workingmen, New Constitution and Democrat	1
Total	40

ASSEMBLY.

Republicans	37
Democrats	14
New Constitution and Republicans	2
Workingmen	17
Workingmen and New Constitution	3
New Constitution and Democrats	2
Workingmen and Republicans	3
Union ticket	1
New Constitution	1
Total	80

BOTH HOUSES.

Republicans	59
Democrats	19
New Constitution	1
Workingmen	25
Workingmsn and New Constitution	4
New Constitution and Democrats	4
Workingmen, New Constitution and Republican	1
Workingmen and Republicans	3
Workingmen, New Constitution and Democrat	1
Union ticket	1
New Constitution and Republicans	2
Total	120

†Deceased.

Decision on Riparian Rights.

The *Call* gives an outline of a decision which may he of local importance to all parts of the State. It seems that suit was commenced a long time ago by Leland Stanford, in the Nineteenth District Court, to enjoin J. J. Felt and William Stanton from diverting the waters of Franco's creek, San Mateo county, and for $4,000 damages. Subsequently the action was transferred to the Twelfth District Court, and tried. All of the parties in the suit own land on the hauk of the stream. The defendants are higher up the stream than Stanford, and it was shown hy the testimony that they had constructed a dam and conducted the water about three-quarters of a mile into a ten-acre reservoir. In this reservoir are natural springs, and it is also supplied from the hills. At no time is the stream very deep, and in summer there is scarcely enough water for domestic use and the support of animal life. Stanford keeps a number of horses on his farm, and he complained that the diverting of the waters of the stream rohhed his stock. The defendant said that he turned the waters from the creek to purify his reservoir hy running a stream through it, hut the evidence in the case proved that there was no outlet for it.

In passing upon the case, Judge Daingerfield said: The stream is too small to furnish water for irrigation, except for a small patch or garden spot, and without securing the same in small reservoirs, would not be sufficient for any such use. The general rule for such cases is, that the upper proprietor of land has the right to its use, and to divert it from the hed of the stream, if he return it without *material* diminution; hut this right of diversion would not apply in the case of a small stream that would he absolutely absorbed hy the diversion, or even greatly diminished. If the stream could be diverted and hy means of pipes or ditches conveyed to a reservoir, and from the reservoir again conducted to the stream, without further diminntion than would he caused hy domestic use, I douht not that a riparian owner could thus use it as against an owner lower down the stream, hut he could not use it for any but domestic purposes, such as the support of animal life in its fullest vigor. He could not use it in any way so as to deprive his neighhor of water for the snpport and comfort of animal life.

Puhlic policy dictates that an element so necessary and useful as water should be fully utilized, hut it must always he used with regard first to the support of animal life and domestic purposes, and the *surplus alone* can he diverted to any other use. From the views above expressed, and the finding of facts filed herein, it follows that the defendants must he enjoined from diverting, in any way, the waters of Franco's creek from the hed of the stream.

THE weather is milder in England and on the continent. At Paris it is thawing, after 30 days of frost, during which the thermometer touched 8° below zero. It was the coldest weather on record there.

AN appalling railway disaster occnrred last Sunday in Scotland. The hridge over the Frith of Tay was wrecked hy a gale while a passenger train was crossing, plunging the cars into the sea, and drowning over 90 persons.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention :

OVERALLS.—Isidor Lowonberg, S. F. No. 222,921. Patented Dec. 23, 1879. This inven. tion relates to certain improvements in the manufactnre of overalls, pants and other similar garments, bnt it is especially adapted to overalls which are of coarse, strong material and adapted for outside wear. It consists in the combination of a peculiarly shaped waist band, either with or without re-enforcing projections for tbe pocket openings, with a peculiarly curved back strap in two pieces, and cut independent of the waist band, tbe froe ends of said strap being nearly or quite horizontal, while tbe opposite ends curve upward and backward beneatb the waist band.

FRUIT DRIERS.—Geo. W. Dietzler, S. F. No. 222,874. Patented Dec. 23, 1879. This device relates to improvemonta in the construction of air-heating furnaces; in the application of said furnaces to the evaporation of the moisture from vegetable and othor substances, and the warming and ventilation of apartments, and also in a methed of supplying tbe combustion in tbe firo-box with air taken from tbe top of the evaporating chamber, or from near tho floor of apartments.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments :

Northern Belle, Dec. 20th, $9,953.38; Nortbern Belle, Dec. 22d, $6,833.14; Standard Con., Dec. 23d, $37,158.55; Belmont, Dec. 22d, $4,393; Belmont, Dec. 26th, $2,671; Bodie Con., Dec. 29th, $16,466; by Stage from Butte, Southern Montana, sbipped during Nov., $102.232; Richmond M. Co., Dec. 25th, $21,292.38; Dec. 28th, $8,554.23; Con. Virginia, Dec. 29th, $109,367; Union Con., $28,173.33.

A BERLIN correspondent of the *Morning Post* says he is authorized to contradict the rumors that a revival of an alliance between the three Emperors is contemplated. The correspondent also denies tbat any alterations are at present intended in protective tariff.

AN organization has hcen formed by the victims of Duncan (the ex-banker,) to prosecnte him, and if possihle, prevent him escaping State prison. Chief Jnstice Wallace has refnsed to rednce his bail below $113,000.

AT a meeting of the Skagit Trail Committee, bids were received for the construction of a pack trail from the head of navigation on tbe Skagit river to the new gold mines.

A NEW mining exchange has been formed in New York. The new Board is to be governed by similar rnles to the San Francisco and other stock exchanges.

THE North Bloomfield mining company have elected Thomas Bell, L. L. Robinson, Michael Castle, A. Locan and Thomas Brown as Trustees.

EVERY new snbscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, sbould write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of otbers.

A Good Article.

The last number of tbe MINING AND SCIENTIFIC PRESS has a good article on "Lucky Cuss Hill," from the pen of W. H. Seamens, our United States Deputy Revenue Collector. The article is accompanied by a diagram of the principal mines on the hill, which is a credit to the getter up. The article is well written and, like many other communications from Mr. Seamens, will draw favorable attention to Arizona mineral.—*Arizona Daily Star.*

A Cylinder Preeeman

Of good experience wants a situation in a S. F. or interior office. Understande running an engine. For a steady situatlou will accept moderate wages. Address "No. 2," this office.

An Engineer

Wante a eituation to run a stationary engine in ths city or country. Will accept a moderate salary. Address "No. 1," this office.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

BOUND VOLUMES OF THE PRESS.—We have a few sets of tbe back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

SAMPLE COPIES.—Occasionally we send copies of thie paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending ite circulation. We call the attentiou of such to our proepectus and terms of subscription, and requeet that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

TUESDAY M., December 30, 1879.

CANDLES.

Crystal Wax	17 @17½
Eagle	12 @—
Patent Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits.

2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75

Merry, Fsull & Co.'s.

Preserved Beef.

2 lb. doz	3 75 @4 00
do Beef, 4 lb.doz	6 50 @ —

Preserved Mutton.

2 lb. doz	3 50 @3 62½
Beef Tongue	6 25 @ —

Preserved Ham.

2 lb. doz	6 00 @ —
Devilled Ham, 1 lb. doz	4 50 @ —
do Ham, ½lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	3 75 @ —
2 lbs	2 75 @ —
Spiced Fillets, 2 lbs	3 75 @ —
Head Cheese, 3 lbs	3 75 @ —

COAL—Jobbing.

Australian, ton	6 50 @ 7 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 6 00
Cumberland	13 00 @15 00
Mt Diablo	4 75 @ 5 75
Lehigh	11 50 @12 00
Liverpool	6 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	7 50 @— —
Wellington	— @ 7 00
Charcoal, sack	75 @— —
Coke, bush	60 @— —

COFFEE.

Sandwich Id, lb	— @—
Costa Rica	18 @ —
Guatemala	18 @ —
Java	25 @— 26
Manilla	17 @— —
Oreund, in cs	25 @— —

FISH.

Sac'to Dry Cod	2½@ —
do in cases	3½@ —
Eastern Cod	— @— —
Salmon, hbls	7 00 @ 7 50
Hf bbls	3 50 @ 4 00
1 lb cans	1 40 @ 1 50
Pkld Cod, bbls	— @— —
Hf bbls	— @— —
Mackerel, No. 1	
Hf Bbls	9 50 @10 00
In Kits	3 00 @ 3 25
Ex Mess	3 50 @ 3 75
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	50 @— —

LIME, Etc.

Plaster, Goldeu Gate Mills	3 00 @ 3 25
Land Plaster, da	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Oement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50

NAILS.

Asarted sizes, keg 4 25 @ 4 75

OILS.

Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 30 @ —
do, No. 2	1 20 @ —
Baker's A A	— @1 30
Olive, Flagnlol	5 25 @5 75
Pomel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	85 @ —
Boiled	90 @ —
Cocoanut	10 @ —
China nut, cs	72½@ 73½
Sperm	1 40 @ —
Coast Whale	35 @ 45
Polar	— @ 45
Lard	80 @ 90
Oleophine	@ —
Devoe's Brill's	16 @ 17½
Photolito	— @ —
Nonpariel	— @ —
Eureka	19 @ 20
Barrel kerosene	20 @ —
Downer Ker	30 @ —
Elaine	34½@ —

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal.	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60

RICE.

China, Mixed, lb	4½@ —
Hawaiian	6½@ —

SALT.

Cal. Bay, ton	17 00 @24 00
Common	10 00 @12 00
Carmen Id	12 00 @25 00
Liverpool fine	18 00 @— —

SOAP.

Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	47½@ 50
Cassia	19 @ —
Nutmegs	97½@1 10
Pepper Grain	14 @ 15
Pimento	19 @ 20
Mustard, Cal, ½ lb glass	— @1 25

SUGAR, ETC.

Cal. Cube, lb	— @ 12
Powdered	— @ 12½
Fine crushed	— @ 12
Granulated	— @ 11½
Golden C	— @ 10½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	25 @ 30

TEA.

Young Hyson, Moyune, etc	40 @ 65
Oonong pckd Gunpowder & Imperial	35 @ 75
Hyson	30 @ 35
Fooo-Chow C	27½@ 32½
Japan, 1st quality	40 @ 60
2d quality	25 @ 40

METALS.

(WHOLESALE.

TUESDAY M., December 30, 1879.

IRON.—

American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	— @ 8
Norway, according to thickness	7 @ 8

COPPER.—

Sheathing, lb	22 @— —
Sheathing, Yellow	18 @— —
Sheathing, Old Yellow	8 @— —
Nails	25 @— —
Bolts	24 @— —
Brazier's, in all sizes	24 @ 30
Old	16 @— —

STEEL.—

English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —

TIN PLATES.—

10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17

ZINC.—

By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10

NAILS.—

Assorted sizes	3 50@4 50

LUMBER.

TUESDAY M., December 30, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	14 00
Surface	24 00
Rustic	24 00
do, No. 2	18 00
Flooring	24 00
do, No. 2	17 00
Beaded Flooring	23 00
Refuse	20 00
Half-inch Siding	20 00
Refuse	16 00
Half-inch Surfaced	24 00
Refuse	18 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

REDWOOD.

RETAIL PRICE.

Rough, M	18 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	25 00
do, No. 2	17 00
Rustic, No. 1	25 00
do, No. 2	18 00
Battens, lineal ft	
Shingles M	2 00

PUGET SOUND PINE

RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Laths	3 50

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending December 30, 1879.

HIGHEST AND LOWEST BAROMETER.

Dec. 24	Dec. 25	Dec. 26	Dec. 27	Dec. 28	Dec. 29	Dec. 30
29.568	30.620	30.323	29.955	29.907	30.031	30.321
29.437	30.417	30.064	29.748	29.756	30.200	30.458

MAXIMUM AND MINIMUM THERMOMETER.

44	45	47	47	43	47	49
34	37	37	36	42	30	30

MEAN DAILY HUMIDITY.

32.7	57.3	69.7	78	87	73.7	81.3

PREVAILING WIND.

NW	N	NW	N	N	N	N

WIND—MILES TRAVELED.

491	241	119	115	62	62	59

STATE OF WEATHER.

Clear.	Clear.	Clear.	Cloudy	Fair.	Clear.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

			.23			

Total rain during the season, from July 1, 1879, 9.30 in.

Mining and Other Companies.

Persons interested in incorporated sharee will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Butte Hydraulic Mining Company.—

Location of principal place of business, San Francisco, California. Location of worke, Butte County, Cal.

NOTICE.—There are dslinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Poirson	13	2½	$25 00
L Lapierre	22	2½	25 00
H Marcoux	24	2½	25 00
J B Lussier	25	2½	25 00
John Britt	26	2½	25 00
Geo W Deitzler	37	5	50 00
N Desautelle	41	2½	25 00
Joe Lucier	42	2½	25 00
N Goldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervale	45	10	100 00
Geo Moreau	46	5	50 00
Geo W Deitzler	47	15	150 00
A S Hawee	17	10	100 00
J Callandreau	4	10	100 00
A M Wilder, Trustee	1	10	100 00
A L Lengfeld	5	5	50 00
L L Deunery	6	5	50 00
W E Lutz	7	5	50 00
Geo. H. Powers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1870, eo many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francieco California, on Monday, the 22nd day of December, 1879 at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertieing and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 3, No. 220 Saneoms St., San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Butte Hydraulic Mining Company le postponed to the Fifth day of January, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the 24th day of December, 1879, an assessment (No. 40) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the First day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. C. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Mariposa Land and Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 10th day of December, 1879, an assessment (No. 17) of Fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. currency to the Secrtary, at the office of the company, room 33, Nevada block, No 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of January, 1880, will be delinquent and advertised for sale at public auction; and unless payment is made before will be sold on the 2d day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

LEANDER LEAVITT, Secretary.

Office—Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, California.

Numa Mining Company.—Location of Prin-

cipal place of business, San Francisco, California. Location of worke, Humboldt County, Nevada.

NOTICE.—There is delinquent upon the following described stock on account of assessment (No. 2) levied on the 23d day of October, 1879, the several amounts eet oppoeite ths names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Alexander, E W	43	2000	$40 00
Blaedel, E W	15	250	5 00
Blasdel, E W	16	250	5 00
Blasdel, E W, Trustee	27	500	10 00
Blasdel, E W, Truetes	28	500	10 00
Blasdel, E W, Trustee	30	500	10 00
Blasdel, E W, Trustee	31	500	10 00
Blasdel, E W, Trustes	45	250	5 00
Blasdel, E W, Trustee	46	250	5 00
Blasdel, E W, Trustee	47	500	10 00
Blasdel, E W, Trustee	49	500	10 00
Blasdel, E W, Trustee	50	2500	50 00
Blasdel, E W, Trustes	51	4000	80 00
Blaedel, E W, Trustee	64	250	5 00
Brown, George A	42	500	10 00
Burne, A M	23	7500	150 00
Burns, A M	55	500	10 00
Burne, A M, Trustee	56	2500	50 00
McKusick, H J	44	4000	80 00
Merry, D B	65	500	10 00

And in accordance with law and an order of the Board of Directors, made on the 19th day of November, 1879, eo many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 328 Montgomery street, room 21, San Francisco, California, on Monday, the Twelfth day of January, 1880, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with coete of advertising and expeneee of sale

DAVID WILDER, Secretary.

Office—328 Montgomery St., room 21, San Francieco, California.

ANNUAL MEETING.

Gila Silver Mining Company.

The Regular Annual meeting of the GILA SILVER MINING COMPANY will be held at the office of the Company, room 7, Safe Deposit Building, 328 Montgomery St., San Francisco, California, on Monday, the Twelfth day of January, 1880, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors to eerve during the eneuing year, and the transaction of each other business as may coms before the meeting. Transfer books will close on Monday, the Fifth of January, 1880, at 12 o'clock M.

WM. W. PARRISH, Secrstary.

Office—Room 7, Safe Deposit Building, No. 328 Montgomery strest, San Francisco, California.

ANNUAL MEETING.

Consolidated Virginia Mining Company.

The Annual meeting of the stockholders of the CONSOLIDATED VIRGINIA MINING COMPANY will be held at the office of the company, rooms 26 and 27 Nevada Block, San Francisco, California, on Thursday, the Eighth day of January, 1880, for the election of a Board of Trustees to eerve for the ensuing year, and the transaction of each other business as may properly come before the meeting. Transfer booke will cloeo on Saturday, December 27th, 1870, at 12 o'clock, noon, and remain cloeed until after tbe meeting.

A. W. HAVENS, Secretary.

San Francisco, December 22, 1870.

ANNUAL MEETING.

NORTHERN LIGHT GOLD AND SILVER MINING Company. The annual meeting of the stockholders of the above-named Company, for the election of Directors, and the transaction of any other business that may properly come before it, will be held on MONDAY, the 5th day of January, 1880 (first Monday in January), at the hour of one o'clock P. M., on that day, at the office of the Company in this city, Room 30, No. 310 Pine street, San Francisco, Cal. Transfer Books will be closed Monday, December 29th, 1879, at three o'clock P. M.

F. S. MONROE, Secretary.

Patents for Mining and Farming Lands.

Having complete arrangements with competent and reliable parties in Washington City, by which wo are able to secure prompt and careful attention to law business there, we are prepared to assist Mill and Mine, Canal and Ditch owners in securing patents for their lands, mines and claims, in addition to our general line of patent business.

Many who are acquainted with the manner in which this business has heretofore been conducted, (witb or without assistance by local attorneys), will see at once the great advantage of patronizing an establisbment that is thoroughly organized and has its representatives in Washington to look after and prosecute their applications before the Commissioner of the General Land Office. The business on this Coast will be attended to personally by a member of our firm, and satisfaction will he given in all respects.

Correspondence from persons desirous of securing patents for Lands, Mines, Mill Sites, Canal and Ditcb property, promptly attended to.

Applicants for patents for mining and farming land, whose claims have been delayed for any reason, will find it to tbeir advantsge to consult with us and in case of necessity secure the services of our bome and Washington branch agency.

DEWEY & CO.,

Solicitors of Patents for Lands, Mines and Inventions, MINING AND SCIENTIFIC PRESS OFFICE, No 202 Sansome St., San Francisco.

The Large Circulation of the MINING AND SCIENTIFIC PRESS extends throughout the mining districts of California, Nevada, Utah, Colorado, Arizona, Idaho, Montana-British Columbia, and to other parts of Nortb and Soutb America. Established in 1860, it has long been the leading Mining Journal of tbe continent, its varied and reliable contents giving it a character popular with both its reading and advertising patrons.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE ..... Manager.
CHAS. H. GOODWIN ..... Treasurer.
J. P. CHAPMAN ..... Ascietant Treasurer.

NEW BABYLON.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

STANDARD THEATER.

M. A. KENNEDY ..... Proprietor

HERRMANN AND THE LORELLAS.

Box office, for sale of reserved seats, now open.

BUSH STREET THEATER.

CHAS. E. LOCKE ..... Lesece and Manager

COLVILLE OPERA BURLESQUE CO.

Open every evening and Saturday Matinee.

CALIFORNIA THEATER.

BARTON & LAWLOR ..... Manager.
BARTON HILL ..... Acting Manager.

THE SEVEN SISTERS.

Buch Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS

and **MACHINERY**

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St. (rear of Ætna Foundry),

J. V. HALL,

PRACTICAL BOILER MAKER.

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK, Repairing promptly attended to at the lowest possible terms.

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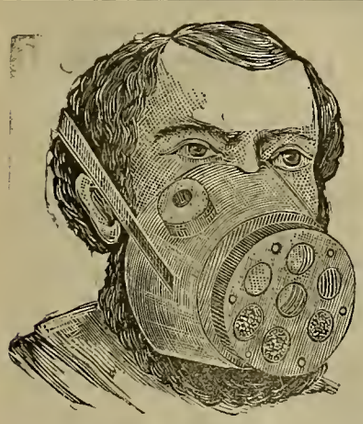

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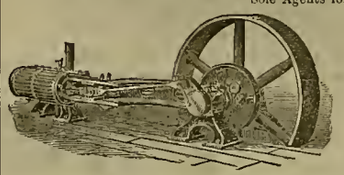

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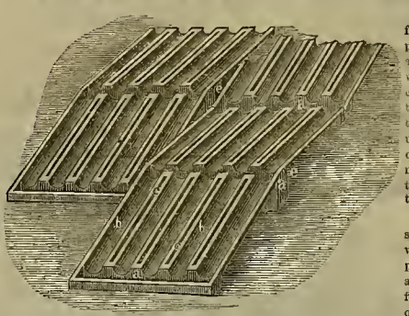

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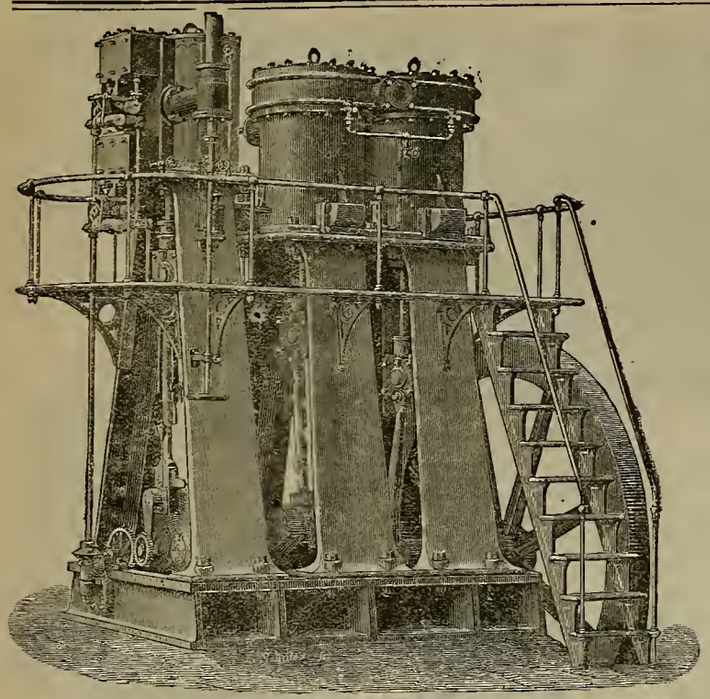

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MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

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New Book on the Comstock.

The attention of MINING ENGINEERS and EXPERTS is called to the new work by JOHN A. CHURCH, E. M. Ph. D., on "The Comstock Lode, Its Formation and History." This very exhaustive treatise on this famous lode is fully illustrated with diagrams and colored charts showing sections, ore bodies, etc., and will be of great interest and permanent value for reference. DEWEY & Co., Publishers of the MINING AND SCIENTIFIC PRESS, are sole agents for the sale of the work. Mr. E. M. SLEATOR will act as their agent, and call on Mining Engineers and those interested in the great lode in this city with a copy of the book for their inspection.

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VOLUME XL Number 2.

The Clayton Air Compressor.

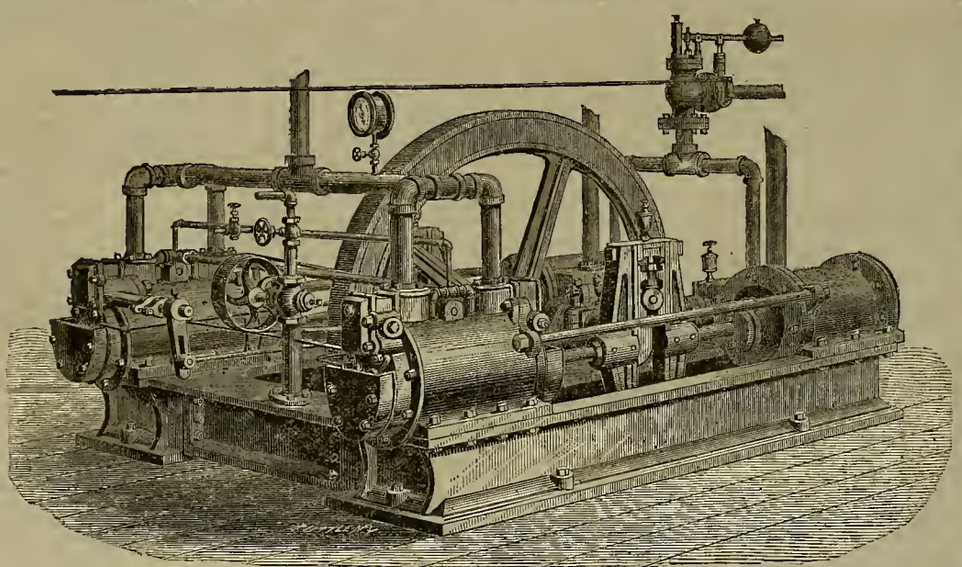
We have the pleasurs of prssenting this week to the rcaders of the PRESS an illustration and dscription of an improvsd air compressor, built by sn Eastern manufactursr, whose skill, in adapting his specialties in machinery to ths requirsments of different locations and special pnrposes for which employed, has long bssn recognized and appreciated in the more immediate neighborhood of tho manufactory, and also on our own Pacific coast.

While adding much to the value of the air-compressing mecbauism, a general design of machine has been closely adhered to, which has been favorably known to ths public for sovsral years.

In the transmission of power from the steam cylinder to the fly-wheel, which in this case is used only to equaliza ths motion and strains consequent upon the different positions occupisd by ths crank during the stroke, tho ordinary connecting rod is dispensed with (as seen in ths cut) and a "slotted cross-head" substituted for it, which furnishes a rigid and direct connection between the steam and air pistons and very materially reduces hoth the weight and space required for a given size. The crank-pin hoxes slide up and down in this "cross-head" or yoke, and are provided with an ingenious and efficisnt means of "taking np," at one operation ths wear of both the crank-pin and slides, and furthermore, allows the wear to be tsken up *uniformly* on both sides of ths crank-pin, thus maintaining "uniform clearance" hetween the pistons and each cover of hoth steam and air-cylinders. Ths foot of ths slotted cross-head or yoks is provided with "adjustabls brasses" which rest on a "slipper guide" (not shown in cut) which supports all the weight attached to ths piston rods, between the two cylinder covers, and contributes much to "uniform and true wear" of both cylinder and pistons. These improvements in construction are designed to meet the ohjections hitherto urged against such a method of transmitting power from the piston to the fly-wheel; hut whenever the ordinary cross-head guide bars and connecting rod are preferred, they ars furnished at a small advance in cost. The steam piston is provided with spring rings and approved msans for setting thsm out. The induction and eduction of the steam to the cylinder is controlled by a plain slide valve, properly proportioned, which in turn is actuated by an eccentric on ths main shaft.

In compressing air, a great amount of heat is developed, which, if not conveyed away at each stroke, would scriously retard, and finally stop the working of the compressor. To successfully do this with the smallest expenditure of water (an important item in somo locations), has been one of the problems claiming the attention of those engaged in huilding air compressors. Of tbe three methods of cooling which have successively heen employed, that of circulating cold water through a "water jacket" surrounding the air cylinder, has been generally adopted in Americau practice. While heing governed hy the experiments and experience of the past in the selection of a method of cooliug the air cylinder, the manufacturer of this compressor has certainly made a step in advance, aud in the right direction in its application, and it is claimed accomplishes important results. The degree of heat developed heing proportionate to the pressure, it necessarily follows that the ends of the cylinders are exposed at each stroke to air heated to a much higher temperature than the middle of the cylinder, and under such conditions there would he a tendency to unequal expansion of thc cylinder greatest at the ende and least in the center, whicb we are informed has in prsctice seemingly givsn a permansnt "set" to the mstal. To correct this tsndency, ths cold water is introduced to the "jacket" at each end of the cylinder, travsrsing the cylindsr circumferentially and having its outlet at the csntsr. This brings the watsr first in contact with the "bottest" parts of the cylinder, and as it hecomss gradnally heated by transmission to it of heat from ths metal in contact with it, its flow is dirscted by bridge walls over successive sections of metal lcss hsatcd, and following a wsll-known law, the warmsr water absorhs lsss heat from the cooler metal. It is claimed by this system of "jacketing" that uniform expansion and "sizs of bore" is scoured with no tendsncy to "bind" ths piston in the middle of the stroke and allow leakage at the ends.

Another feature wbich we belisvs is introducsd in connection with air compression for the first tims is that of opening, by a direct and positive connection with the main shaft, of the "delivsry valves" whenever the air in the cylindsr reaches ths same pressure as that in ths "receiver," or pipes that convsy it away. Systsms of "halanced valves" for this purposs which has yet been dsvised have not given very satisfactory results in practice, while for durability and gensrally satisfactory working, none has given so good rsults, under tbe vary-



THE CLAYTON NEW AND IMPROVED DUPLEX AIR COMPRESSOR.

ing circumstances under which compressors are called to work, as a "heat valve." The first rsquisite of any valve is that it shall be, and remain, tight, ths attsinment of which necessitates such a disproportion between the relative area of valve against which the air in tho cylinder acts to lift the discharge valve from its scat, and that upon which the air in the "receiver" or pipes passee tending to confine it to its seat, that in practice the air in the cylinder is compressed up to a pressure from 30% to 50% greater than that constantly maintained in the receiver before it can make its escape. Any compression of the air in the cylinder above the "working pressure" is an absolute waste of power, and eubjects the compressor to eevere and unnecessary strains. In order to retain the "heat valve" with its valuahle features, and at the same time relieve the compressor of unnecessary shocks and strains, a device, in part shown in the illustration, is applied to the air cylinder, positive in movement, which lifts the discharge valve from its seat when the air in the compressor cylinder has reached the pressure maintained in the "receiver" and pipes. Between all the air valves and their respective seatings there is interposed a duplicate valve turned perfectly true, and it will maintain its form nnder the action of the valves, and yet possesses elasticity sufficient to protect the valve and seat.

While it is necessary to use efficient means to keep the oylinder cool, as before explained, it is of the highest importance that both cylinder and piston should bs properly lubricated, and means providsd for expslling all ths compressed air from ths cylinder at the complstion of each half stroke. Any air rsmaining in ths cylinder after ths piston commsnces its rsturn movsment, will re-expand to its original volume and pressuro before any further supply of air will flow in. From this it will be apparent that a very small amount of compressed air unexpelled in ths cylinder will vsry materially *reduce the capacity* of the compressor. To effect the desired lubrication of the cylinder and to fill all waste and clearancs spaces hetwsen ths face of the piston and dischargs valvss, a lubricating cock is arranged between the two air cylindsrs (seen at the left hand of the cut), whioh ie operated by bslt from the shaft.

At the commsncement of each return movemsnt of ths piston this lubricator delivers to the cylinder, through the inlet valves, a measured quantity of oil or water, which remains at the bottom of the cylinder during ths period of air admission, but when the inlet valves close and compression commences it slowly risss, and at the end of the stroke hss filled all the "clearance" and space below the point at which the air is delivsrsd. By a simple arrangemsnt of pipss connscting tbis lubricator with the air receiver (not shown) the same lubricating matsrial may be, if desired, used ovsr and ovsr again indefinitely.

At the right hand of the engraving, placed upon ths steam supply pipes, is Steels' patsnt air governor, which is used exclusively on the compressore and pumps made at the Clayton Stcam Pump Works. This governor is operated hy the compressed air, and may be set to act at any desired pressure by eimply changing the position of the weight on the lever of the governor and will stop the compressor whenever the air pressure exceeds the desired point, readmitting steam when the air pressure falls.

From the foregoing it is apparent that the manufacturer has closely studied the wants of the "trade," and introduced such improvemente which, combined with thoroughly good materials and workmanship, make an air compressor, which, in the hands of practical men, will be descrvingly successful and popular.

These compressors, together with air and steam pumps, are built in a great variety of sizes and forms, single or duplex, to be driven by eteam, water or by beit, and are fully illustrated and described in a circular issued by the manufacturer and patsntee, James Clayton, 14 and 16 Water etreet, Brooklyn, N. Y.

On the island of Mauritiue 20,000 cattle have died of the plague.

Annual Meeting of the Academy of Sciences.

The annual meeting of the California Academy of Sciences was held on Monday ths 5th inst.

Vice-Presidsnt Moore read a report of tbe Academy's progress dnring the past year, and William Ashburner, Chairman of the Board of Trustees, also read a report. Ths annual reports of Chas. Troysr, Librarian; W. G. W. Harford, Director of the Mussum, and Elisha Brooks, Treasurer, were also read. The report of ths Secretary, Charlcs G. Yale, ehowed rescipts amounting to $11,129.92 during the year, comprising $4,000 borrowsd from the Bank of California to pay taxes, $3,445 from the Market street property, $1,707.50 dues, and $400 from rent of the hall. Ths dishurssments aggregated $11,152.87, embracing $2,120 paid the bank, and $5,522 taxes and sundry othsr matters. The taxes referred to are on ths Market-street property, given to the Academy by the late Jamss Lick. Ths taxes have hitherto exceeded the income from rents, so the property has been a dead weight to the Academy.

A vots of thanks was passsd to Mr. Yale, Secrstary, for gratuitously performing the duties of his offics both for the Academy and to the Trustees; and to Mr. S. B. Christy as corresponding Secretary. A vots of thanks was also passed to both of these gentlemen, in conjunction with Messrs. Dewey & Co., publishers of ths SCIENTIFIO PRESS SUPPLEMENT, for the preparation and publication of papers read before the Academy. It was shown that had not Messrs. Dewey & Co. given space in ths SUPPLEMENT to the papsrs read before the Academy, the work of the members could not have been published.

Messrs. W. A. Wallace and J. B. Swecnsy were elected resident members; and Messrs. A. T. Dewey and W. B. Ewer were proposed for membership. The Secretary read for Prof. Davidson, in his absence, a paper on the Solar Eclipse, which we give in another column. Ths officers elected at the ballot held during the day to serve during the year 1880 were announced as follows, all incumbents heing re-elected: President, George Davidson; First Vice-President, J. P. Moore; Second Vice-President, Hermsnn Bshr; Recording Secretary, Charles G. Yale; Corresponding Secretary, S. B. Christy; Treasurer, Elisha Brooks; Librarian, Charles Troyer; Director of Museum, W. G. W. Harford; Trustees—William Ashburner, R. E. C. Stearns, George E. Gray, B. B. Redding, Thomas P. Madden, Ralpb C. Harrison and J. M. McDonald.

A GOVERNMENT MINING COMMISSION.—A joint resolution has becn introduced in Congrese by Page, providing for the appointment of a commission to investigate the debris question in California, to he known as the Commission on Mines and Mining, to he composed of five members, three to be designated by the Secretary of War from officers of the Corps of Eugineers of the United States Army, one of whom at least shall have eerved and resided within the State of California, and two to be designated hy the Secretary of the Treasury from officers of the Coast Survey. Said commission shall institute such scientific and practical examination into the eystem and operations of hydraulic and other kinds of mining, in their relations to the navigahle waters of California and agricultural lands adjacent to the streams receiving the deposits of said mines, as may he considered necessary for the discovery of some practicahle and feasihle method for the protection of the rivers aforesaid and the lands otherwise affected by the mining operations of the State.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Something About Jute.

Editors Press:—I am frequently asked for information on the culture of the jute plant and the preparation of the fiber; where seed is to be had, etc. With your permission I will take this method of giving what information I have on the subject through medium of the Press. I have never seen jute in cultivation; all that I know about it has been gained by correspondence and the reports of the Agricultural Department at Washington, from which I infer that the plant can be grown in California to as great perfection as it ever grew in India.

In the year 1870 the Agricultural Department at Washington, distributed jute seed in small quantities through the Southern States. The next year the Department was furnished with favorable accounts of the growth of the plant, but the planters were still at a loss as to the best mode of planting the seed, harvesting the crop, separating the fiber from the stem, etc. Hon. E. H. Derbey of Boston, addressed a letter to Mr. R. McAlister, then residing in Calcutta, and received the following:

The seed is sown in the month of March and April, broadcast on prepared ground, preference being given to moist, high ground situated if convenient on the bank of a river and somewhat sandy. It is not necessary to irrigate the ground, as no more water is required than is sufficient to keep the roots moist. It is allowed to grow three to four months and is cut in the months of June and July and August, when it has attained the hight of eight to twelve feet; the size depending on the soil and season. The time for cutting is just after the flowers have turned to seed and before the seed begins to ripen. When cut, the stalks are tied in small bundles and thrown into tanks of dirty water and allowed to remain there five to eight days to rot, at the expiration of which time they are taken out and the fiber falls from the stalk. It is then hung up to dry, and when dry it is sorted, packed in round bundles called drums, and sent to market. If all the plants were allowed to ripen the yield of seed would be about 120 lbs. per acre. The quantity of seed required to be planted is from 30 to 40 lbs. per acre.

I am not prepared to give information where jute seed can be had at this time, but would suggest that Mr. Sussman, the Secretary of the Pacific Jute Company, San Francisco, would be likely to know and assist in procuring seed.

From other reports I learn that the yield of fiber is from 2,000 to 3,000 pounds per acre, and that the labor and cost is one-fourth that of cotton.

There are several other methods of separating the fiber from the stalk, than the one given by Mr. McAlister, but as yet there is no machine invented to separate the fiber from the stem, for the reason that there has not been any demand for it yet. Jute must be raised in some considerable quantities, and the necessity for a machine be apparent before the attention of inventors and machinists will be generally attracted to it.

The planters have been very cautious about venturing into the cultivation of jute on account of having to compete with the cheap labor of India; but if we are not misinformed it can be made profitable in California where there is a local demand for 20,000 tons per annum, with a fair prospect that within a few years the demand will reach 50,000 or 60,000 tons. Admitting that we use the primitive method of the natives of India, and obtain the fibers by hand labor, we save the freight from India, and duty, commission, insurance, etc. The same people picked the seed from cotton for hundreds of years by hand until American ingenuity made the cotton-gin. It is just as reasonable to suppose that we will invent a machine that will more than compete with the cheap labor of India just so soon as there is a demand for it.

For further information as to the probable profits of jute culture, I refer those who entertain the idea of growing jute to the reports of the Commissioner of Agriculture from 1871 to 1878; there is much information in all the reports.

Prof. Waterhouse of the Washington University, St. Louis, has written a very interesting article on the importance of the culture of jute. After visiting the jute-growing country in India he is well prepared to give information. He says the trials that have been made strengthen hope into an assurance that jute can be successfully cultivated in the Gulf States and in southern California. Again he says, what has been so successfully accomplished in Dundee can be done with a still greater success in the United States. We cannot only spin and weave the fiber, but we can also raise it; we not only can derive the profits of making the fabrics, but we can also enrich ourselves by the twofold economies of the growth and manufacture of the staple. Again he says: During the last five years about 170,000,000 pounds of jute were made into paper in the United States. The newspapers of the United States ought actively to promote an undertaking the success of which would so greatly rebound to their own advantage.

In conclusion I would recommend to those having suitable land and a disposition to try it, that they get seed in quantity enough to make it an object, go at it with the intention of making money and doing a good thing for the State. There is good land to grow jute in Fresno and Kern counties, as well as many thousands of acres elsewhere in the State that will produce it profitably. Wm. H. Rector.

Notes from Richmond Basin, Arizona.

Editors Press:—Thinking perhaps a few items from this locality might interest your readers, will say that in all my traveling and examinations in this portion of the Territory have found in this Basin and the surrounding country a larger and richer amount of ore than I had supposed had been taken from any mines in this belt; and foremost in the ranks is the celebrated Silver Nugget, which has without doubt more ore mined, and on the dumps ready for milling, than any other in the Territory, and for quality, as well as quantity, I think it as good as any, for, as near as I can estimate, there is now somewhere about six thousand tons which will average at the least $75 per ton. This is called second-class ore, the first-class having been sorted out and the most of it shipped, which ranges into the thousands. Having examined the surface, I found that there had been sunk on the property eight shafts, from fifty to one hundred feet deep, and all show a fine body of mineral. Here I found drifts and crosscuts have been run on the vein, and all show good ore. At the depth of fifty feet the crosscut west is twenty feet long, and still in ledge matter. A crosscut east of twelve feet is still in ore, so that the width is hard to determine, making the Silver Nugget one of the most valuable properties I have found since I have arrived here.

At the northeast of the Nugget is the McMorris, which has been purchased by some Eastern men. Here we find ore as rich as anyone could ask for, and in goodly quantities. This has never had but little work done, for the reason that at a small depth water was encountered, and the former owners' means wouldn't allow the purchase of machinery for raising it. The present owners are starting work with the intention of developing it thoroughly and making a mine of it, and they have all the assurance of having their labor rewarded by a large return of bullion. Adjoining this on the west is the Richmond, and here I find a splendid prospect for the work done. At the present time in the east drift there is a showing of extremely rich ore. This shows a vein of pay ore nine feet wide in this drift and no walls in sight. About one and one half miles southeast of here is the famous Buckeye, which has in sight a large amount of high-grade ore. This has been opened by shafts, tunnels and drifts. One shaft is 235 feet deep and shows a width of ledge of ten feet and three feet of high-grade ore, some having native silver. This is owned by San Francisco capital, and they have a bonanza.

About two miles west of this there has been found a good prospect in the way of a rich carbonate vein. This is the first ore of this character found in this vicinity, and the owners are hoping for a second Leadville to start up. This is a large, strong vein, and has a splendid formation holding it, and in the gulch, at a distance of three hundred feet, is the most favorable location for reduction works, as there is water here the year around. This location has been selected for the Nugget mill, which has just been shipped from San Francisco, and when that, together with the McMorris, gets to working, am satisfied that this portion of the Territory will have lots of friends. With more anon, will close. Miner.

Richmond Basin, Dec. 23, 1879.

What is the Patent?

Editors Press:—It is perhaps not surprising that patents should be somewhat loosely granted occasionally, for, besides that it is impossible for the examiners to know all that has been done, it may well be supposed they sometimes think that, inasmuch as a patent is not a fixed fact till it has passed the ordeal of the courts, it is as well, when one is demanded by a person who ought to know more of the subject than they do, to take his money, grant the patent, and let him take the chances of maintaining it against anyone who may choose to contest its validity.

No doubt some clearly invalid patents are taken out on the calculation that many people will rather pay a small royalty than incur the expense of a lawsuit; but, really, it is fast coming to this, that it will be dangerous to adopt the most obvious suggestion of common sense, lest it should prove to be an infringement of some patent *wrong*.

The immediate occasion of these remarks is the description of "Hofmann's patented process," in your issue of December 27th. It is difficult to see, in that description, anything which deserves the protection of a patent. Who is to prevent me from treating ore by the Patera process first, and by the Plattner process afterward?

At the works referred to in the description, the ore is first treated by the well-known Patera process, including the roasting with steam, for the extraction of silver, and afterwards by the equally well-known Plattner process for the gold. The mechanical details present nothing new, except possibly the conducting the waste chlorine to the furnace, which is of no importance.

The process, as a whole, is not more novel than was the so-called "Kustel & Hofmann" process for gold and silver, differing from it only in the reversal of the order in which the processes of Plattner and Patera are applied to the ore. It is not more novel than the retreatment of tailings produced by one well-known process, by another well-known process, for the more complete extraction of the contained metals. Is that how Mr. Hofmann's patent reads?

C. H. A.

The Age of Gold.

From a lecture before the "Bullion Club," of New York, delivered by Prof. Benjamin Silliman, the New York *Exchange* makes the following synopsis: He began by referring to the fact that nature holds the original sources of wealth, and that labor only creates values, all effort to create them or exchange them permanently by human law-making being a direct violation of a great natural law. "What is money?" said Prof. Silliman. "There is a substantial agreement that money is a common medium of exchange among civilized nations. The choice of the world from the earliest time has been either silver or gold as money, because these metals demand value: (1) from the labor which it costs to obtain them; (2) they are little liable to injury or destruction by use or accident; (3) they are readily divided into coins of convenient size; (4) their transportation costs only a small portion of their value, and (5) their quantity, although limited, may always be increased by mining to replace the loss arising from consumption and to meet the wants of the growing population of the world. No other known substances possess this collective group of attributes fitting them to be used as money. Platinum was tried by the Russian government some time since without success. The preference for gold as a medium of exchange was because gold possessed the power to resist the ravages of time and the action of chemical substances which destroy silver. The value of bank notes, checks, bills of lading, notes of hand and other substitutes for coin is precisely in proportion to the credit of their maker. Coin sinks into the character of bullion when its purity or standard is tampered with. Prof. Silliman referred in severe terms to the experiment of the government of coining a debased silver dollar, and said: "Legislation is impotent to create values or make 2 and 2 equal 5. History proves that all experiments to discover and put in use any description of circulating medium, except such as has been and is immediately convertible into gold or silver, are disastrous failures."

At the time of the discovery of America the total value of the gold and silver known to exist in the world was estimated at $170,000,000.

The total gold product of America in the 53 years from 1492 to 1545 was $148,400,000.

In 1500 the silver mines of Potosi, Mexico, were discovered, which were destined to produce more than $1,000,000,000 in silver between 1556 and 1803. The stock of gold and silver in commerce about the year 1600 was:

Gold (37%)	£200,000,000
Silver (63%)	340,000,000
Total	£540,000,000

Between 1600 and 1800 the stock of metals was swollen by:

Gold (30%)	£420,000,000
Silver (70%)	996,000,000
Total	£1,416,000,000
Add stock in 1600	540,000,000
Total	£1,956,000,000
Add product from 1800 to 1848:	
Gold	£158,000,000
Silver	450,000,000

On the authority of Humboldt and Chevalier, continued the Professor, the silver production of Mexico and South America was as follows:

From 1545 to 1845 about—	
Bolivia and Peru	$2,580,000,000
Mexico	2,701,000,000
Chile	6,967,249
Total	$5,292,967,249
From 1845 to 1880—	
Mexico	$700,000,000
Bolivia and Peru	245,000,000
Total	$6,237,967,249

The "age of gold" was inaugurated by the discovery of gold in California in 1847. In the 300 years following the discovery of America the influx of silver and gold into commerce from America alone increased the volume of the precious metals previously existing nearly forty-fold in nominal value. The coin in existence at the close of 1809 was £380,000,000. Let us now see how the enormous discrepancy between this sum and the output of silver from America alone previous to 1847 can be accounted for:

American silver and gold production, say	$6,000,000,000
Coin in existence in 1809	$1,843,000,000
Absorbed by Asia	1,700,000,000
Consumed in the arts	1,700,000,000
Wear and tear	106,000,000
Lost or hoarded	651,000,000
	$6,000,000,000

The Asiatic absorption of silver, Prof. Silliman said, was the most remarkable of financial problems. This phenomenon, acting with the great increase of gold during the 20 years following the discovery of California's gold, disturbed the long-established ratio between the two metals, and for a time advanced the silver to a premium in France and other European countries. Dividing the history of the precious metals into four periods, the fluctuation of ratios was as follows: First period, B. C. 1600 to A. D. 312—The ancient relation between silver and gold in the Orient was 1 to 13.33, falling as low as 1 to 8 and 8.93 about B. C. 100, consequent on the increase of gold brought by Cæsar out of Gaul. Second period, A. D. 864 to 1500—The market ratio was 1 to 12. Third period, from 1492 to the opening of the gold mines of California and Australia. Early in the 17th century the ratio rose to 1–15.40; after 1687, down to 1771, it was 1–14.80. In 1550 the production of silver was several times greater than that of gold, and the ratio was 1–11 to about 1–15, but before the close of the 17th century it had reached 1–15.5—the ratio which is still the French standard. Fourth period, 1851 to date—The prediction of many who anticipated a marked fall in the price of gold, consequent upon the enormous increase in the output from 1847 to 1853 were not sustained by the result. In 1851 the ratio was 15–46; in 1852, 15–57; in 1853-54, 15–33; and in 1855, 15–36. After 1864 it began to rise, being in that year 15–40; from 1868 to 1870, 15–60; in 1873, 15–90; and in October, 1874, 16–38. The Professor submitted the following table showing the relative production of gold and silver in the last period:

Years.	Gold.	Silver.
1833–42	£15,000,000	£30,000,000
1843–52	86,000,000	50,000,000
1853–62	257,000,000	82,000,000
1863–72	230,000,000	106,000,000
1873	21,000,000	14,000,000
1874	18,000,000	16,000,000
1875	20,000,000	16,000,000

In 1600 the value of silver to gold was about as 12 to 1; in 1800, about 15½ to 1, while the stock of silver had been increased only about 5%. Prof. Silliman thought that America was destined to be the largest producer of gold and silver in the world. In conclusion, he said that both gold and silver from the earliest times have been adopted by mankind as the most convenient materials for money; that gold properly is recognized as the chief medium of value, but that the principal cause of the depreciation of silver was its demonetization by Germany; and that upon the precious metals alone is it profitable to maintain a bank-note circulation, and it made no matter whether the entire mass of the reserve gold and silver was in coin or in fine bars. "We believe that with a wise course of national legislation, the removal from the United States notes of their legal-tender quality, and the retention of ample reserves of gold and silver, will permanently maintain and renew the financial credit of the nation, and give us, in the best sense of the term, the age of gold."

Formation of Coal.

The Director of the Museum of the Parisian Academie des Scienees, M. Fremy, recently read a paper under the title "Chemical Researches respecting the Formation of Coal," which is of great interest. It is known that coal is produced by the decomposition of vegetable matter, which for many ages covered the surface of the earth. The learned chemist has made a series of analyses, of which he gives an account in his paper, and which have enabled him to establish the laws of this decomposition, and to explain the transformation of the tissues of the vegetable matter into coal by the loss of their organic form.

With reference to peat, the hypothesis has been put forth generally up to the present time of a possible relation between their formation and that of coal. M. Fremy has been led by the same investigations to the conclusion that the peaty formation is, so to speak, the first stage reached by the ligneous tissues before arriving at their complete transformation into coal.

The paper gives the result of investigations on the vegetable tissues which Mr. Fremy has carried on since 1850. Our space will not permit us to give anything but the conclusions drawn from the experiments, which are as follows:

1. Coal is a substance which proceeds from the transformation of vegetable matter, but which no longer preserves its organic form.

2. The vegetable marks which the coal presents are produced by it, as in schist or other mineral substances, and do not prove its organization. This fuel is a bituminous and plastic matter, on which the external features of the vegetation are molded. When a piece of coal presents on its surface, or within its interior, marks of vegetation, it is not to be thence inferred that the adjacent parts are necessarily the result of the alteration of the tissues which were covered by the membranee whose form has been preserved.

3. The principal bodies contained in the vegetable cells, submitted to the double influence of heat and pressure, produce substances which present the properties and composition of coal.

4. The coloring, resinous and fatty matters contained in the leaves are changed, by the action of heat and pressure, into substances which approach very nearly to natural bitumen.

5. With regard to the ligneous tissues at the base of the *cellulose* and the *vasculose*, they are not transformed directly into coal. Before being so changed they pass through a process of peaty fermentation, which produces ulmic acid. It is only in the second place that this ulmic acid is transformed into coal, mingling with all the coal-forming substances produced by the contents of the cells.

Mechanical Progress.

Strength of Wrought-Iron Railway Axles.

At a meeting of the English Society of Engineers, held October 5th, a paper was read on this subject by Mr. Thomas Andrews. The author gave at the outset a brief historic sketch of the Wortley Iron Works, Sheffield, at which works some of the first railway axles used at the commencement of the railway system were made, and, as an interesting fact, he mentioned that these works were supposed to have been established at the time of the Roman conquest. He enumerated a series of practical experiments which he had conducted with a view of showing the great resistance which best fagoted scrap axles are capable of offering to sudden strains, and considered at some length the question of iron *versus* steel as a material for axles. The chief standard tests employed by railway companies and engineers were then given, and their relative merits pointed out. Then followed an account of a large number of experiments on axles manufactured by the author to comply with the various tests. These results tended to show that in some cases the deflection of the axles became less as the number of blows to which they were subjected increased, which it was thought might be due to the heavy blows having a tendency to alter the molecular structure of the iron, and render it more crystalline. From various other experiments which were given, it was shown that the actual quality and tensile strength of an axle might be misjudged, and wrong conclusions formed as to its quality, by solely relying on a falling test. The author strongly advocated one uniform test for axles, and thought that in any correct process of axle testing the amount of testing force actually applied should be measurable, and bear some relative proportion to the greatest amount of shocks to which an axle was likely to be subjected in actual working, and suggested that it would be desirable to obtain, by accurate experiments, an approximate estimate of the work done by the axle in ordinary working, and to arrange some test which could be universally agreed upon.

Welding Steel Hammers.—A correspondent in the *English Mechanic* asks if it is possible to weld a face on a cast-steel hammer. The answer given is as follows: "I suppose to make it heavier; this cannot be done even with sheer steel. Many men will assert that they have seen it done many times. Files may be put together very easy and to look sound, but as to their being welded I doubt it very much. Sometimes old swords can be put together to look sound, still they are not so. Many workmen are not aware that there is a kind of steel made, called welded steel; this will account for so much cast steel being welded. I know one firm that sent an order for 100 tons of sheer steel to one of our best steel makers, and they, not having it in stock, sent welding cast steel, and it gave great satisfaction, and as the order came from a Sheffield firm no doubt it was tested very severely as to its welding property. Of course, the firm it was for took it for sheer steel, and no doubt had the order been for cast steel the same would have been sent, that is if no other was in stock. I have some cast steel and I know it is the right sort, and I should like to give anybody a piece who would try to weld it. I have seen this kind of thing tried in many of our best workshops and by some of our best workmen hundreds of times, and welding files I regard as an old tale."

Composite (or steel-faced) armor plates are rolled at one of the leading Sheffield works, in the following manner: To the iron armor plate to be faced, is attached a frame of iron bars. This frame is capable of holding a quantity of steel, about half the thickness of the iron plate, and, when fixed, is placed in the furnace and brought to a welding heat. On withdrawal the frame is filled with Bessemer steel, and after cooling, is reheated and rolled in the usual manner. The finished plate is iron on the back, while the face is of steel. The *English Mechanic*, describing these plates, declares that their power of resistance is something wonderful. A shot, for example, that pierces a 12-inch iron plate, only makes an indent of from three to four inches in one of the "Composites," and a nine-inch steel-faced plate is affirmed to be equal to a 12-inch iron plate. This fact, it is noticed, will permit of a considerable saving in the weight of armor; and armor-plated ships, thus provided, will be able to exhibit more rapidity in their movements, and will be more economical in their working. H. M. S. *Ajax* is to be supplied with plates made on this principle, some of which will be 16 inches in thickness.

Key-Hole Saw.—The Japanese hand saws cut on the pull-stroke; so no matter how hard the wood or dull the saw, they will not bend or buckle. It is rather more difficult to saw to line with such saws than with ours, but they have their advantages. Take one of our key-hole or compass saws, cutting on the push or shove stroke, what an aggravating, limber thing it is. Now point the teeth the other way, and you have a tool that will keep stiff no matter how many knots it encounters or how dull it gets. In other words, the pull-stroke of 3,000 years ago is the best for such thin, narrow blades.

Care in Emptying Steam Boilers.

In regard to emptying and blowing-off steam boilers, a French contemporary gives the following useful hints: "Those who possess externally-fired boilers, working only by day, have all observed that the fire being covered by night, and the doors closed, the pressure rises during the night, often sufficient to open the valves. This shows that the masonry, being at a much higher temperature than the boiler which it envelops, imparts to it some of its heat. The same effect of heating the boilers is produced, to a less degree it is true, but nevertheless to some extent on the outer jacket of internally-fired boilers. It is, consequently, injurious to empty boilers soon after having stopped them, because after emptying, the plates would be heated by the action of the masonry. It is well to admit a current of air through the flues some hours after the stoppage of the generator, and not to empty it before the flues become cooled to a temperature below 300°. When the flues are not too hot, no serious inconvenience is experienced in emptying the boiler under pressure. We do not say at high pressure, as for a boiler the pressure of which would be 10 pounds, the temperature of the water being 304°, a greater quantity of steam would be generated during the process of emptying; we think at a pressure of two pounds the boiler could very well be emptied. In internally-fired boilers, as there is no masonry to cool in the furnace tubes, it would be well to admit the current of air intended to cool the masonry behind the boiler, as in this case the furnaces would be cooled more rapidly than the jacket. We have sometimes seen owners empty their boilers almost immediately after the fires have been extinguished, clean them with cold water as soon as they were empty, and keep up a current of water so that the workmen might work there. Boilers of small dimensions sometimes resist such treatment, but in large boilers it will be seen that unequal contractions must take place, causing the rivets to burst."

A New Method of Making Steam Boilers. An English engineer named Whitehead, recently exhibited at Owlestan, near Sheffield, a boiler made on a new plan. In making this boiler a ring of steel is cast and heated; then it is placed upon a large roller, and by the aid of smaller rollers it is enlarged to the requisite dimensions. The ring is run from one end of the roller to the other, and is returned by reversing the machinery. The heads necessary for the completion of the boiler are subsequently put on with bolts. The machinery is rather expensive, and it is its cost which is said to be the point upon which the success of the invention hinges. The inventor claims that within six hours he can construct the shell of a boiler of a more durable nature than those now made with iron or steel plates riveted together. There is no doubt that such a boiler must be stronger, as the danger of tearing the seams on the cylindrical surface, where the strain is the strongest, is done away with by the total absence of such seams.

Cast-Iron Magnets.—M. Carre, says the *Revue Industrielle*, has published details of a process he has recently patented for manufacturing magnets in cast-iron. He melts soft metal, very slightly carbureted in the crucibles, and runs it into molds, adding from 10% to 15% of steel filings, according to the degree of carburation, to improve its quality. Good results are obtained by adding to the iron, when melted in the crucible, from 1% to 1.5% of nickel, and 25 to 30 thousandths of copper, or 2% of tin and 50 thousandths of copper. The addition of the copper and tin to the iron facilitates tempering it at comparatively low heat. The quantities of the added metals can be reduced without detriment by tempering at a higher temperature as their proportion is decreased. The best result is obtained by tempering pure cast-iron at as high a temperature as possible short of a degree of heat which would misshape the molded pieces, or expose them to fracture.

The Band Saw Action.—The teeth of a circular saw act at varying angles on the grain of the wood; those at the top of a log being ripped, striking the fibers at a more acute angle, and consequently to better advantage than those at the bottom. The band saw teeth, on the contrary, all meet the fibers at the same angle; and this, as the table is ordinarily arranged, is as squarely across them as is possible. To remedy this, Mr. Pryibil, of New York, inclined the table of one of his band sawing machines about 23½°, so that the board to be ripped was fed uphill, and the teeth met it at a considerable acute angle. He reports that the traction, or effort of feeding, was lessened by one-third, as measured by a spring balance. The cutting action under these circumstances was undoubtedly much more favorable than when the teeth struck square across, but no dynamometrical test was made.

New Kind of Plated Sheet Iron.—In Iserlohn, Westphalia, thin sheet-iron is plated with alloys of nickel or cobalt and manganese. A half of one per cent. of manganese makes cobalt and nickel a very malleable fluid when melted, and ductile. The plates, which are already in the market, are beautifully white and brilliant.

Steel vs. Iron.—Some authorities predict that in a few years steel will supersede iron in naval architecture, to as great an extent as iron has supplanted wood.

Scientific Progress.

The Moon's Shape.

The moon is the nearest, and next to the sun, the most brilliant of all the heavenly bodies; yet it presents more perplexing problems than any other. Whatever theory has been adopted and however carefully worked out, there are deviations and perplexities which cannot be accounted for or explained.

One of the most difficult puzzles appears to be the strong and somewhat peculiar grasp which the earth has upon the moon, differing quite materially from what it should be if that body was a sphere, or as approximately as the earth is to such a form. If we examine carefully a stereoscopic photograph of the moon—and such pictures are very common—it will be seen that the shape bears a much stronger resemblance to an egg, when viewed endways and looking at the smaller end, than to a sphere. By careful observation it will be perceived that there is a careful rounding away of the body of the moon from its point nearest the earth to a certain distance, when the surface appears to fall away in a nearly straight line. When this plane or surface is tilted by libration, first upon the one side and then upon the other, the true perspective can be readily observed.

This peculiarity in its shape may be accepted as an explanation why one side only of the moon is always turned toward the earth. With its longer axis pointed directly to the earth's center, our planet's grasp upon her satellite is so strong as to admit of a diurnal revolution, conformable only to the moon's revolution around the earth—thus keeping the same face or pole of the moon toward the earth—the only variation from this fixity of position being the slight swinging or pendulum motion of the mass, which is known to astronomers as the "moon's libration."

It is by means of this libration that it has been possible to get a true stereoscopic view of the moon. The artist, instead of moving his instrument to get the stereoscopic effect, waits for the moon to move, the change of motion between the one libration and the other, being sufficient for his purpose. In no other way can this peculiarity of shape be made visible to the eye. Instruments, however perfect, fail in this direction. Proctor says: "It need hardly be said that no instrumental means in our possession can show the ellipticity of the lunar disk."

How this peculiar shape was brought about is explained in the following manner: "When the moon was a molten mass the centrifugal force at the equator was so slight that there was no bulging, but the earth's attraction drew out the mass, lengthening it in the direction of the polar axis, and keeping that axis forever directed towards the earth's center."

Where the Cold Waves Come From.—Meteorological observations have now become so extended that evidence is rapidly accumulating to enable us to determine positively the source of the cold aerial waves which sweep across our country during the winter season. The indications are that we owe them to the great area of high barometer in northeastern Siberia, where the pressure sometimes exceeds 31.50 inches, and the temperature falls as low as 76° below zero. The pole of greatest cold is in the neighborhood of Yokutsk, on the Lena, where the average thermometric reading in January of 41° below zero, and where the severest cold exceeds by 10° that experienced by explorers in high arctic regions. This is also the region of the highest barometric pressure known in winter; and from it, doubtless, proceed the waves of intense cold which play so large a part in our winter experiences.

Fish Killed by Electricity.—A correspondent of *Land and Water* says: A curious incident of the whole of the occupants of a small fish pond being destroyed by a flash of lightning, is reported from Seck, Grand Duchy of Nassau. The *Nassauer Bote* states that during a very heavy thunder and hail storm at night time, a flash of lightning struck a small pond, well stocked with various kinds of fish, the property of the pastor of the parish. The following morning the whole of the fish were discovered dead upon the surface of the water. They had all the appearance of having been half boiled, and crumbled to pieces at the least touch, just as is the case with fish after being boiled. Neither any external nor internal injury could be observed, the scales being intact and the swimming bladder filled and well preserved. The water in the pond was still muddy and dull the morning after the storm, as if the lightning had only then struck it.

Thermo-Electric Steel Tests.—Carl Barus has studied the thermo-electric disposition and the electric conductivity of steel, in their relations to the hardness of the steel. He finds that if a steel rod of uniform known hardness is broken in two and the two original ends connected with a galvanometer, the hardness of pieces of steel can be readily tested. For if the free ends of the test rod are laid on the sample of steel which is to be tested, and either point of contact is heated (*e. g.* with a small jet of steam), the thermo-current will flow from the test-rod if it is harder, and to the rod if it is softer than the sample.—*Wied. Ann.*

Changes in the Appearance of Jupiter.

Writing with reference to the strange belt on Jupiter, in a communication to the *Scientific American*, dated September 28th, Mr. J. A. Brashear, of Pittsburg, Pa., says: "I first saw it at 2:45 A. M. on the 26th of June. A nine-inch silvered glass Newtonian telescope was used in this observation. The belts on the equator were of a beautiful pinkish brown color. The broken belt noticed by your correspondent was so vivid and clear that it reminded me of a coke fire seen on a dark night. It made such an impression on my mind that I at once made a sketch of it, which has been of great value in subsequent observations. In referring to my note book I find I have eight drawings of the planet since the above date. Comparing the last drawing with the previous ones, I am led to believe that the spot has slowly diminished in size, though not in general outline. Another and still more strange phenomenon has occurred, and to this I should like to call the special attention of observers. In my drawings I have located the white spots plainly visible between the equatorial belts, and by comparing the consecutive sketches I find that either the spots or the red belt has shifted in reference to one another about one-fourth the length of the red belt.

"Any one who has read Camille Flammarion's interesting article on Jupiter in the last number of your supplement, will see that this shifting of the spots is no new thing, but the question is, Which belt or spot has shifted? I am inclined to think, with my esteemed friend, Mr. F. W. Very, assistant to Prof. Langley at the Allegheny Observatory, that it may be some terrific action is going on in a local spot beneath the red belt which has dissipated or torn away the vaporous envelope of the planet over the place of local disturbance, and we possibly see the *actual surface of the planet* beneath or through the rift in the vaporous envelope. If this conjecture be true, then it is more than likely that the shifting has been in the white spots beneath the equatorial belts, as the local action which gives us the red belt would hardly be of a shifting character. I have used 6.5-inch, 9-inch and 12-inch aperture silvered glass telescopes, and 4-inch and 13-inch achromatics, at different times of observation, and have had some exquisite views of this marvelous planet and its attendant panoramic phenomena."

Action of Ammonia on Brass.

John Y. McLellan, of Glasgow, writes to the *Chemical News* as follows: While experimenting on the action of liquor ammonia on various metals and alloys, with a view to determine the most suitable for the contraction of a certain part in an ammonia plant, I have met with a reaction on brass which, so far as I know, has not before been recorded, and of which this note is a preliminary notice. If a small piece of brass or a few brass turnings be covered with liquor ammonia, specific gravity 0.880, in a closely-fitting stoppered bottle, and placed aside for a few days, it will be found that the ammonia has acted on the copper of the brass to such an extent as to produce a solution of a more or less characteristic violet color, due to the presence of oxide of copper held in solution by ammonia. If this solution be still allowed to remain undisturbed for a few days longer free from contact with the air, this violet color will gradually disappear, leaving a colorless solution, which, however, is no sooner brought into contact with the air by removing the stopper than the violet color is reproduced, and by again stopping the bottle and leaving it aside the same reaction occurs and may be reproduced over and over again.

The production of the violet color from a colorless solution on exposure to the air does not seem to be the result of oxidation, as on opening the bottle in an atmosphere of carbonic acid the same reaction takes place.

I am at present working up this subject in the hope of finding in what state this colorless solution of copper exists.

Proposed Adoption of the Egyptian Cubit. In noticing the labors of the International Bureau of Weights and Measures, Abbe Moigno regrets the choice, as unit of measure, of the ten-millionth of a meridinal quadrant, "a unit fatally indeterminate," since the meridians vary in length. He suggests, as a better standard, the cubit of the Great Pyramid, which represents the ten-millionth of the earth's polar axis. Sir John Herschel made the same proposal, nearly thirty years ago, and it is somewhat remarkable that his views should be now advocated by a leading French scientific journal.—*Les Mondes.*

The Earth's Day Increasing.—In a recent lecture on "Eclipse Problems," Prof. Charles A. Young, of Princeton, said, with reference to the observed increase in the rapidity of the moon's motion, that the discovery led at first to the opinion that the moon's orbit was growing shorter, and that ultimately the moon would come down upon us. More accurate calculation, however, shows that there is no danger of so disastrous a result. The moon is not coming nearer, but our day is growing longer, owing to the friction of the tides upon the earth's surface. The tides act like a brake, and slowly diminish the speed of the earth's rotation.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 18.		Week Ending Dec. 24.		Week Ending Dec. 31.		Week Ending Jan. 8.	
Alpha	9	8	7¾	6	9¼	8¼	11¾	10
Alta	3¼	2.60	2¾	1.80	3.15	2.60	4¼	2.95
Andes	70c	45c	35c	25c	45c	30c	1	45c
Alpa								
Argenta	1¼	1	1.05	95c	1.15	1	1.55	1.30
Atlantic								
Aurora Tunnel								
Baltimore Con								
Belcher	1.80	1	2¼	1.70	4.10	2.00	6¾	4¼
Belmont	85c	50c	80c	75c	65c	70c	1	70c
Best & Belcher	11¾	6¾	9¼	7¾	10¾	10	14¾	10¾
Bullion	4.10	3.60	3.70	2¼	3.70	3¼	5	3.80
Bechtel	1.55	1.30	1.35	1	1	1	1.30	1¼
Belle Isle	1¼	1¼	1¼	1.20	1.45	1.30	1.55	1¼
Bodie	9	6¾	8¾	8¼	9¼	9	9	8¾
Benton	1¾	1.45	1.45	85c	1¾	1.60	2.90	1.65
Bulwer	9¼	8¾	9¼	8¾	9¼	9¼	9¼	9¼
Boyle								
Black Hawk	50c	25c	50c	40c	60c		1	45c
Belvidere	1¾	90c	60c	50c	75c	60c	1	80c
Booker	70c	50c	50c	30c	45c	40c	50c	35c
Caledonia	1.40	90c	1.30	70c	1¼	1.05	1¼	1.45
California	4.40	3.80	3.35	2.70	4.10	3.90	4.40	3.95
Challenge	2	1.55	3¼	1¼	1.90	1.70	2.10	1.80
Chollar	6¾	5¾	5¾	4¾	6	5¾	8	6
Confidence	3	6¾	7	6	6¾	6¾	6¾	7¼
Con Imperial	60c	35c	40c	25c	45c	35c	65c	45c
Con Virginia	4.70	3.95	3.90	3	4	3¾	5	4
Crown Point	2	85c	2	1.45	2¼	2.40	4¾	3.15
Con Washoe								
Champion	20c	15c	20c	10c	15c	10c	20c	10c
Concordia	25c	20c			50c		50c	25c
Dayton								
DeFrees								
Daney	1	80c	95c	70c	75c	65c	70c	65c
Day	19¼	15¾	17	16	16¾		16¾	16¾
Eureka Con	3.10	2¾	2¾	1¾	3	2¾	3¾	2.90
Exchequer	75c	70c	65c	60c	60c	40c	40c	35c
Gen Thomas								
Grand Prize	75c	30c	50c	30c	1		1¼	1.15
Gila	20c	15c	15c	5c	10c		10c	
Golden Chariot								
Golden Terra	12	10	12		12	10	11	10¾
Goodshaw	10c		10c	5c			35c	15c
Gould & Curry	5¾	4	4¾	3¾	5¾	4¾	7	5¾
Hale & Norcross	3¾	5¾	6¾	5	6¾	6	9¼	6¾
Hillside	1¾	85c	1¾	65c	1.40		1¾	1.40
Highbridge								
Homestake								
Hussey								
Independence	75c		80c	75c	1		1¾	
Julia	1	50c	1.80	50c	2	1.55	2.60	1.95
Justice	1.40	1	1	60c	1.70	1¼	2.60	1¾
Jackson	4	3¾	3¾				3¾	
Joe Scates								
K K Con	6	4¾	5¾	4¾				
Kentuck	3	2¾	2¾	2¼	3	2¾	4¾	3.30
Kossuth	10c						90	
Keystone								
Lady Bryan	35c	25c	30c	10c	20c	5c	30c	15c
Lady Wash	60c	45c	50c	30c	50c	45c	65c	50c
Leopard	15c		15c	10c	15c		15c	
Leviathan	50c	25c	30c	20c	45c	30c	40c	30c
Leeds	55c	40c	40c				50c	
Lee								
May Belle							15c	10c
Modoc								
Manhattan	1¾		1¾		1¾		1.30	1¾
Martin White	90c	50c	60c	50c	60c	50c	75c	60c
McClinton	50c	35c	40c	35c	50c	40c	50c	40c
Meadow Valley								
Mexican	20	16	17¾	15¾	18	15¾	22¾	17¾
Miles								
Morning Star								
North Con Virginia								
New York	35c	25c	25c	10c	35c	20c	50c	30c
Northern Belle	6¾	5¾	6¾	6	6¾		8	6¾
New Coso								
Navajo	30c	25c	25c	20c	25c		75c	25c
Occidental	1	90c	50c	25c	1	60c	1.60	1
Ophir	21¾	18	18¾	15¾	20	17	21¾	19¼
Oriental	35c	25c					1	15c
Overman	4¾	3¾	3.70	2¾	6¾	5¾	8¾	7
Panther								
Phenix								
Phil Sheridan	25c	20c	20c					
Potosi	3.65	2¾	2.90	2¾	3	2.80	4¾	3
Prospect								
Raymond & Ely	1	75c	90c	70c	90c	1	1	90c
Richer								
Rock Island								
Rye Patch								
Rough & Ready								
Savage	7	4.05	4.80	3.85	6	4.35	7¾	5¾
Seg Belcher	15	10	12		14	11	19	15
Sierra Nevada	28	20½	22		25	18¾	27	19¾
Silver Hill	1	70c	80c	35c	1	70c	1	75c
Silver King	4	3¾	6	5	7	6¾	7¾	7
Silver Prize								
Succor								
Summit	75c	50c	80c	50c			1¼	80c
Scorpion	2.95	2¼	2.75	2¼	3	2.60	4.15	2.85
Solid Silver	20c	10c	20c	15c				
South Bodie	25c		15c	10c			25c	20c
South Standard								
Star	20c		15c		10c		10c	
St. Louis								
Syndicate	2¾	2¼	1¾	90c	1.40	1¾	1¾	1¼
Tioga Con	1.90	1.80	1¾	1¼	2.20	2.10	2¾	2¼
Tiptop	2	1.60	2	1¾	2	1.90	3	2
Trojan								
Union Con	45	39	44	29½	41¾	38¾	50	40¾
Utah	12	9¾	9¾	9	9	8	13¾	9¾
Vermont Con								
Ward	1.30	1	1.10	50c	1.05	1	1¾	1
Wells-Fargo							10c	
Woodville								
White Cloud								
Yellow Jacket	10¾	8¾	9¾	7¾	9¾	8¾	12¾	9¾

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 2.

		AFTERNOON SESSION.	
250 Andes	.50@45c	550 Addenda	.40c
30 Alpha	.40@35c	450 Allison	.40@35c
360 Alta	.3@2.95	245 Argenta	.1.55@1¼
185 Best & Belcher	.10¾@11	600 Belvidere	.1
340 Bullion	.3.80@3.85	60 Booker	.35c
2415 Belcher	.41@4.90	150 Boston	.1¼
1200 Benton	.1.70@1.65	35 Bulwer	.9¾
500 Caledonia	.1@1.85	75 Bodie	.8¾
50 Confidence	.7¼@7¾	65 Belle Isle	.1.40
430 Con Imperial	.45c	210 Becbtel	.1¼@1.60
65 Con Virginia	.4	670 Belmont	.95c@1
75 Chollar	.6	250 Caledonia (BH)	.2.90
740 California	.3.95@4	50 Pacific	.4¼
200 O Dorado	.95c	100 Concordia	.50c
360 Challenge	.1.60@1¾	200 Day	.35c
1320 Crown Point	.3¼@3.15	150 Dudley	.50c
100 Dardanelles	.80c	100 Endowment	.40c
600 Exchequer	.2.90@3	55 Eureka Con	.16¾@16½
450 Flowery	.30c	105 Grand Prize	.1.15
235 Gould & Curry	.5¼@5¾	50 Goodshaw	.15c
200 Golden Gate	.1.10	20 Independence	.1
170 Hale & Nor	.6¼@6¾	20 Jackson	.3¾
50 Julia	.1.95	150 Jupiter	.1.20
495 Justice	.2.90@2.95	100 Leeds	.50c
90 Kentuck	.3	220 Martin White	.50c
350 L Bryan	.20@15c	80 Mt Diablo	.13¾@12½
370 Leviathan	.30c	50 Mammoth	.1.70
250 Lady Wash	.50@55c	100 McClinton	.45c
165 Mexican	.17¼	270 Mono	.5¾@6
300 Mackey	.10c	225 Northern Belle	.5¼
375 N Bonanza	.55c	200 Navajo	.45c
1600 New York	.30@35c	390 Noonday	.4¾@4.80
180 Occidental	.1	10 N Noonday	.3
270 Oriental	.3¾@3¾	50 N Belle Is	.15c
290 Ophir	.19¾@19½	200 Oriental	.1¾@1.75
215 Potosi	.3	500 Paradise	.75c
230 Savage	.5¾	550 Queen Bee	.20@25c
500 Solid Silver	.10c	300 Real del Monte	.1¾
40 Seg Belcher	.15@17	150 Ray'd & Ely	.1
140 Silver Hill	.75c	130 S Bulwer	.55@60c
375 Scorpion	.3@2.85	500 S Bodie	.20@25c
570 Sierra Nevada	.18¾@18¾	100 Scorpion	.1¾
90 Utah	.9¾	40 Summit	.80c
230 Union Con	.41¾@40¾	75 Silver King	.7
50 Ward	.1	1155 Tiptop	.2@2.10
310 Yellow Jacket	.9¼@9¾	410 Wales	.3¼@3.15

Saturday A. M., Jan. 3.

400 Addenda	.40@35c
200 Allison	.35c
1050 Argenta	.1¼@1.55
395 Andes	.65c@1
995 Alta	.3.30@3.20
50 Alpha	.10¾@11
610 Belle Isle	.1.45@1¾
240 Benton	.2.10@2
135 Boston	.1.20
3580 Belcher	.5¾@6
100 Black Hawk	.50@45c
480 Best & Belcher	.12¾@13¼
435 Bullion	.5@4.95
100 Bulwer	.9¼@9¾
100 Booker	.40c
520 Belmont	.90@80c
1145 Bodie	.9
940 Con Virginia	.5@4.85
535 Chollar	.8@7¾
50 C Pacific	.4¾
930 Con Imperial	.60@65c
220 California	.4@4.10
280 Confidence	.7
1150 Crown Point	.4@4¼
150 Con Dorado	.1
2045 Challenge	.2.10@2
680 Caledonia	.1¼@1.70
1000 Champion	.20c
250 Dudley	.50c
150 Day	.70@65c
250 Dardanelles	.80c
300 Exchequer	.3¼@3.30
550 Endowment	.40c
350 Flowery	.30@25c
1720 Golden Gate	.1¼@1
595 Gould & Curry	.6¾@
50 Hillside	.1.40
50 Hamburg	.1¼
725 H & Norcross	.8¼@8¾
210 Independence	.1.65@1¾
300 Justice	.2¼@2.40
525 Jupiter	.1¼@1.20
855 Julia	.2.60@2¼
120 Kentuck	.4
400 Leviathan	.30c
185 Lady Bryan	.20c@15c
230 Lady Wash	.60c
1120 Mono	.7@6¾
200 Mammoth	.1¼
95 Mt Diablo	.13
170 Mackey	.10c@9¾
570 Mexican	.22@21¾
100 M White	.65c
1605 N Bonanza	.50c
1550 New York	.40c@35c
250 Navajo	.25c
100 Noonday	.4
100 N Belle Is	.20c
300 Northern Belle	.6¼
230 Occidental	.1@1.05
465 Ophir	.21¾@21¾
170 Overman	.8@8¾
420 Potosi	.4
200 Queen Bee	.25c
200 Summit	.85c
10 Syndicate	.1¼
410 Savage	.7¾
250 S Noonday	.1.65
10 Seg Belcher	.19
5 Silver King	.7
720 S Bulwer	.60@55c
1320 Sierra Nevada	.25@27
720 Scorpion	.3.05@3
1305 Silver Hill	.85c@1
200 Tioga	.2¼
200 Tiptop	.2.20@2.15
345 Utah	.13¼@13
875 Union Con	.47¾@50c
300 Wales	.3.20@3¼
50 Ward	.1¼@1.30
830 Yellow Jacket	.12@12¼

Monday A. M., Jan. 5.

765 Alta	.4@4¼
30 Alpha	.11¾
315 Andes	.90c@
1065 Bullion	.5@4.90
1085 Belcher	.5@6
755 Best & Belcher	.13¾@14
1550 Benton	.2¼@2.90
160 California	.4¼@4.40
1455 Con Imperial	.60@50c
575 Crown Point	.4@4.05
350 Caledonia	.1.55@1¾
1800 C Dorado	.1¼@1.10
410 Chollar	.7@7¼
1530 Challenge	.2@2.10
150 Dardanelles	.80c
440 Exchequer	.3¾@3.60
1550 Flowery	.30c
1100 Golden Gate	.1¼@2
610 Gould & Curry	.6¾@7
440 Hale & Nor	.9@8¾
410 Justice	.2¼@2.60
840 Julia	.2.60@2¼
70 Kentuck	.4
575 Lady Wash	.75@55c
200 Leviathan	.30c
500 Lady Bryan	.25@15c
660 Mexican	.21¾
300 Mackey	.10c
1140 N Bonanza	.75@80c
2000 New York	.40@50c
435 Ophir	.21¾@22¾
420 Overman	.8¼@8¾
270 Occidental	.1¼@1.15
275 Potosi	.4¼@4.15
1045 Scorpion	.3¼@4.15
595 Sierra Nevada	.25@24¾
735 Silver Hill	.80c@85c
360 Savage	.7¼@7¾
620 Union Con	.46¾@45¾
245 Utah	.12¼@12¾
50 Ward	.1.30
100 Wells-Fargo	.10c
905 Yellow Jacket	.11¼@11¾
AFTERNOON SESSION.	
400 Addenda	.40c
100 Albion	.40c
1710 Argenta	.1¼@1.30
935 Belle Isle	.1¼@1.55
600 Bodie	.9
400 Bechtel	.1.60
265 Bulwer	.9¼
220 Black Hawk	.60@50c
210 Belvidere	.80c
275 Booker	.45@50c
300 Boston	.1¼@1.30
200 Belmont	.70c
300 Caledonia (B H)	.2¼
350 Champion	.20c
1150 C Pacific	.4¼@4¾
200 Dudley	.50c
860 Day	.70@65c
500 Endowment	.40@35c
245 Eureka Con	.16¼@16¾
300 Elyan Dale	.25c
100 Giant & O A	.3
375 Grand Prize	.1¼@1.30
100 Golden Terra	.10¼
1350 Goodshaw	.30@35c
500 Hillside	.1¼
100 Independence	.1¼
100 Leeds	.50c
200 Leopard	.10c
590 Mammoth	.2¼@2¼
80 M White	.65c
165 Mono	.6¼@6¾
200 Mt Diablo	.13¾@14
2750 Navajo	.50@75c
600 N Belle Is	.50@40c
150 N Noonday	.3
445 Noonday	.4¼@4.80
100 Northern Belle	.6¾
100 Orient	.2¼@2¾
50 Oriental	.55c
20 Paradise	.85c
750 Queen Bee	.20@25c
1030 Raymond & E	.90@1
630 Real del Monte	.1¼@1.60
200 S Bodie	.20c
710 S Bulwer	.55@75c
100 S Nooaday	.1.85
160 Silver King	.7¼
100 Star	.10c
380 Summit	.1@1.05
160 Syndicate	.1¼@1¾
515 Tioga Con	.2¼@2.70
115 Tiptop	.2¼
540 Wales	.3¼@3.10

Tuesday A. M., Jan. 6.

35 Alpha	.10¾
475 Alta	.4@4.10
760 Andes	.75@65c
1440 Bullion	.4¾@4.70
220 Best & Belcher	.13¾@13¾
1175 Belcher	.5@6
1279 Benton	.2¼@2
245 Confidence	.7¼@7¾
380 Con Virginia	.4.55@4.60
190 Chollar	.7@7¾
60 California	.4.40
1150 Con Dorado	.1@1.40
1000 Con Imperial	.60@50c
1035 Crown Point	.3.60@3.40
225 Challenge	.2
400 Caledonia	.1¾
1000 Exchequer	.3¼@3.30
1065 Fairfax	.65c
2335 Flowery	.30@35c
610 Golden Gate	.2@2¼
320 Gould & Curry	.6¾@6¾
430 H & Norcross	.7¼@7¾
595 Julia	.2.20@2¼
150 Kentuck	.3¼@3.30
100 Leviathan	.30c
460 Lady Wash	.70@75c
2480 L Bryan	.20c
435 Mexican	.20¼@20
900 Mackey	.10@5c
875 N Bonanza	.75@65c
1065 New York	.40@50c
50 Occidental	.1.30
480 Silver Hill	.80@75c
360 Scorpion	.3¼@3.20
480 Silver Hill	.80@75c
630 Savage	.7¼
140 Utah	.11¾@11
550 Union Con	.44@43¾
40 Ward	.1.20
1015 Yellow Jacket	.10@10¼
AFTERNOON SESSION.	
1300 Argenta	.1¾
350 Albion	.35@30c
860 Addenda	.40c
400 Boston	.1¼@1.30
200 Black Hawk	.55c@
370 Booker	.45c
200 Bulwer	.9¼
625 Belle Isle	.1¾@1.45
120 Bodie	.9@8¾
640 Bechtel	.1.60
200 Belvidere	.95c@1
1000 Belmont	.70@80c
300 Champion	.15c
100 C Pacific	.6
225 Day	.65@70c
350 Dudley	.50@55c
2400 Endowment	.40@35c
100 Glynn Dale	.10c
50 Golden Terra	.11
920 Grand Prize	.1¼@1¾
400 Goodshaw	.35c
350 Hillside	.1¼
350 Jupiter	.1¼@1.20
595 Martin White	.65@75c
290 Mammoth	.2.90@3
170 Mono	.5¾
200 May Belle	.15c
300 McClinton	.40@35c
200 Manhattan	.1¾@1.30
115 Mt Diablo	.13¾@14
575 S Bulwer	.65c@60c
30 Silver King	.7¼
300 S Noonday	.1.85
850 Star	.10c
350 Syndicate	.1¼
570 Summit	.1¼@1.20
375 Tioga	.2¼
715 Tiptop	.2.65@2.80
320 Wales	.3@3.10

Wed'sday A. M., Jan. 7.

90 Alpha	.11¾
420 Alta	.4@4.05
1000 Andes	.75@85c
270 Bullion	.4@4.80
320 Best & Belcher	.14¼
140 Benton	.2.40
575 Belcher	.6@5¾
70 Confidence	.8¼
1455 Con Imperial	.60@55c
380 Crown Point	.3.90@3.85
630 C Dorado	.1¼@1.65
235 California	.4.30@4¼
375 Con Virginia	.4.55@4.60
1235 Challenge	.2
1000 Caledonia	.1.60@1.70
390 Chollar	.8@7¾
190 Exchequer	.3¼@3.70
1345 Flowery	.40@35c
980 Golden Gate	.2¼@2
295 Gould & Curry	.6¾
390 Hale & Nor	.8¾@8¾
575 Justice	.2¼
510 Julia	.2.40@2¼
415 L Bryan	.30c
200 Leviathan	.30c
250 Lady Wash	.70@65c
390 Mexican	.21¼@21¾
1000 Mackey	.10c
435 N Bonanza	.70@75c
550 New York	.40c
150 Occidental	.1.30@1¼
150 Ophir	.21¾
180 Overman	.8¼@8¾
400 Potosi	.4¼@4.10
20 Seg Belcher	.17
230 Savage	.7¼@8
200 Scorpion	.3@3¼
300 Silver Hill	.80@70c
235 Sierra Nevada	.20¼@21¾
40 Utah	.11¾@11¾
290 Union Con	.44¾@45¼
500 Wells-Fargo	.10c
150 Ward	.1.30
575 Yellow Jacket	.12@11¾
AFTERNOON SESSION.	
2070 Argenta	.1.45@1¾
400 Albion	.35c
1575 Addenda	.40@35c
1000 Belmont	.70@80c
650 Belle Isle	.1¾
90 Bulwer	.9¼@9¾
720 Belvidere	.1
2000 Bechtel	.1¼@1.65
200 Bodie	.9
350 Boston	.1¼@1.35
340 Black Hawk	.75c@1
100 Booker	.50c
70 Con Pacific	.5
500 Champion	.10c
150 Caledonia	.1.55
450 Dudley	.65c
20 Day	.70c
1100 Endowment	.40@35c
50 Eureka Con	.16¾
350 Julia	.2.60@2¼
740 Gold Prize	.1¼@1.65
1600 Goodshaw	.35@30c
230 Hillside	.1¼
420 Jupiter	.1¼@1.80
100 Leeds	.50c
600 Metallic	.70c
100 May Belle	.10c
145 Mono	.6
485 McClinton	.45@30c
280 M White	.65@75c
1320 Mammoth	.2¼@2¼
430 Northern Bello	.7¼@8
1075 Navajo	.35c
100 N Belle Is	.35c
50 N Noonday	.3¼
325 Noonday	.4.80@4
1100 Oriental	.75c@1
600 Orient	.25c
100 Paradise	.1
100 Queen Bee	.20c
100 Raymond & E	.90c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	2	20 Dec 10	Jan 14	Feb 3	T H Dixon	238 Montgomery st
Alpha Con M Co	Nevada	11	1 00 Nov 26	Dec 30	Jan 20	W H Willis	309 Montgomery st
Alta S M Co	Nevada	16	50 Dec 18	Jan 22	Feb 10	W H Watson	302 Montgomery st
Andes S M Co	Nevada	13	25 Dec 18	Jan 23	Feb 16	B Burris	Nevada Block
Bechtel Con M Co	California	4	25 Dec 22	Jan 30	Feb 9	W H Leut	Nevada Block
Belcher S M Co	Nevada	20	1 00 Nov 17	Dec 23	Jan 13	Jno Crockett	203 Bush st
Belvidere M Co	California	5	25 Dec 18	Jan 27	Feb 21	C V D Hubbard	203 Bush st
Best & Belcher M Co	Nevada	16	1 00 Nov 5	Dec 29	Jan 19	Wm Willis	309 Montgomery st
Booker Con G M Co	California	4	20 Dec 30	Feb 4	Feb 24	W H Leut	309 Montgomery s
Champion M Co	California	5	20 Dec 24	Jan 30	Feb 20	J Crockett	302 Bush st
Con. Imperial M Co	Nevada	10	20 Dec 10	Jan 14	Feb 4	W E Dean	203 Bush st
Curtis Con M Co	Nevada	2	05 Nov 21	Dec 24	Jan 12	H S Stone	419 California st
Crown Point G & S M Co	Nevada	39	1 00 Nov 17	Dec 22	Jan 12	Jas Newlands	203 Bush st
Douhle Standard M Co	California	2	15 Dec 10	Jan 14	Feh 4	W H Lent	309 Montgomery st
Dudley M Co	California	6	25 Nov 19	Dec 20	Jan 16	E C Masten	309 Montgomery st
El Tesoro	California	8	25 Dec 15	Jan 30	Feh 16	W H Chickering	214 Sansome st
Europa M Co	Nevada	8	10 Dec 30	Feb 3	Mar 6	J L Fields	240 Montgomery st
Goodshaw M Co	California	2	25 Nov 24	Jan 5	Feh 2	V Fernbach	307 Pine st
Gould & Curry S M Co	Nevada	37	1 00 Jan 6	Feb 11	Mar 4	A K Durbrow	309 Montgomery st
Grand Prize M Co	Nevada	3	75 Nov 25	Dec30	Jan 20	E M Hall	327 Pine st
Hillside M & M Co	Nevada	1	50 Nov 21	Dec 24	Jan 13	F Frankenthal	330 Pine st
Indian Queen M & M Co	Nevada	2	10 Nov 6	Dec 20	Jan 10	A K Durbrow	309 Montgomery st
Julia Con M Co	Nevada	10	1 00 Nov 19	Dec 24	Jan 16	H A Charles	419 California st
Justice M Co	Nevada	30	50 Nov 29	Jan 3	Jan 24	R E Kelly	419 California st
Lady Washington Con M Co	Nevada	1	20 Dec 22	Jan 26	Feh 14	W H Watson	302 Montgomery st
Mammoth M Co	California	3	1 00 Dec 5	Jan 15	Feb 13	A W Field	302 Montgomery st
Martin White M Co	Nevada	5	50 Dec 10	Jan 12	Feh 3	J J Scoville	309 Montgomery st
Mackey G & S M Co	Nevada	2	15 Jan 3	Feb 7	Feh 26	J M Buffington	308 California st
Mountain View S M Co	Nevada	1	25 Nov 31	Feh 10	Feh 28	J M Buffington	308 California st
McCracken Con M Co	Arizona	4	25 Nov 17	Dec 24	Jan 20	A Wenzelburger	216 Sansome st
North Bonanza M Co	Nevada	4	25 Nov 21	Jan 9	Jan 30	W W Stetson	309 Montgomery st
North Carson S M Co	Nevada	9	25 Dec 13	Jan 15	Feb 5	C Betts	113 Leidesdorff st
Original Gold Hill G & S M Co	Nevada	8	15 Dec 20	Jan 26	Feh 14	J M Buffington	309 California st
Overman S M Co	Nevada	44	2 00 Nov 25	Dec 31	Jan 21	Geo D Edwards	414 California st
Real del Monte M Co	Nevada	9	25 Dec 1	Jan 3	Jan 24	C V Hubbard	203 Bush st
Savage M Co	Nevada	40	1 10 Nov 9	Jan 2	Jan 22	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	6	25 Jan 6	Feb 10	Mar 2	G R Spinney	310 Pine st
Senator M Co	Nevada	1	10 Dec 22	Jan 24	Feb 21	L Reynolds	317 Mission st
Sierra Nevada S M Co	Nevada	61	3 00 Jan 6	Feh 11	Mar 3	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	9	50 Jan 2	Feb 5	Feb 26	W E Dean	203 Bush st
South Utah M Co	Nevada	4	10 Dec 22	Jan 24	Feb 13	W S Hinkle	207 Sansome st
Tioga Con M Co	California	8	20 Nov 26	Dec 31	Jan 21	W H Lent	309 Montgomery st
Trojan M Co	Nevada	12	25 Dec 23	Jan 26	Feh 16	D Wilder	328 Montgomery st
Utah S M Co	Nevada	28	2 00 Dec 18	Jan 21	Feh 9	G O Pratt	309 Montgomery st
Wells Fargo M Co	Nevada	13	10 Nov 17	Jan 12	Jan 30	A Colburn	10 Leidesdorff st
Ward G & S M Co	Nevada	5	40 Dec 10	Jan 16	Feb 5	Jacob Seadfeld	419 California st
Yellow Jacket S M Co	Nevada	35	1 00 Dec 19	Jan 23	Feb 23	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Ætna M Co	Arizona	1	05	Dec 23	Jan 29	Feb 18	J S Benear	420 Montgomery st
Atlanta M Co	Utah	1	05	Dec 23	Jan 29	Feb 18	A F McGrew	420 Montgomery st
Aurora M Co	California	1	10	Dec 3	Jan 3	Jan 18	P Conklin	28 Sansome st
Black Rock M Co	California	1	03	Dec 16	Jan 24	N T Root	227 Beale st
Cataract & Wide West H M Co	—	1	25	Nov 15	Dec 22	Jan 12	Wm S Lake	202½ Kearny st
Eagle C & S M Co	California	10	10	Dec 6	Jan 22	F W Utter	112 Leidesdorf st
Favorite G & S M Co	Nevada	1	01	Dec 6	Jan 7	Jan 23	Julius Peters	121 Sansome st
Gover M & M Co	California	40	10	Dec 24	Feh 2	Mar 1	W O Wilson	402 Front st
Hazard Grav M Co	California	4	03	Dec 2	Jan 5	Jan 25	J T McGeogbehan	318 Pine st
Headlight M Co	California	1	15	Dec 4	Jan 17	Feh 12	A W Feld	302 Montgomery st
Liberty Hill Con M & Water Co	—	1	60	Dec 30	Jan 16	—	J W Pew	310 Pine st
Mariposa Land and M Co	California	17	50	Dec 10	Jan 10	Feh 2	L Leavitt	309 Montgomery st
Mayhelle Con M Co	California	4	05	Dec 13	Jan 19	Feb 10	W J Taylor	310 Pine st
Monte Chisto Con G M Co	California	2	10	Dec 22	Jan 26	Feb 20	B Burris	Nevada Block
Morgan M Co	California	5	30	Nov 13	Dec 23	Jan 15	J J Raphael	533 Kearny st
Butte Creek Hydraulic M Co	California	4	15	Dec 31	Feb 5	Feh 25	R L Taylor	230 Montgomery st
N

Pacific Board—Latest Sales.

Wed'sday A. M., Jan. 7.			
50 Alpha	11¢	50 Scorpion	3¢@3.40
335 Alta	4¢@4.10	135 S Nevada	2¢@21
20 Andes	80c	20 Union Con	4¢@4¢
160 Bullion	5¢@4.85	40 Yellow Jacket	11¢@11¢
200 Best & Belcher	14	AFTERNOON SESSION.	
940 Belcher	6¢@5.70	10 Andes	75c
170 Benton	2.60¢@2¢	370 Alta	4.10@4.15
100 Colorado	2	45 Best & Belcher	13¢@13¢
850 Con Imperial	50¢@50c	140 Bentou	2.30¢@2
165 California	4.30¢@4	10 Belcher	5.60
65 Challenge	2	20 Bullion	4.65
300 Chollar	7¢@7¢	200 Con Imperial	55c
110 Con Virginia	4¢@4.05	55 Crown Point	3.65
380 Crown Point	3¢@3.90	40 Chollar	7¢
20 Confidence	8	50 Caledonia	1.65
130 Caledonia	1¢@1.60	50 Eureka Con	17¢
160 Exchequer	3.70¢@3.55	10 Gould & Curry	6
300 Flowery	37¢	30 Hale & Nor	8¢@8¢
145 Gould & Curry	6¢	40 Julia	2.35
310 Hale & Nor	8¢@8¢	55 Justice	2¢@2.40
105 Justice	2¢@2¢	30 Mexican	19¢
60 Julia	2¢	20 New York	40c
200 Mexican	21¢@21¢	50 Overman	8
30 Mammoth	2.90	30 Potosi	3.90
100 New York	40c	40 Sierra Nevada	20¢@20¢
90 Ophir	21¢	20 Savage	61
80 Overman	8¢@8¢	235 Silver Hill	75¢@75c
170 Potosi	4¢@4.10	190 Summit	1.30
50 Silver Hill	75c	20 Utah	11¢@11¢
110 Savage	7¢@7	40 Yellow Jacket	11¢@11¢

California Board—Latest Sales.

Wed'sday A. M., Jan. 7.			
20 Alta	4¢	700 W Comstock	15c
535 Belcher	5¢@6¢	50 Yellow Jacket	11¢@11¢
40 Best & Belcher	14¢@14¢	AFTERNOON SESSION.	
60 Bullion	4¢@4.85	110 Andes	75c
150 Benton	2.55	40 Alta	4.15@4.10
750 Black Hawk	85¢@90c	500 Atlas	12¢@11c
30 California	4¢	150 Arcouta	1¢
70 Con Virginia	4¢@4.60	20 Bentou	2.40
200 Con Imperial	60c	90 Belcher	5¢@5¢
270 Crown Point	3¢@3.85	40 Best & Belcher	13
30 Chollar	7¢	50 Bullion	4¢
50 Dardanelles	80c	820 Black Hawk	90@95c
80 Exchequer	3¢@3.45	40 Chollar	7¢
30 Gould & Curry	6¢@6¢	30 Challenge	2
35 Hale & Nor	8¢@8	70 Con Virginia	4¢
120 Julia	2.40	75 Crown Point	3¢
110 L Bryan	35c	250 Con Imperial	55c
40 Mexican	20¢@20	350 Central	10c
100 Mint	5c	200 Enterprise	1¢
150 New York	40c	100 Enkowmen	40c
500 N Sierra Nevada	3¢@4c	85 Gould & Curry	6¢@5¢
30 Ophir	21¢@21¢	20 Hale & Nor	8
120 Overman	8	40 Justice	2.55
30 Potosi	4¢	30 Mexican	19¢@19¢
100 Scorpion	3.30	100 Mexican	19c
200 Scorpion	3.30	200 Orient	20¢@21¢
100 Silver Hill	82c	150 Potosi	4
50 Savage	7¢@6¢	50 Queen Bee	25c
30 Sierra Nevada	21¢@21¢	130 S Bodie	20c
200 Trojan	4c	20 Union Con	43¢@43¢
20 Utah	11¢@11¢	15 Wales	3.20
30 Union	44¢@44¢	30 Yellow Jacket	11¢

Mining Share Market.

In the latter part of last week prices were well sustained, and hopes were entertained by dealers that a buoyant market was opening for them. But in the early part of the present week there was a falling off in values with a marked depression which has not since been wiped out. The fluctuations have not been worthy of note. During this time and at the last session of the Boards there was a very limited demand and the sales were meager.

At the mines there has not been any occurrence worthy of particular notice except that connection was made at noon on the 4th inst. between the north header of the Sutro tunnel and the east crosscut of the Gould & Curry and Best & Belcher 1200 level. The top of the header and the bottom of the crosscut come together.

The extreme cold wave having passed away, it is prohable the hullion shipments will he heavier in the next few weeks.

Assemhlyman Gorley introduced a hill in the Assemhly on the 4th which bears stringently on the wash sales and fictitious operations in the stock hoards, making all such transactions a felony. Also against hrokers hypothecating stocks held by them, helonging to their customers, and to cause them to hold, inviolate, the identical shares left in thcir hands by them. This is a hlow at false sales.

Bullion Shipments.

Since our last issue, we have noticed the following hullion shipments :

Mastadon mill, Dec. 26th, $600 ; Belmont Co., one week, $7,075.51 ; Eureka Co., Jan. 4th, one week, 203,575 pounds; Richmond Con., Jan. 4th, one week, $29,410.56; Agua Fria smelting works, Jan. 6th, 20,000 pounds hase bullion; Silver King, Jan. 8th, 12,000 pounds concentrations; California, Jan. 3d, $105,483.39; Union Con., Jan. 5th, $43,435.21 ; Con. Virginia, Jan 3d, $27,386.57; Northern Belle, Jan. 3d, $9,278.48; Christy, Jan. 5th, $10,231; Alexander, Dec. 29th, $1,802.49 ; Alexander, Dec. 31st, $2,261.81; Alexander, Jan. 2d, $5,788.35; Bodie Con., Jan. 6th, $13,255 ; Ophir, Jan 3d, $27,684.21 ; Northern Belle, Dec. 27th, $11,667,51 ; Northern Belle, Dec. 29th, $6,014.38 ; Northern Belle, Dec. 31st, $8,114.69.

MR. WM. BRUCKNER, well known as an inventor and metallurgist, has received quite a compliment from a foreign source. At a Permanent Exhihition of an Italian society for the promotion of mechanical industries, which is held in Naples, Mr. Bruckner's roasting furnace and ore pulverizer has been on exhihition. The society has awarded him the "Gold Medal for Industrial Merit." These machines are heing made hy an agent of Mr. Bruckner in Milan ; they are also heiug manufactured at Lisle, France.

IT is officially announced that the French vintage is 30,000,000 hectolitres under the average of the last ten years.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

COLD WEATHER.—*Ledger*, Jan. 3: The present cold snap has closed down all the uhining companies at Oleta.

NEW QUARTZ MILL.—The new mill, in Big canyon, of Max Oriffith & Co., will be ready to run inside of the next week.

REPAIRING DITCH.—As soon as the weather changes, so that the works can be run hy the water of Indian creek and the South Fork ditch, the water will be shut off from the big ditch for the purpose of repairing the ditch from the mine to the Middle Fork of the Cosumnes, so as to be ready to commence floating wood and timber down to the mine by Feh. 1st.

QUARTZ CLAIM.—Evans & Co. are prospecting a quartz claim on the north side of Dry creek, one mile above Drytown. The shaft is now down 20 ft, with a ledge two ft thick, which prospects from $12 to $15 per ton.

CONEY MINE.—Retimbering of the Coney mine has been completed to a depth of 450 ft, and two drifts have been started. An additional hoilor will he put up at the mill soon.

NEWTON MINE.—The Newton copper mino is now being worked with renewed vigor, and a number of extra men were put to work a few days ago.

BUTTE.

MINING ITEMS.—*Mercury*, Jan. 2: Now that the rains have made water abundant, we hear of mining being carried on extensively all over the mineral portion of the county. The Spring Valley, at Cherokee, a company that does not depend on the rainstorms for its supply of water, is doing its usual amount of work and presenting to the public the usual number of golden bricks each month. The Hendricks mine, in Morris ravine, will soon be at work in a new place, with most flattering prospects, taking the prospects that are made of the dirt as a criterion. The Big Bar, under the management of John C. Speucer, is proving to be a mine of great value; worth all the money and time spent to put it in its present running condition.

A GOOD PROSPECT.—San Juan *Independent*, Jan. 3: Wm. Ferguson, of Ferguson & Robinson's mine, Butte county, procured from eight pans of dirt about $3 worth of gold, coarse and fine; some of the pieces would weigh over 25 cents. The paus of dirt were taken off the bedrock on ground that had been ground-sluiced. Mr. Ferguson informs us that years ago, when he first worked the ground, he obtained pieces that would weigh over an ounce, and he is hunting for the "pocket" where they came from. We hope it will not be long before he shall discover it.

CALAVERAS.

MINING NOTES.—*Chronicle*, Jan. 3: Work is now progressing in all the gravel mines in this vicinity. The Safe Deposit, Rough Diamond, Green Mountain, Durgan, Boullion, Mammoth, Bonanza, Eureka and Maison de Sante are all running full-handed and pushing things at that. The long-continued cold weather has decreased the water supply somewhat, but it is steadily approaching a maximum again, and the probabilities are decidedly against any further failure from cold this season. The outlook is now decidedly favorable for the mining interest in this portiou of the county. A large quantity of snow has fallen in the mountains and the unusually cold weather we have had recently has frozen it so solidly that it won't thaw out until late next summer. That is a circumstances that presages an abundant water supply until late in the season, and will measurably extend the time that can profitably be devoted to active mining operations. So far as the yield of the gravel mines is concerned reports are extremely favorable.

KERN.

ENTERPRISE GRAVEL MINE.—*Californian*, Jan. 1: Work will be commenced on the Enterprise mine, an extensive gravel claim in the canyon of Kern river, next Monday. Several hundred feet of hydraulic pipe is in position.

MONO.

MINES AT BENTON.—*Bentonian:* That the series of mines of which the Wild Rose is at present the center of attraction are likely to produce a bonanza is not at all improbable. The Wild Rose is down 51 ft and 8 ft in the drift, with no indications of the hanging wall. This is indicative of a wide ledge. The ore is free milling all the way down, and about 75 tons now lie on the dump. A tunnel has been started at the foot of the hill which will tap the ledge at a depth of about 260 ft. Work has been commeneed ou the Nina Rose hy Almon & Smith, and so far as progress has been made the ground shows well. Preparations are being made by Col. Farrington and Capt. Nickelson to at once commence work on the Emma Nickelson, which was the original discovery of the series. On the other claims there has not yet been enough work done to be worthy of mention. A town site, with lots 100 ft square, has been laid off, several houses have been erected, while others are under way, fences have been put up, and taken altogether the place begins to assume the dignity of a camp.

WALNUT.—Bodie *News*, Jan. 1: The Walnut mine has been organized by a company with a capital of $1,000,000. Developments thus far are exceedingly encouraging. Shaft down about 70 ft. Ore sufficient to pay all expenses has been taken out. Ore on the dump averages $64 per ton.

NEW MINES.—Prof. Phillips is putting down shafts in two new mines, near the ledge of the Travcler company's locatiou, for parties in New York.

SOPHIA.—Another New York company has been organized to work the Sophia and other claims. Capital, $50,000, with liherty to increase to $250,000.

MOUNTAIN KING.—The Mountain King shaft is now in over 70 ft. Developments satisfactory. An assay office has beeu estahlished at Richmond, and another at Hot Springs. The sinking of a shaft has been commenced five and half miles from Hot Springs, in a gold and silver claim, by a party from Brooklyn, N. Y. Many strangers are arriving and prospecting over the field. Surveyors are running lines of claims and placing corner posts.

SMELTING WORKS.—The Montgomery County Smelting Company has about finished its works. Blish & Co. are erecting smelting and other works near the Walnut mine. Several permanent buildings are going up at the mines. The climate is very mild, the frost seldom affecting the earth over an inch deep. As yet, very little machinery is in operation. Only two mines have any.

DOUBLE STANDARD.—The east crosscut from the bottom of the winze is now in 66 ft; progress made since last report, 12 ft. There is no change to note in the character of the formation passed through. The north drift from the east crosscut, 200 level, has been run during the week 23 ft, with no change worthy of note in the ledge.

BULWER.—The west crosscut from the south drift, 380 level, has been advanced since last report 10 ft, making a total length of 200 ft. The rock in this crosscut is all very hard. The west crosscut from the bottom of the Ralston winze is in 101 ft; progress made during the week, 11 ft.

SUMMIT.—The shaft has been sunk during the past week 11 ft, making a total depth of 521 ft. The ledge in the bottom is three ft wide, and is looking well. The west crosscut from the south drift, 300 level, is now in 100 ft, with no change to note in the character of the formation.

KING BEE.—Ground was broken yesterday on the new double-compartment shaft of the King Bee mine on Queen Bee hill. The shaft-house is completed, and a contract has been let to sink the shaft 100 ft.

ORIGINAL SUMMIT.—Work on this mine in sinking the shaft is making good progress. The shaft is now 54 ft deep, and the ledge continues of high-grade ore that assays from $75 to $400 per ton.

H. L. & M. C. JOINT TUNNEL.—Mammoth City *Herald*, Dec. 24: The late inclement weather has had no effect on the workings, which have been steadily pushed forward. They have now passed entirely through the conglomerate formation in which they have been working, and are now in solid rock. They are making, on an average, about nine ft per day.

NEVADA.

MT. AUBURN MINE.—*Transcript*: The new hoisting works of the Mt. Auburn quartz mine in this district are completed. It was the intention of Superintendent Kirby to have started the machinery some days ago, but owing to the freezing of the water in the ditch, he was unable to do so.

GODFREY.—Grass Valley *Union*, Dec. 31: The new gravel and cement mill of the Godfrey Gravel mining company will be ready to commence dropping its stamps in a few days.

ROSE HILL LEDGE.—A clean-up of five loads of quartz has just been made from the Rose Hill ledge, which runs through the grounds of the old Marshall place, on Winchester hill, which is now the property of R. D. Lowry. The result was $96.05 per load. The quartz was taken out at a depth of about 30 ft. The ledge, so far, is small, it being about eight inches. Other rock has been takeu out which looks equally as well. There is no water in the shaft to interfere with working and good progress can be made. The lead is being opened by a company of working miners on the tribute plan.

SARGENT & JACOBS' CLAIM.—*Transcript*, Jan. 4: In spite of the extremely cold weather the new hoisting works at Sargent & Jacobs' claim, Quaker hill, has been obliged to stop only once or twice for an hour or so on account of the water that runs the hurdy freezing. The shaft is down 156 ft, and will reach the top of the tunnel in 32 ft more. The hard cement through which it passes requires blasting, and about two feet is sunk per day.

JULIA.—The Julia gold quartz mine, on Deer creek, above the Merrifield and opposite the Providence, will soon be sufficiently developed to demonstrate its true value. After sinking the incline to a depth of 00 ft, and taking out eight or ten tons of fine looking rock, Messrs. Sloan & Dunn, the owners, began to run a tunnel, which has progressed 45 ft, and will tap the ledge within 20 more. Some large holders have been met in pushing the stopel thus far, making the work a little slow. There is a good millsite near the mouth of the tunnel, and plenty of free water can be obtained to run the machinery. The owners express themselves as more than satisfied with their prospects for having a good claim.

MERRIMAC.—*Herald*, Jan. 3: This mine is located on the quarter section just east of the Round Mountain mine. The owners have been prospecting the ground to, ascertain the locality of the ancient river channel. They first sank a shaft down 80 ft and found a strata of gravel on the bedrock, but it contained little or no gold. A tunnel was then run from the bottom of the shaft a distance of 600 ft. Their efforts were rewarded by finding the channel and good pay gravel. The strata reached is from five to six feet thick and prospects richly. The success of this enterprise is of great importance to that promising mining district, as it shows the direction and location of the channel through the mountain. The location of the find is about 500 ft from the line of the Round Mountain claim, and between that claim and the Adalante, thus proving the direction in which the channel strikes the Adalante claim, besides demonstrating that it actually exists there. The deepest portion of the channel has in all probability not been reached yet, as, where the Round Mountain company is at present drifting, the pay gravel is from 12 to 10 ft and deep. The Round Mountain district promises to become lively when the Merrimac and Adalante companies get their mines open and commence drifting.

FLUME ACCIDENT.—*Transcript:* Two sections of the V flume at Snowy Point, above the Red Dog road, broke down Monday afternoon under the weight of ice and snow in the boxes. The damage will be repaired as soon as practicablo.

PLACER.

HIDDEN TREASURE.—*Forum*, Jan. 1: The Hidden Treasure gravel mine, at Sunny South, Placer county, has yielded over $98,000 during the past year, $37,000 of which has been divided into dividends. This is one of the many instances of good paying mines in this part of the State.

MINING INTERESTS.—Our mining interests are assuming greater activity as the season advances, the abundant rains having furnished an ample supply of water for washing. The Polar Star and Southern Cross are both in active operation, employing between 30 and 40 men each and working two shifts. The Franklin claim at present is idle, but the company lutend soon to start a new tunnel at a lower level from Bear river, as the pay dirt is largely below the old tunnel, which is nearly useless unless for working the top dirt. The Lckamp mine is working a small force and so far report a very successful run. A. Larson has several men at work in the Shady Oleu mine extending the tunnel and sinking with good prospects. The Central company are operating in new ground in a different portion of their claim from last season. The ground, it is said, prospects very fair. Other claims operated by individual owners are prosperous, and considering that it is yet early in the season, our hydraulic mines have a very fair start.

STOPPAGE OF WORK.—Owing to the severe cold weather of last week the mines were shut off from their supply of water for washiug. This was a precautionary measure taken to prevent the water from freezing in the ditches if the cold weather continued, which would require work to cut it out or a modifying of the weather to thaw out.

TULARE.

EMPIRE MINE.—The Tulare *Times* says: Hon. Thomas Fowler's Empire mine is all that was expected. The mill is in good working order and bullion is being turned out in good paying quantity.

TUOLUMNE.

HAZEL DELL.—*Independent*, Jan. 3: The Hazel Dell quartz mine, owned by ex-U. S. Assessor Gideon Wing and other parties, is situated in the Enterprise mining district, about eight miles in an easterly direction from Columbia. This property is already attracting the attention of capitalists. The developments alrcady made upon this mine are of so encouraging a nature that active work upon the mine will soon be started.

COLUMBIA.—The mining prospects in and around Columbia, continue most favorable. It is rumored that an important strike has been made in the Shanghai mine, on Yaukee hill, owned by George Morgan, Esq., of the City hotel. A great deal of bullion was taken from this mine in the early days. The Pat Smith, Birney & Hudson claim, on Yankee hill, is developing some remarkably fine prospects.

GEM MILL.—The Gem mill started up a few days ago. Everything is working satisfactorily. The re-opening up of the mine has been the means of discovering new hodies of valuable ore.

ITEM.—Hans Christiansen, the owner of a hydraulic mine, near the county line of Tuolumne and Calaveras counties, was in town on Monday with a pocket full of specimens, one of which was almost pure gold, and worth at least $100. Several other pieces varied in value from $2 50 to $25. It made a good many persons think that the "good old days of Columbia" had come again once more.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Supt's Letter, Jan. 5: We are extracting the usual amount of good-milling ore from our 2400 stopes, which look well, and making preparations to commence the extraction of ore from our 2300 stopes. The Brunswick and Morgau mills are engaged in reducing the ore.

OPHIR.—Supt's Letter, Jan. 5: On our 2500 level the main east drift is in 35 ft from the incline. We shall, during the week, commence excavating for the ore and waste chutes of this level. We shall reach our southern boundary and pass into California ground, from which point that company will run the drift to a connection with the C. & C. shaft. On Monday last we cut into vein porphyry carrying some low-grade ore and the face now shows the same material. We are extracting the usual quantity of good-milling ore from the stopes.

MEXICAN.—Supt's Letter, Jan. 3: We have now 35 ft more to sink before reaching our 2300 level, at which point connection will be made with the drift being run south from the Union shaft by the Union Con. company, and the drift being run north from the Ophir incline by the Ophir company and ourselves.

CON. VIRGINIA.—Supt's Letter, Jan. 3: Since date of last report we have hoisted 1,170 tons of ore. We are making preparations to resume work on the 850 level. On our 1550 level we still continue to extract ore lying to the east of the old stopes. On the 1750 level the work of repairing No. 1 winze is completed, and we have commenced to extract ore at that point.

CALIFORNIA.—Supt's Letter, Jan. 5: During the past week we have extracted 1,225 tons of ore. On the 1750 level we are still engaged in stoping out ore from the north ore body. The raise from crossent No. 8 is now up 114 ft on the slope. This raise will be connected with the 1050 level some time during the coming week. This will form a direct connection with the Con. Virginia shaft and materially improve the ventilation of this portion of the mine.

SILVER HILL.—Supt's Letter, Jan. 5: We have ordered a Baker blower, which will he here about the 10th of next month. The Ophir compauy have a uow one, not in use, which they will let us have immediately and take ours when it comes. This accommodation will give us a good supply of fresh air in a few days.

HALE & NORCROSS.—Supt's Letter, Jan. 8: The air connection from 2100 to 2200 levels, through north winze, has been made, and the ventilation much improved. Our pumps are working splendidly, making over 10,000 strokes per day.

OVERMAN.—A crosscut has been started from a point in the 1000 north drift 180 ft from the Belcher. This is about 20 ft south of the south line of Segregated Belcher.

BELMONT DISTRICT.

BRIGHTER.—Times are considerably brighter in Belmont than they have been for a long time past. The Belmont company are running 10 stamps, and made their first bullion shipment last week. The company are daily putting new men into their mine, and it is understood that 10 more stamps are to be started soon.

ALEXANDER.—Belmont *Courier*, Jan. 4: This mine is ono of the best in eastern Nevada. There is au immense amount of good milling ore in sight, enough to keep three or four 20-stamp mills running for years. The new crusher will be started up some time in January, and if it proves a success the bullion output of the Alexander will he quadrupled.

EUREKA DISTRICT.

PROGRESS IN THE K K.—Eureka *Sentinel*, Jan. 3: During 1879, about $80,000 was spent in developing the K K. The main shaft was sunk 200 ft, two new levels were opened, and considerable prospecting done on another. Oro has been found on the eighth level within the past week, and it is said that ore hodies are now uncovered in all the levels in the mine. For the current week, about $7,000 worth of ore bas been shipped to the Richmond, and more will shortly follow. The last assessment was sufficient to pay all debts, including one which has been hanging over the company for some time, and should another be levied, the money will he used in developing the mine. At no period in its existence has the K K looked hetter.

CONNOLLY.—Mr. M. P. Murphy has leased the lower levels of the Connolly mine from Mr. John A. Potter, the Superintendent, and will immediately proceed to develop it.

SILVERADO DISTRICT.

THE QUEEN.—Eureka *Sentinel*, Jan. 4: Tho Queen mine is ono of the best little mines in the State. Its ores are of high grade, and the owners have always worked the mine at a fair profit. Just now four men are engaged who extract about $100 per day. The ore ranges from $150 to $800 per ton. It is usually treated at the Richmond.

ARIZONA.

BRADSHAW ITEMS.—*Arizonian*, Dec. 26: The Tiger mine has been sold to a New York party. The Oro Bonito has been sold to a San Francisco party, who has taken charge of it. The Goodwin is a splendid ledge. The Del Pasco mill is ready to run. The Bowen saw-mill is running; quartz mill not yet started. Frank Ryland has again started his arastras to grinding rock from the Southern Belle. It paid him $50 per ton before water gave out last summer.

MINING ITEMS.—Cave Canyon district, in the Huachucas, sends in the most favorable reports of the richness of its mines, which average from $150 to $800 per ton. E. N. Fish and others, of Tucson, contemplate reopening the old Mowry mines, seven miles south of Patagonia. Washington camp, near the Sonora line, is developing a fine lot of carbonate smelting ores of average value of $50 per ton, with ledges ranging in width from 1 to 150 ft. Another rich mining section is being attended to in Pinal county, Mineral Hill, 14 miles from Florence.

TOMBSTONE ITEMS.—*Citizen*, Dec. 27: The Grand Central mine, at a depth of 175 ft, has some very rich ore, some beautiful samples of which are in town. Assays run very high. The Contention people are still taking out their chlorides and getting ready for operatious at the new mill. The Rattlesnake, south of the Grand Central, has a shaft down 70 ft on a very strong ledge, and are now in solid ore. They have the footwall, but, as yet, have not found the hanging wall. The oro is of the samo general character as the Contention and Grand Central. Mr. A. J. Mitchell and others are owners, and the property is now bonded for $75,000. The Emerald, near the Rattlesnake, was recently purchased by Messrs. Marks and Goldtree. The owners intend to sink a shaft at once and properly develop the mine. The same parties have begun work on the Blue Jacket, which shows a fine ledge of ore averaging about $125 per ton. They also own an interest in the Way Up mine, on which they will sink a 50-ft shaft. Work is progressing on the Head Center mine with good results. The new owners have started up again on the Empire mine, and have a fine body of ore. The Corbin mill will be ready for ore soon after Jan. 1st, and the Contention expects to start up about a month later. The Corbin mill will work custom ore.

COPPER LEADS.—*Nugget*, Dec. 25: A new feature is springing up in the Huachuca mountains, in the copper leads which abound in that range. Marks & Co., who own some claims in what is known as the Miller and Mormon canyon, have been offered and given a bond for $80,000. The ore gives an assay of 40% copper and from $230 to $250 per ton in silver. The near approach of the railroad is opening a market for the valuable copper leads in the Huachuca mountains.

PATAGONIA ITEMS.—Tucson *Star*, Dec. 25: Ore has been struck in Protection tunnel at a distance of 270 ft. This is supposed to be the south veiu of the Hermosa. Another contract has been let. The W. C. Davis mine has been sold to San Francisco parties for $45,000. The Hardshell still continues to uncover fine hodies of ore D. Gillette has put a force of men to work on the mill site, grading and opening up the water courses. Some very rich discoveries have been made on the north side of Mowery hill, these fine claims showing good ore. A new town has sprung up at the old Patagonia mine, and it is christened Mowery. There is an assay office run by Bragg. Washington camp is coming to the front. The camp is located three miles south of Mowery. Mr. Allen is putting up a good hotel.

HERMOSA.—Pima *Record*, Dec. 25: In the south tunnel of the Hermosa exceedingly rich ore has been struck, about 300 ft in, of same quality as that in the main shaft. There has been some talk about the Hermosa having "petered." If these doubters would visit the mine now, and examine recent developments, they would be more than satisfied of the great value of this property. The deepest shaft is about 75 ft. A piece of ore from this

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On the Origin of the Leadville Ore Deposits.

All through the Leadville ore district limestone is universally recognized to be the bedrock of carbonate formation, and limestone being, therefore, the strata underlying our subject—its foundation, as it were—it is with that I begin.

This limestone was deposited at a time when atmospheric and terrestrial conditions were totally dissimilar to those of the present day. The formation of the minute crystals of calcite and dolomite that unite in building up limestone does not in general take place through the simple secretion of the carbonates of lime and magnesia from the bicarbonates of these earths that are held in solution in sea water, because none of the conditions are given under which their secretion from the solution could take place. Where springs occur that deposit lime, it is on account of the evaporation of water and volatilization of the carbonic acid that the carbonate of lime is secreted. Seventy-five per cent of the water of our present seas would have to evaporate, however, before a deposit of limestone could be formed, a process only to be thought of as possible in the case of an inland sea or at the mouths of large rivers. These latter spread their waters, containing the bicarbonate of lime and magnesia, on the surface of the ocean, whose waters are specifically heavier in consequence of the percentage of salts, and are here exposed on the one hand to the influence of the sun's heat, on the other to that of hurrowing winds, whereby an evaporation of part of the water as well as of carbonic acid is facilitated, and the formation of carbonate of lime is made possible.

A similar process took place, on a far greater scale, however, in the oceans of the oldest geologic periods. At that time, the atmospheric precipitations were richer in carbonic acid than at present, as they had to traverse an atmosphere in which was diffused the whole of the carbonic acid which has since been incorporated with the earth, in the carbonate rocks, as such, in the plants, and in the carboniferous formations. These rainfalls, rich in carbonic acid, acted on the lime and magnesia silicates of the then existing rocks, decomposing them and conducting strongly concentrated solutions of lime and magnesia carbonates to the sea. The final degree of concentration was reached on the surface of the ocean, and the carbonates of limes and magnesia were deposited in the form of dolomitic limestone.

On top of this limestone was deposited locally, and in varying thickness, carbonate of iron. The formation of carbonate of iron is not possible where air can get at it; therefore, it must have taken place at a time when this valley was covered by the sea. If air were present, so rapid is the change from the protoxide of iron to the hydrate, that hydrated carbonate of iron would have been formed.

Now, after all this lime and iron had been deposited, there ensued a period of volcanic activity. Huge masses of porphyry were poured out of the craters, covering the iron and newly-formed limestones with immense masses of rock, the eruption being partly submarine in character. During this outflow of porphyritic lava, a general upheaval of the country took place, and the sea that covered it, receding, poured its flood eastward. After the first eruption, the land again subsided for a sufficient length of time to allow of another deposit of iron and lime being formed, whereupon once more porphyry was ejected in immense quantities, covering the beds of limestone and iron with fresh masses of eruptive rock. This change took place several times, forming thus the different contacts between lime and porphyry that have been met with in this district.

The gradual dying out of volcanic action was accompanied by the usual disturbances. Earthquakes occurred, rending the rock into huge fissures, from which exuded thermal springs, holding different minerals in solution, and, as was probably the case, these fissures were opened again and again. Fissures do not assume their present dimensions from the beginning, but were originally narrow clefts which were partially widened; indeed, fissures that were already formed and filled with vein-material were subject to frequently-repeated openings, which can be easily explained if the slow and gradual action of the upheaval is taken into account. If the fissures were already cemented together by gangue rock, and a new tearing-open of the vein took place, it was refilled, and in that way widened.

Now, the fissures would naturally be formed where the least resistance would be encountered, which, in this case, would be along the planes of contact between porphyry and lime. It is very probable, however, that the fissures did not always adhere strictly to the contact planes between porphyry and lime; indeed, the evidence goes to prove that, in certain places, the volcanic agency, not content with forming fissures along the planes of contact between porphyry and lime, made huge rents in the solid rock itself. Subterranean waters, seeking an outlet to the earth's surface, took advantage of these fissures, and appeared under the guise of hot springs.

The rare and very slight percentage of alkalies contained in most ore-veins is noticeable, and as a distinguishing feature, stands in marked contrast with the eruptive rock, whereas the country rock, where it contained alkalies, has, for the most part, lost them in the neighborhood of the vein. They have been dissolved and carried off in the form of solutions, while other substances have been deposited in their place. In other words, the dissolving of the alkalies has reacted on and furthered the precipitation of the vein minerals; and it is therefore not to be wondered at, if veins have frequently been found to be richer when passing through decomposed rock.

Principally water, in conjunction, perhaps, with different gases, was the medium which collected the diffused particles of the metals and other substances, and deposited them by gradual processes in a far more concentrated form than before. It is known that, in the majority of veins, the gangue material has either come from the neighboring rocks or from deeper regions below.

We have now, therefore, these thermal waters circulating along the fissures, which are filled with carbonate of iron. These waters contain, besides oxygen, lead, silver and other minerals in solution. All substances, therefore, which unite with oxygen become oxidized when brought in contact with such waters. Thus, the oxygen, attacking the carbonate of iron, frees the carbonic acid and, with the help of water, changes it to hematite; the lead, containing most of the silver, is deposited in the form of galena or sulphuret of lead. It is a well-known fact that all metallic sulphurets are subject to a gradual process of oxidation in the presence of water containing oxygen, such as we have supposed to be circulating along this fissure; therefore, most of the galena would naturally be oxidized to lead-vitriol or anglesite. Metallic carbonates are frequently formed by the decomposition of the metallic sulphates, through the action of water containing carbonates of alkalies or alkaline earths (said sulphates resulting from the oxidation of the metallic sulphurets). In this case, the carbonic acid of the iron, freed by the oxygen of the circulating waters, attacks in its turn the sulphate of lead, changing it to cerusite, unites with the alkalies held in solution in the water, and deposits of lime are formed, a certain quantity of the acid escaping in gas form. The sulphuric acid, derived from the decomposition of the metallic sulphates, connects also with the alkalies of the water and is carried off in solution.

The chemical processes involved in these changes can be clearly shown in the following formulæ:

$$Pb.S + O_4 = PbO.So_3.$$
$$PbO.SO_3 + CO_2 = PbO.CO_2 + SO_3.$$

The lead ores galena and cerusite, carrying the greater part of the silver, form the body of the vein, but are also generally finely disseminated throughout the iron ore. The occurrence of chlorides and bromides of silver in some localities attests the superincumbent presence of the sea during the formation of the vein minerals.

Thus we have our veins, which were originally deposits, filled with hematites that contain some of the silver, lead ores that contain the rest, and spring water charged with carbonic acid. The volcanic activity decreased gradually and finally died out, leaving a few feeble soda springs in the surrounding country to attest its former greatness.

Ages passed, and erosion began its work. The land was carved out, by the agency of wind and water, to its present form; then followed the glacial period, covering the greater part of the country with varying thicknesses of boulder drift, rounding all the foothills, and leaving incontestable evidence of its existence in the terraces so frequently met with lower down, in the valley of the Arkansas. Finally, the mountains, hills, and valleys were hidden from view by a dense growth of spruce and pine forests, an impenetrable veil not to be lifted, until man, in his eager search for gold, disclosed the more modest, perhaps, but certainly more valuable and lasting deposits of silver, upon which were founded the future prosperity and greatness of the city of Leadville.—*F. M. Amelung, in Engineering and Mining Journal.*

Clean-up.—From a letter written by J. C. Franck, of French Gulch, to John Louden, of Reading, we learn that John and Ignatz Franck have cleaned up again, and that out of 31 tons of rock they got $1,850. This is a fitting reward for the enterprising owners, and we congratulate them upon their success. French Gulch is very rich in quartz, and with the assistance of the hardy sons of toil residing there, will add materially to the wealth of Shasta county.—*Reading Independent.*

Since January, 1878, the Argenta Company has shipped bullion valued at $85,798.52. This shipment is the result of less than two months' milling. A dividend of $20,000 has been paid during the year, and no assessments have been levied upon the stock. About the 1st of next month the company will take charge of the Grand Prize 20-stamp mill, and will probably run it on ore from the mine during the winter.—*Tuscarora Times.*

The Furguson mine is keeping up its lick. The result of six and a half days' run, crushing 60 tons, brought to town Wednesday, was $1,400. Yield for month thus far, $3,331, which will be materially added to by the close of the month.—*Sonora Democrat*, Dec. 27th.

From all information, it is safely assumed that the annual consumption in the United States of precious metals in all form for manufacturing purposes, now averages $7,000,000 of gold and $5,000,000 of silver.

New Mines in Inyo.

Situated in a detached spur of mountains just to the northward of Deep Spring valley, and but a few miles distant from Piper's ranch in Fish Lake valley, are two ledges of gold and silver-bearing quartz. The ledges are about a mile or less apart, and run in a northeast and southwest direction, parallel to each other and also to the axis of the mountain. These are the locations in question. The most westerly, which has an elevation of some 500 feet greater than the other, is designated as the Great Mogul. It crops out boldly from four to ten feet wide, for full one-quarter of a mile in length. Specimens from various portions of croppings from end to end are so nearly alike in general appearance as to be quite undistinguishable as being from different parts of the lode. This uniformity in general appearance is quite as well sustained in assay values. It appears that it is hardly possible to find a piece of rock larger than a man's fist but makes a goodly and quite uniform display of both chlorides and sulphurets of silver, the former rather predominating. Following are the figures of two assays made recently: No. 1—Gold, $14; silver, $103.67; total, $117.67. No. 2—Gold, $14.50; silver, $95.50; total, $109.50. The other lode is still more of a wonder in various ways. Its average width is about six feet, perhaps more as an average, since it widens to 25 or 30 feet. There are no less than five different locations, each of 1,500 feet, all marked in continuous length by the plainly visible croppings. In this distance it is cut down and exposed at one point by a narrow gulch to a depth of from 1,200 to 1,500 feet below the highest points of the same croppings on the adjacent mountain side. Throughout this great distance the uniformity in appearance and assay value of the ore is nearly as well sustained as in the first mentioned. This lode, as a whole, is known as the Great Eastern, and the several claims respectively as the Great Western, the Horton, the Whiteman, the Thanksgiving and the Eastern. There is a stream of running water about a quarter of a mile distant from one point of this lode and plenty of wood about three miles distant. Assays made at the same time as the above resulted as follows: One from the Horton—gold, $12.55; silver, $51.83; total, $64.38. One from the Thanksgiving—gold, $50; silver, $337.33; total, $387.73.—*Inyo Independent.*

Prevention of Overwinding.

Mr. R. Cottex, of Virginia City, gives to the *Enterprise* the following description of the working of a device he has patented for the prevention of overwinding of cables of hoisting works:

This device is to shut off the steam at a proper depth in the shaft, by the action of the cage as it ascends, and to set the brake when the cage rises two or three feet above the landing. The steam valve and brake are operated on by means of trips and weights. The steam may be shut off at any depth required in the shaft, by placing the trip for that purpose at the desired depth. I think it should be placed so low in the shaft that when hoisting about half a load, or a small load of men, the cage, when running at ordinary speed, will just come above the landing; then, if the brake is good and the gallows frame is of ordinary hight, there is but little danger of running into the sheaves. In hoisting full loads, after the speed has slacked, if the cage does not come above the landing, the engineer can turn on the steam again to bring up the load, as he does not at any time lose control of the steam valve, and he need not set the weight until after landing the cage. The engineer should always shut the steam off before the cage strikes the trip in the shaft; then, in case he is away from the steam valve, or negligent in his duty, it will shut the steam off for him. The portion of this device for shutting off the steam operates every time that the cage passes the trip in the shaft when it is ascending, and the engineer cannot hoist the second time without setting the weight or knowing that it is not set, for when he turns on the steam to hoist again if it is not set, the weight will be banging on the valve or lever. It takes but a second or two to set the weight, and the engineer can set it at any time after landing his cage before starting up again. The trip for setting the brake should be placed high enough on the gallows frame to give the engineer sufficient room for landing his cage without touching it. As it is only intended to be used when the cage goes too high, it does not interfere with working other brakes, and a competent engineer may run for several months without bringing it into action. When he does it is very easily set again. It can be built very powerful, and if the brake is good will hold more than the engine can hoist. My patent makes no claim to the brake or steam valve. It is intended to be applied to those now in use with as little expense as possible, but the better they are the better it will operate. In connection with this statement, I wish to say in reply to some objections I have heard to these devices: First, it is said by some that they have a tendency to make the engineer careless, and I have no doubt but some of them have; but in regard to this device, I can say on the authority of some of the engineers who have used it for about eighteen months, that it is inclined to make the engineer careful instead of careless, for if he does not shut off the steam at the proper place, it will not only shut it off for him, but it will also give his arm such a jerk that he will recollect it for some time. One of them remarked to me not long ago that it was "the darndest quickest thing to wake a man up he ever saw; if he was drowsy or sleepy it would give him such a jerk that it would bring him to his senses in no time." Secondly, I have heard it said they can turn on a full head of steam and let the engine go when coming up loaded, but they cannot when coming up empty. To this I can say that they can by shutting the steam off low enough in the shaft, but is best not to shut it off so low, for an engineer is not likely to turn on a full head of steam when coming up without a load and let his engine go; and, again, if the steam is shut off too low, the engineer, when hoisting loads, must turn it on again and hold the valve open with the weight hanging on it until he brings his load to the top. The steam should be shut off low enough in the shaft to prevent running into the sheaves when running at ordinary speed, with or without a load.

I make this statement for the benefit of all interested, and hope it will be copied by the papers of mining towns in general.

Reworking an Old Mine.

The Placer *Argus* has the following to say concerning work going on near Bloomer cut: J. S. Morris, G. C. Price and J. M. Brooks, having obtained control of the old Decker mine, below Bloomer cut, part of it by purchase and part by lease, began working the same Sept. 3d in good style. Fifteen men are employed there at present, working in three shifts of eight hours each, which arrangement is found better than the working of two ten-hour shifts would be. The place has assumed every appearance of a lively little camp. The mine has lain idle for about 15 years, with the exception of $100 worth of assessment done yearly to maintain title. The old shaft, which was down 65 feet, has been cleaned out by means of a Hammond water lifter and one of Gregory's patent steam pumps. Thirty tons of rock have recently been sent to Pugh's mill to be crushed, and satisfactory results are confidently anticipated. The shaft is covered by a substantial building, the dimensions of which are 28x30 feet A boarding-house and blacksmith shop have been erected; a stable is being put up, and the building of another dwelling-house will be begun next week. The claim is 1,500 feet in length, and 100 feet on each side of the ledge. They have also taken up the eastern extension of 1,500 feet more, and are sinking a second shaft thereon. An old car, which had been covered up in the shaft for 18 years, was excavated the other day, and that, together with the timbers, was found to be in a first-rate state of preservation.

The Engineer.

Report of the State Engineer.

A writer for the *Call* has secured some hints in advance concerning a forthcoming report, which we give for what they may be worth: State Engineer Wm. H. Hall is at work upon his report to the Legislature upon "providing a system of irrigation, promoting rapid drainage and improving the navigation of the Sacramento and San Joaquin rivers." The report will be submitted this week, and will be a very elaborate document, containing exhaustive arguments on the problems of irrigating plains, the condition and capacity of the drainage lines of the State, the improvement of the navigation of rivers, the relation which hydraulic mining bears to the navigation of rivers, the amount and value of agricultural land injured, and suggesting a plan whereby such injuries may be averted, with deductions and recommendations in regard to the principles which ought to govern in the irrigation of lands, and the relief of the rivers when in flood. In reference to irrigation, Mr. Hall endeavors to solve the following problems: The position and acreage of lands in the valleys of the State which are now, or may in the future be, in need of irrigation, and divide them into natural districts; to ascertain the water sources from which each district may be most conveniently irrigated; the quantity and length of time of the supply, with details of the best means for irrigating each district; how the irrigation of land has been accomplished, and at what cost; the processes of irrigation and their results, showing the progress made in developing agriculture and affecting property values, tax returns, and the capacity of the land to support population—pointing out the comparative values of irrigation and dry farming in different portions of the State. Under the head of "Conditions and capacity of the drainage lines of the State," Mr. Hall gives the extent and location of lands subject to overflow by the San Joaquin and Sacramento rivers and their tributaries; the characteristics with regard to topographical configuration and subsoil of the swamps; the nature of the floods, and whence and how they come; the method of draining and reclaiming them, with suggested improvements, and their cost, pointing out the climatic changes resulting from reclamation of swamps, and its effect on navigation; showing the present outlook and drawbacks, and pointing out what should be the true policy of the State and General Government toward the whole subject-matter. In relation to improvement of the navigation of rivers, Mr. Hall says: "The importance and great value of internal commerce by means of free and roomy highways therefor, upon the internal water-courses of a

country, is too generally recognized for this subject to give rise to any questions which may properly be designated as problems, other than those of a purely engineering nature—those respecting the methods of improving the channels themselves, or preventing the navigation of them from being injured; there being no question as to the opinion that it were good policy so to do." In considering the preceding questions, Mr. Hall discusses what he calls "political problems", or "questioue" which are presented in the consideration of ways and means to adopt in systematizing the distribution of the waters of the streems of the State, so that the greatest good may accrue to the greatest number, from the benefits to be derived from irrigation, are properly political problems.

There are legal points, financial and business considerations, and social questions involved in this class of "problems." An exhaustive history is given of the past and present navigation and condition of the streams, and the causes to which present conditions are attributed; works of the past, designed for improving navigation, and their effect; the danger from material injury in the future, and what preventive measures should be employed to counteract or arrest the evil. The "effects of hydraulic mining" are dwelt upon at length, and the proportion of debris transported by the rivers from hydraulic mines is given; also, its effect upon the stream in its carrying capacity and the elevation of flood waters; the injuries to agricultural land by the product of washings being deposited thereon; the proportion of debris carried by rivers from quartz and placer mines, and other sources, with proposed remedial measures, and concluding with a statement of the relative importance of mining and agricultural interests, and how the latter is threatened with serious injury by debris deposits.

According to the terms of the act, which was approved March 29, 1879, "The Governor is authorized to employ, for the purpose of advising and assisting the State Engineer, two consulting engineers, who shall receive $3,000 a year each." Col. Mendell and Gen. Alexander, of the U. S. Engineer Corps, were appointed consulting engineers by Gov. Irwin. Gen. Alexander died, however, and Capt. Eads, who was engineer of the Mississippi River bridge, etc., was appointed to the vacancy, but is now in Europe, and will not return in time to be consulted prior to submitting the report. An appropriation of $100,000 was made to defray the expenses of the operation. The State Engineer gets $6,000 a year. The act under which he was appointed is closely allied to that creating the Sacramento River Drainage District, and establishing a Board of Commissioners therefor. Col. I. W. Smith was appointed Chief Engineer of the latter, and reported against the feasibility and effectiveness of building the proposed canal from Knight's Landing to Suisun bay, whereby it was hoped the Sacramento might be reduced during flood seasons. For this work an appropriation of $10,000 was made.

Railway Construction in 1879.

The *Railway Age* has an article reviewing the progress of railway construction during the last year. It says that the past year has been an extraordinary one in respect to the revival of railway building, more miles of track having been laid than in any year since 1873, and probably more than in that year. We quote as follows: The returns, of course, are not yet all in, but from various sources of information we have compiled the following table showing the total mileage constructed in each State, so far as we are able to learn, reserving the opportunity to a detailed statement with additions:

	Broad gauge.	Narrow gauge.	Total.
Arizona	153	—	153
Arkansas	—	9	9
Colorado	7	00	07
Dakota	220	—	220
Georgia	10	25	35
Illinois	90	—	90
Indiana	74	40½	114½
Iowa	325	40	371
Idaho	—	00	00
Kansas	498	—	498
Kentucky	05	—	65
Louisiana	65	—	65
Maine	—	18	18
Maryland	18	—	18
Massachusetts	11	—	11
Michigan	12	41½	53½
Minnesota	394	—	394
Missouri	101	27	188
Nebraska	125	—	125
Nevada	—	35	35
New Jersey	4	—	4
New Mexico	125	—	125
North Carolina	25	—	25
New York	67½	6	73½
New Hampshire	—	0½	0½
Ohio	105	108½	213½
Oregon	30	—	30
Pennsylvania	14	5	10
South Carolina	—	2	2
Tennessee	119	57	176
Texas	120	67½	187½
Utah	83	46	129
Virginia	20½	—	20½
West Virginia	—	20	20
Wisconsin	00	15	75
Total	3,010	728½	3,738½

It will be noted that the greatest amount of tracklaying has been done in Kansas, which shows nearly 500 miles of new roads, while Minnesota follows with 394, Iowa with 371, young Dakota with 220 and old Ohio with 213½, and so on.

It is also notable that nearly one-quarter of the total mileage—at least 728 miles—is of narrow gauge, showing that the narrow-gange "delusion," as some call it, has not yet run its course.

Useful Information.

How the Ancients Engraved Gems.

A writer in *Harper's Magazine* for September says: We must remain as yet some little in doubt as to the methods employed by the old artists to perfect these miracles of taste. We have, however, the absolute certainty that these ancient masters were familiar with the diamond, and that their best work was made by using this, the hardest of all substances, as a tool. A splinterad fragment of the diamond served as a scraping tool, and they were well acquainted with the drill. Prehistoric men worked a drill at the very commencement of his existence. A Phœnician gem—a lion attacking a bull—shows how the drill was used. A number of circular depressions are found in the gem which mark the extremities of the figures. This was done not for the sake of effect, but to show the artist the limit of his work as to depth. After the holes were sunk, the artist united the various portions of his work by scratching. Now the use of the diamond point or spluter, fixed in a style of iron socket, allowed a certain flexibility of handling which our modern processes of gem-engraving do not permit.

To-day the work is done by means of a minute rotating disc of copper, which is whetted with oil and diamond dust. On the least application of the substances to be cut to the disc, it is the disc which bites into the stone. The difference of manipulation is, then, that to-day it is the stone which goes to the tool, and not, as in olden times, the tool to the stone. It is more convenient, then, in 1879, to bring the cart to the horse. It can now be readily understood why, in modern work, time and labor being spared (the art-conception not entering for the present into the subject), why this work of to-day is inferior to the art which is past. It is purely a mechanical process now, for a rotating disc will no more draw lines which have feeling than will photographing processes paint pictures. It has been stated that we are not entirely acquainted with the methods employed by the old glyptic artists. This becomes quite evident from this fact, that their best work seems to have been both cut and polished at one and the same time. To-day we have no tool, no substance which will accomplish this double feat. Mr. King, dwelling on the diamond point, says: "Its extensive use is the great distinction between the antique and modern work."

"Jannin's Cement," a recently patented French product, named after its inventor, is simply composed of a mixture in suitable proportions of yellow oxide of lead—that known in trade as "Massicot" is preferred—and glycerine; other metallic oxides and coloring matter may be added to the above mixtures, according to the character or color that may be desired. The cement may be made to possess more or less stiffness by varying the proportions of glycerine—the larger the percentage of the latter, the softer the cement, and *vice versa*. This cement is represented to be especially adapted for molding objects which demand an extreme delicacy in the lines of the cast, such as engraved blocks and plates, forms of printing type, photoglyptic plates, etc. It is affirmed that it sets in a few minutes under the influence of a gentle heat and then admirably resists heat and pressure. When set, it is said to make a good substitute for lithographic stone. It is also recommended for artistic reproductions, such as fac similes of terra cotta, the color and sonorousness of which it closely imitates. It does not shrink in setting. So says the *English Mechanic*.

Vegetable Dyes from Cabbage.—MM. Savigny and Colineau have just made a discovery of considerable practical importance in obtaining harmless colors from this vegetable. They have succeeded in extracting from red cabbage, or broccoli, a coloring matter which is absolutely inoffensive, and capable of application in all the ordinary operations of painting, printing and dyeing. To this they have given the name *cauline*, from the Latin *caulis*, a cabbage. The leaves of the plant are cut into small pieces, thrown into boiling water in the proportion of 3 lbs. of the leaf to 3 liters of water, and there left to macerate for 24 hours; at the end of this time they are withdrawn and subjected to a strong pressure, and the juices thus expressed are added to the liquor of infusion. As thus obtained, the "cauline" is of a blue-violet color, and forms the base of a series of derivatives of various colors.

Repeating Matches.—A patent has been taken out for a repeating match—that is, a match that may be struck a great many times, and yield a light each time. The match consists of two rods of inflammable composition, placed side by side in two compartments, with a suitable case. In order to strike the light, a scraper is moved by hand along a platform across the open ends of the two rods. The scraper removes a certain quantity of its enhstance from each rod, and mixing these together, the light is produced. One stick is composed of three parts chlorate of potash and one part of clay, thoroughly mixed and formed into a thick paste by the addition of water, then dried. The other stick is made of three parts amorphous phosphorus and one part of clay, prepared in the same manner.

Household Perils.

Under this head the Boston *Journal of Chemistry* names several dangerous substances which find their way into households. There are two or three volatile liquids used in families which are particularly dangerous, and must be employed, if at all, with special care. Benzine, ether and strong ammonia constitute this class of agents. The two first named liquids are employed in cleansing gloves and other wearing apparel, and in removing oil stains from carpets, curtains, etc. The liquids are highly volatile, and flash into vapor so soon as the cork of the vial containing them is removed. Their vapors are very combustible, and will inflame at long distance from ignited candles or gas flames, and consequently they should never be used in the evening when the house is lighted. Explosions of a very dangerous nature will occur if the vapor of these liquids is permitted to escape into the room in considerable quantity. In view of the great hazard of handling these liquids, cautious housekeepers will not allow them to be brought into their dwellings, and this course is commendable.

As regards ammonia, or water of ammonia, it is a very powerful agent, especially the stronger kinds sold by druggists. An accident in its use has recently come under our notice, in which a young lady lost her life from taking a few drops through mistake. Breathing the gas under certain circumstances causes serious harm to the lungs and membranes of the mouth and nose. It is an agent much used at the present time for cleansing purposes, and it is unobjectionable if proper care is used in its employment. The vials holding it should be kept apart from others containing medicines, etc., and rubber stoppers to the vials should be used.

Oxalic acid is considerably employed in families for cleaning brass and copper utensils. This substance is highly poisonous, and must be kept and used with great caution. In crystalline structure it closely resembles sulphate of magnesia or epsom salts, and therefore frequent mistakes are made and lives lost. Every agent which goes into families among inexperienced persons should be kept in a safe place and labeled properly and used with care.

Weight of Different Minerals.—The following shows the weight (avoirdupois) per cubic foot of various kinds of material: Average mortar, 106 pounds; loose earth, 95 pounds; common soil (compact), 124 pounds; clay (compact), about 135 pounds; clay with stones, 160 pounds; brick, 125 pounds; lead, 709 pounds; wrought iron, 481 pounds; cast iron, 450 pounds; lime, 64 pounds; sand (loose), 96 pounds. And the following shows the bulk of one ton of different substances in cubic feet: earth (compact), 18; earth (loose), 32 cubic feet.

To Destroy Bugs and Fleas.—This mixture, which has been patented in France, consists of 80 parts of bisulphide of carbon and 20 parts of essence of petroleum.

Good Health.

The Sanitary Virtues of the Eucalyptus and the Pine.

At a recent meeting of the Social Science Congress, at Manchester, England, Mr. C. T. Kingzett read an interesting paper on the subject of the above title before the health section of that body. He referred to the old theory that the admitted sanitary powers of the "fever-tree" were due to its drainage properties, and held that this hypothesis lacked evidence, and even at its best was of a negative character. He argued that the superiority of the eucalyptus as a means of drainage would be measured by the proportion in which its rate of growth exceeds that of other trees, and affirmed that this was quite inadequate to account for its extraordinary fever-destroying properties. Other trees planted in malarial districts do not free them from the disease, from which, the author infers, the action of the eucalyptus is of a positive type.

The conclusion to which he comes is that the eucalyptus, and also the pine, exert a beneficial influence in virtue of the volatile emanations arising from them. He finds that the *Eucalyptus amygdalina* yields from 3 to 6 pounds of oil from 100 pounds of its leaves; and that this oil is practically identical in composition with the oil of turpentine derived from pine trees, and with most of the so-called essential oils or perfumes. These oils, when submitted to the action of atmospheric oxygen and moisture, produce peroxide of hydrogen and a number of camphoraceous substances having decided antiseptic properties.

He makes a calculation to show the enormous amount of these emanations. Taking, for example, New South Wales and South Australia, he shows that the eucalyptus forests of these districts contain, at any given moment, sufficient oil in their leaves (ready to be given off into the atmosphere by the agency of warm winds) to form by contact with the atmosphere over 92,000,000 tons of peroxide of hydrogen, and over 507,000,000 tons of camphoraceous principles. From the exalted oxidizing power of peroxide of hydrogen, which greatly exceeds that of ordinary oxygen, and the readiness with which substances of animal and vegetable origin are oxidized, and from the well-known antiseptic properties of the camphoraceous substances above named, Mr. Kingzett concludes that the sanitary virtues of the eucalyptus must, without doubt, be ascribed to the active chemical operation of its emenations. What is true of the eucalyptus must also be true of the pine, and on an immensely larger scale, since pine forests are widely distributed over both hemispheres, and the oil of turpentine, which is a natural product of the pine, undergoes the same chemical changes in the atmosphere as the oil of eucalyptus.

Why Gold in Jewelry Changes Color.—It is well known that the human body contains humore and acids, similar in action to, and having a like tendency towards baser metals, as nitric and sulphuric acid have, namely, to tarnish or dissolve them, varying in quantity to differ at persons. Thousands wear continually, without any ill effect, the cheaper class of jewelry with brass ear wires, while if others wore the same article for a few days they would be troubled with sore ears, or, in other words, the acids contained in the system would so act on the brass as to produce ill results. Instances have occurred in which articles of jewelry of any grade below 18 carat have been tarnished in a few days, merely from the above-named cause. True, these instances are not very frequent; nevertheless it is as well to know them; every case is not the fault of the goods not wearing well, as it is generally called, but the result of the particular constitution by which they are worn.

Zymotic Contagion.—Prof. Tyndall asserts that diseases are propagated not by effluvia or sewer gas, but by solid particles discharged into the atmosphere by currents of air or gas. This he proved by the following experiment: He cut up a piece of steak, steeped in water, heated it at a little above the temperature of the blood, then strained off the liquid; in a short time this fluid became turbid, and when examined through a microscope was found to be swarming with living organisms; by the application of heat these were killed, and when the solution was filtered he obtained a perfectly pure liquid, which, if kept free from particles of dust, would remain pure for an unlimited period; but if a fly were to dip its leg in fluid containing living organisms and then into the pure liquid, the whole would be swarming with animalcula in 48 hours.

The Use of Nitrite of Amyl.—A few drops of nitrite of amyl have a powerful influence in restoring the functions of the heart in cases of drowning, hanging or fainting. It is suggested, therefore, that it should always be used whenever attempts are being made to restore to life an individual apparently dead, or when it is desirable to settle the question whether a person is really dead or not. Dr. Brunton says that in ascertaining death the nitrite of amyl might be used only with the test of tying a cord round the finger. If the circulation has entirely stopped, the part beyond the cord never becomes any thicker, but if the circulation continues, however slowly, the finger-tip beyond the ligature will sooner or later begin to swell.

Extracting Fragments of Metal from the Flesh.—A simple and usually successful mode of extracting a needle, or any piece of steel or iron broken off in the flesh, is accomplished by the application of a simple pocket magnet. Iron filings have a way of imbedding themselves in the eye which defies almost every ordinary means for their extraction. For their removal, a small, blunt, pointed bar of steel, well magnetized, will be found excellent, and we should recommend that workmen liable to such injuries keep such an instrument about them. It would be a good plan to insert such a bar in a penknife, in a manner similar to a blade.

Borax and Nitrate of Potash for Hoarseness.—These two salts have been employed with advantage in cases of hoarseness and aphonia occurring suddenly from the action of cold. The remedy is recommended to singers and orators whose voices suddenly become lost, but which by these means can be recovered almost instantly. A little piece of borax, the size of a pea, is to be dissolved in the mouth ten minutes before singing or speaking; the remedy provokes an abundant secretion of saliva, which moistens the mouth and throat. The local action of the horax should be aided by an equal dose of nitrate of potassium, taken in warm solution before going to bed.—*La France Medicale.*

Solvent for Salicylic Acid.—The difficult solubility of salicylic acid prevents its ready use in medicine. Kohlmann recommends acetate of ammonia as a solvent for it, and the following as the simplest plan for preparing a 20% solution for medicinal purposes: Cover 10 parts of salicylic acid with 24 parts of ammonia, shake frequently until it is dissolved, and then add 16 parts of dilute acetic acid, or just enough to produce a slightly acid reaction. The solution has a saline taste, which, however, is not at all disagreeable.

A New Surgical Conquest.—Surgery can justly boast of a new conquest; when an eye is severely wounded, the healthy one is in danger of being impaired by "sympathy;" to preserve the good eye, it was hitherto the practice to remove the injured one. Dr. Boucheron has discovered, that by cutting the ciliary nerves, the "sympathy" is stopped, and thus dispenses with the necessity of removing the injured organ. Forty surgeons have thus operated successfully,

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Assessment Notice—Atlanta M. Co.

The Week.

The convening of the Legislature this week at the State capital is an important event for California, and the members seem to have begun work in good earnest, with somewhat less of the usual bickering over positions than is usual. A bill has already been introduced with regard to reformation of certain abuses in mining stock matters, elsewhere referred to. The retiring Governor, in his message, makes the sensible suggestion that the questions between the farmers and miners, with relation to mining debris, will be better settled by discussion in the legislative halls than in the courts. In this connection we note that Congress has at last waked up, and two bills have been introduced of importance to the State. One is for the appointment of a U. S. Mining Commission of competent engineers to investigate the debris question; the other is to appropriate $500,000 towards improving the water-ways in rivers affected by the debris. All these things tend towards an early and amicable settlement of the whole dispute.

From all the mining districts we hear of hopeful anticipations, with strenuous efforts to effect their realizations. New work is being inaugurated in the leading districts, and the outlook is favorable for the approaching season.

Edison has apparently given proofs of the utility of the system of lighting by electricity, and it will be only a question of time as to when the electric light will be the illuminator in general use.

Anxiety is experienced in Europe by the warlike attitude which Russia is assuming, both in the concentration of her forces and by the extensive orders she is giving for arms and ammunition.

The influx of gold still continues into the Atlantic centers of finance from Europe, and its tendency is to greatly increase speculation and the promotion of the leading industries of the nation.

There appears among our own people to be a better state of feeling, combined with an increasing confidence, which must lead to better times.

A New Fine Ore Furnace.

Mr. H. H. Eames has put into operation at his works in Saucelito, Marin county, recently an improved furnace for smelting fine ores, such as flue dust from lead furnaces, iron sands, etc., for which he has received a United States patent, procured through the MINING AND SCIENTIFIC PRESS Patent Agency. The primary object of the invention is to feed fine ores or flue dust to the body of the furnace in such a manner as to prevent its passing up the chimney in the blast, as happens usually, more or less, in this class of furnaces. This is accomplished by turning a blast of air, previously heated by the waste heat of the furnace, into the stream of ores flowing down the feed pipe, said hot air impinging on the ore as it falls, and blowing it into the already molten mass on the hearth of the furnace. The ore is thereby prevented from clogging in the pipe, and from being carried up the chimney by the blast. A peculiar valve regulates the feed to a nicety.

The furnace devised by Mr. Eames is intended to consume crude petroleum as fuel, but any class of fuel may be used.

In the fire-bridge, between the fire-box and hearth, is a pipe or tube, and a slot is made along the lower edge of this fire-wall level with the hearth of the furnace, the slope of the hearth continuing up into said slot, so that the ore which comes into the pipe or tube on the fire-bridge is directed downward into the mass of molten metal and slag on the hearth. A tube connects with the tube or pipe in the fire-bridge and leads up to the ore hopper on top. The pipe furnishing the blast of hot air enters the tube in the bridge wall through which the ore is introduced, entering said tube just below or on line with the ore-feed pipe.

Then as the ore is fed in through the hopper and falls down the feed pipe, just as it reaches the ore-tube the blast of heated air takes it and forces it out through a slot in the fire-bridge into the mass of molten slag in the body of the furnace.

In starting up the furnace a certain amount of metal is put in through a door in the side of the furnace, and melted, so as to form a bath of metal, as it were. Then the fine ore coming in by the feed pipe is blown into the bath before it has an opportunity of being carried up the flue. The outlets for the hearth are the same as in any ordinary furnace.

One serious defect in the ordinary furnaces for treating iron sands, fine dust, etc., has been that a great proportion of the fine ore has been carried off by the blast. This difficulty Mr. Eames obviates by the method described. The fine ore does not clog in feeding, as the blast keeps it moving. The ore is heated by the blast, to a certain extent, before entering the furnace, while no heat is lost in heating the air for the blast, as it collects only waste heat, from the position of the air pipe in the furnace. This heat is again returned to the mass of the ore, being carried back by the air in the pipe.

The Debris Question in Congress.

Representative Berry has introduced a bill for the preservation and improvement of rivers and harbors in California, of which the following is the full text:

WHEREAS, The navigation of the Feather and Sacramento rivers in California is already seriously injured, and must soon be destroyed by the vast quantities of earth washed into mountain streams and their tributaries by mining operations, especially by what is known as the hydraulic process, and by precipitations of such washings by winter freshets into said rivers; and

WHEREAS, The shoaling of the waters of San Pablo and San Francisco bays and deposits around Mare Island show the rapidity with which the harbors therein are being filled and the permanent ruin that must follow; and

WHEREAS, It is the duty of the General Government to protect from injury and improve the navigable waters in the interest of commerce; and

WHEREAS, The deposits of earth aforesaid not only affect the rivers, bays and harbors of California, but have already submerged and destroyed over 100,000 acres of valuable agricultural lands, and are now jeopardizing many hundreds of thousands more, and have changed the course of the Yuba river, upon which the city of Marysville is situated, so raised the bed above the level of the streets, and have so raised the bed of the Sacramento river, upon the banks of which Sacramento city, the capital of the State, is located, as to threaten the very existence of these cities; and

WHEREAS, The State of California, in order to avert further destruction to property and to avert possible collision between the mining population and the inhabitants of the cities and valleys, has created a State Engineering Department to examine the subject and report some plan of averting further damage by deposits of mining debris in the streams of the State, by which the agricultural and mining interests can both be greatly conciliated, and cities and harbors saved from destruction; and

WHEREAS, It is for the interest of commerce that the General Government should aid in accomplishing the results sought by the State; therefore,

Be it enacted, etc., That the sum of $500,000 be and is hereby appropriated, to be expended under the direction of the War Department, in preserving the navigable streams of the State of California from injury by deposits of debris from mining operations.

The bill was referred to the Committee on Commerce.

The Solar Eclipse.

The Path of Totality—Future Total Solar Eclipses.

The annual meeting of the Academy of Sciences was held last Monday evening in the Academy building, southwest corner of California and Dupont streets. The President, Prof. George Davidson, being absent in Monterey county, locating the observatory for noting the total solar eclipse of the 11th inst., Vice-President Moore occupied the chair. Charles G. Yale, the Secretary, read the following paper on the eclipse, prepared by Prof. Davidson:

Total Solar Eclipse, January 11, 1880.

The path of the penumbra of the total eclipse of January 11, 1880, passes from west to east over the Pacific ocean, its northernmost limit being at Behring strait and its southern in the South Pacific, in latitude 27° south.

The central line of the total phase passes across the Pacific from latitude 10° north, longitude 207° west of Greenwich, through latitude 5° north and 177° west; thence northeasterly until it strikes the California coast in latitude 36° 4′, longitude 121° 35′, at 3.55·37 P. M.

When it reaches this position the sun will be only about 11 degrees of a quarter above the horizon; thence the path of the central line of totality passes across the Continent at points located as follows:

Latitude.	Longitude.	Latitude.	Longitude.
36° 09′	121° 23′	38° 03′	117° 42′
36 29	120 46	38 33	116 41
36 50	120 06	39 11	115 21
37 12	119 22	39 50	113 50
37 36	118 35	41 43	100 47

And at the last place it leaves the earth at sunset.

If the above co-ordinates are plotted on a map, it will be seen that the path of the central eclipse passes over the Salinas valley about 14 miles southeast of Soledad; over the Southern Pacific railroad near Fresno; directly over Millerton; over Eberhart, in the White Pine district; three miles south of Salt Lake City; and strikes the Central Pacific railroad at Aspen and at Bryan, near which place it leaves the earth at sunset. All the stations of the Central Pacific railroad from Webber to Bryan will be in or remarkably close to the path of totality; but of course the sun will then be in the horizon.

The width of the path of totality will be little over 30 miles, and the duration of totality about 35 seconds.

The time of totality where it crosses the Southern Pacific railroad will be nearly 40 seconds later than when it strikes the coast, and the sun will be about 10 degrees high; and under ordinary circumstances of atmospheric disturbance from irregular refraction the limbs of the sun and of the moon will not be sharp and steady. It is most likely that both bodies will exhibit "spurious disks," and the limbs of both be blurred and confused. Under such circumstances the phenomenon of "Baily's Beads" will be exhibited just as the last line of the sun's edge disappears behind the moon. This bright line will then be broken into a wavy line of bright spots. The phenomenon will recur upon the re-appearance of the sun's bright limb. Should the atmosphere be remarkably steady, then this phenomenon will not be present, but the fine line of the sun's disappearing edge will be continuous and *disappear as a line;* it will *also re-appear as a line* at the third contact.

The report of the eclipse of 1869, as observed in Alaska, fully established the last named condition; and then, as on previous occasions, it was shown to the California Academy that the phenomenon of Baily's Beads, the "black drop" in transits of Mercury and Venus, and similar phenomena, were the results of atmospheric disturbances. This view has been strongly controverted, but now leading astronomers are satisfied of its soundness. No other explanation, such as the diffraction of light, the existence of lunar mountains, peculiarities of the telescope, etc., explain all the phenomena observed, and especially fail to account for the phenomenon exhibited when the Baily Beads, etc., are not present.

It is to avoid this atmospheric disturbance that the Coast Survey party has chosen to reach the more difficult station on the path of totality in the Santa Lucia mountains, about 35 miles southeastwardly of Point Pinos, and Prof. Frisby of the U. S. Naval Observatory has also determined to occupy the same locality with his instrument.

Of course, where the whole available time of totality is only about half a minute, it is a miracle if any other work is done than obtaining the epochs of the first three contacts. Yet the Coast Survey party is prepared to determine the position of any intra-Mercurial planet, should one fortunately be discovered. It is safe to say that there are a million of chances to one against catching such an object, and yet the millionth chance may be the first one that turns up. There will be five instruments and five pairs of eyes accustomed to observing; the station will probably be over 5,000 feet above the sea. If the day is propitious, the observers may expect an atmosphere so steady that stars of the fourth and perhaps of the four-and-a-half magnitude will be visible to the naked eye. It happens that no star of the fourth magnitude lies within 10° of the sun; but to familiarize the observers with the heavens in the vicinity of the sun, a map has been prepared, to embrace 16° on each side of the sun, in the line of the elliptic, and 8° above and below this line. This chart exhibits stars down to the seventh magnitude, although it is doubtful if stars of less than the fifth magnitude can be seen by the sharpest eyes or even with an opera glass. Nevertheless they would be visible in the telescopes and might prove serviceable objects for comparison.

The letters of Peters, Watson and Swift in the *Astronomische Nachrichten*, upon the subject of the Vulcanites supposed to have been seen by the two latter observers, indicate the great doubt which exists upon the subject of the intra-Mercurial planets, a doubt which is shared largely in Europe. Whilst the observations of such experienced men as Watson and Swift may not be doubted under all ordinary circumstances, yet under the extraordinary conditions attending their measures in July, 1878, a reasonable doubt may fairly be entertained as to whether they saw two new inferior planets or two stars. And this subject must remain obscure until observations are secured admitting of no doubt.

According to Hind we may reasonably expect to increase our knowledge of the physics of the sun, and of the existence of vulcanites at the following important total eclipses among others, which occur in the next twenty years:

Date. Year.	Date. Month.	Most Favorable Locality for Observation.	Duration of Totality.
1882	May 17.....	Arabia.....	2′ 00″
1883	May 6.....	Marquesas Islands.....	5′ 15″
1885	Sept. 9.....	New Zealand.....	2′ 00″
1886	Aug. 29.....	West Africa.....	6′ 21″
1887	Aug. 19.....	Russia.....	3′ 49″
1889	Dec. 22.....	Angola, West Africa.....	3′ 34″
1893	April 16.....	Brazil.....	4′ 44″

It will be noticed that the length of totality in several of these eclipses is remarkably prolonged, affording unusual opportunity for systematic, calm and deliberate observation.

In the meantime we may expect that new instrumental means and methods will be devised for the solution of questions of solar physics yet in doubt; and it is not beyond the bounds of probability that the instrumental means may be utilized even without eclipses, as has been the case in the spectroscopic observations upon the sun flames at any time.

Recent eclipses have set at rest the question of the corona being a solar appendage not self-luminous, but shining by reflected sunlight; and yet much remains to be done, and even new questions arise as older ones are explained and satisfied.

The next total solar eclipse visible near the United States will be that of May 28, 1900, at 3 o'clock in the afternoon; wherein the central line of totality passes through Mexico, the Azores and Egypt.

In the latitude of San Francisco the eclipse on the 11th instant will not be total, but eleven and four-tenths digits, or ninety-five hundredths of the sun's diameter will be obscured, so that decrease of light will be very sensibly felt.

The first contact will occur at a point on the sun's limb 30° to the right from the lowest point of the disk, 2h. 42m. 3s., mean time for San Francisco.

The disk of the moon will rise nearly vertically over the disk of the sun, and at the latitude of San Francisco above the sea, the sun will set with the moon's lower limb still four minutes upon the sun's upper limb. Were an observer at a great elevation above the sea, he would see the moon leaving the sun at a point twenty degrees to the left of the highest point of the sun's disk.

The time of greatest obscuration will be about three hours and forty-nine minutes, when a bright, narrow segment of the sun will be visible on the right side.

To most persons it will be a novel sight to witness the progress of the eclipse as the sun approaches the horizon, and finally to see the sun set with the small segment of the moon's disk yet upon it.

SUSPENSION AND ELEVATION OF CLOUDS.—M. Oltramare supposes that the altitude of clouds is determined by the force of electrical repulsion between the clouds and the stratum of air below them. If the electricity is uniformly distributed, in accordance with any simple function of the height, the hollow sphere of air above the clouds can exert no influence.

A TERRIBLE story is told of the sufferings and outrages endured by the women of the White River Agency while captives of the Indians.

DURING 1879 the product of precious metals west of the Missouri river, including British Columbia, was $5,805,121 less than in 1878.

SEARCH for the victims of the Tay bridge disaster in Scotland has been suspended, on account of the boisterous weather.

THREE men were killed and two others fatally injured at Newark, N. J., by an explosion in a celluloid manufactory on Monday.

THE shipments of treasure from Portland, Or., by Wells, Fargo & Co. during 1879 amounted to $3,554,507.

GOV. CORNELL was inaugurated Jan. 1st at Albany, N. Y., in the presence of a vast concourse of citizens.

The Tay Bridge.

Details of Construction of the Longest Iron Bridge in the World.

The terrible accident which occurred at the Tay bridge, in Scotland, recently, and the fearful loss of life on that occasion, has called the attention of the civilized world to the danger and liability of accident from lack of strength in bridges; and civil engineers everywhere will have a fruitful source for discussion for some time to come. The traveling public will look to the engineering profession to correct in future structures the defects which must have existed in the one so lately destroyed, which will necessitate a most careful and searching investigation into every detail of construction. The exigencies of our modern systems of land transportation, in which the railroad is the great factor, have necessitated the building of bridges of more magnitude of proportion than formerly, in order to open communication with fresh centers of industry, and afford facilities not only for passengers, but those commodities which contribute alike to national and individual wealth and comfort.

It is to that noble band of workers who, with wise head and busy hand, are doing what they can to promote the progress of physical science and to extend the dominion of man over the power of nature, that we look to insure us against accident on structures of this character. They set themselves to grapple with and to overcome difficulties of no ordinary kind—physical difficulties which, to the common mind, seem insuperable; and yet success has crowned their efforts in so many cases that this one failure, so marked in its results, will meet with closer scrutiny and attention from every individual in the profession than would any proposed principles, schemes or plans, of whatever magnitude.

Iron Bridges.

Although we are told by Du Halde that iron bridges originated and were first used in China, the first of which we have authentic record was an arch of cast-iron spans erected over the Severn at Coalbrookdale, Shropshire, England, by Abraham Darby and John Wilkinson, in 1779. When increasing trade required greater facility for carrying passengers and freight, the arch was found inadequate to carry a roadway over an arm of the sea or a broad and swiftly flowing river. Accordingly the idea of suspension bridges was carried out, numbers of which are to be found all over the world. It was soon found, however, that the legitimate use of suspension bridges was the carrying of ordinary roads over large spans where the loads were not so great nor motion so swift as on railways; and although many of them are used for railways, more solid structures are preferred where practicable. In searching for some other form of roadway, when the younger Stephenson was employed to carry the Chester and Holyhead railway across the Menai strait, he proposed to effect his purpose with a circular tube supported by chains. It is said by some, however, that the idea of this wrought-iron tubular bridge and the carrying out of the details of construction which made it a success are due to Fairbairn's, to whom the credit is due of devising the form and proportions of the tubular bridges of Menai and Conway. The rectangular cellular beam laid on its edge and made of wrought and cast iron in their respective places, was Fairbairn, as was also the idea of making it self-supporting. Stephenson gave up, very reluctantly, the idea of supporting it by chains. A similar principle, that of the truss beam, has been applied, varying of course in details of construction, all over the world. The success of the Britannia and Conway bridges led to the construction of many similar, such as the Victoria bridge over the St. Lawrence, etc.

Successful as these bridges were, the waste of material was too great to allow engineers to rest on the idea that nothing more required to be done, and it was ultimately found that the lattice girder, such as was adopted on the Tay bridge, would be as strong, and by presenting less surface to a gale of wind, as secure.

Difficulties to be Overcome at the Tay.

The most notable difficulties in connection with the construction of the Tay bridge were caused by the boisterous character of the weather in the river, and the nature of its bottom. Each of these circumstances by itself would have rendered the use of ordinary scaffolding and staging impracticable. Had this not been the case, the cylinders might have been built, lowered and steadied from a reliable staging, and the girders, during their erection, rested on secure scaffolding till they were finally connected to the piers. Everything would thus have been plain and straightforward, and the bridge would only have differed from a thousand similar structures all over the world by the fact that it is the longest of them all. As it was, however, new methods of construction had to be invented and tried, sometimes at considerable expenditure of time and money. It is, of course, necessary to introduce modifications to suit different circumstances. In the methods employed at the Tay bridge, there were many which had never before been used, and these possess a high interest for the professional engineer and the general public, especially in view of the disastrous results. The work was much more difficult to perform than was anticipated, as the nature of the river bottom turned out to be quite different from what the official borings had given reason to expect. The plans for foundations and piers had to be materially altered. Contracts for ironwork had to be undone, and new ones entered into, and a "plant" had to be made to suit the altered method of working, after a good deal of work had already been done.

Inception of the Idea.

It is to Mr. Thomas Bouch, when engineer and traffic manager of the Edinburgh, Perth and Dundee R. R. Co. that the bold design of bridging not only the estuary of the Tay but also that of the Forth is due. In his official capacity he had frequently been a witness of the inconvenience and danger of the ferries at Tayport and Burntisland, and a fatal accident at the latter place in 1849 quickened his perception of the costliness and clumsiness of that system. It was not, however, until 1854 that he proposed the scheme to the directors of the Scottish Northeastern R. R.; but he was looked upon as a dreamer, and it was not until 1863 that a public proposal of the subject was evoked, when the first public expression of a belief that the "Storm Fiend of the Tay" might be met and defied in his own domain was made in the Dundee *Advertiser*.

History of the Undertaking.

The local and Parliamentary history of the Tay bridge bears too much resemblance to that of all great schemes of improvement, and the narrative is full of conflicts, struggles, obstructions and hindrances. From the time in 1864 when Parliamentary notice of a bill to provide for the incorporation of a company to build the bridge, until the time the work was started in 1871, there was a continual fight between railroad companies, promoters, Parliamentary committees, town councils, harbor boards, etc. Four or five plans were adopted, drawn up in detail, and then changed. Numbers of people were possessed of grave doubts as to the *bona fide* nature of the scheme, and looked upon it as a strategical manœuvre of the North British R. R. Co. to bring opposing interests into their designs elsewhere. The town council of Dundee, while they did not object to the bridge, wanted a footway for passengers; the trains arranged to suit the convenience of the public; and the fixing of a specified rate of fare within reach of the whole community. To prevent an undue use of proprietorial rights, they wanted more than one company to have an interest in the bridge; and they insisted on a double track. The Dundee Harbor Trust also entered into active opposition; and the Perth Town Council, in the interest of their decaying shipping trade and port, put in a claim to be heard against the contemplated obstruction of the river. It was to the latter influence that concessions were made necessitating the hight of the bridge above tide water and the width of span with which the bridge was built.

It was during this fight that the question of the right of Scotch municipalities to defend the interests common to all was denied. It was decided, however, that they had, a most important victory for the governing bodies of the Royal Burghs of Scotland. If they had submitted to the decision which deprived them of all power to interfere on behalf of the communities they represented, such submission would have formed a precedent quotable against them in future emergencies of a like nature, and railway companies would have used their new-found powers without consideration of other interests than their own. After difficulties were all settled, rights to shore line granted, certain acres sold for stations, etc., opponents came, within the North British R. R. Co. itself.

The Disaster Predicted.

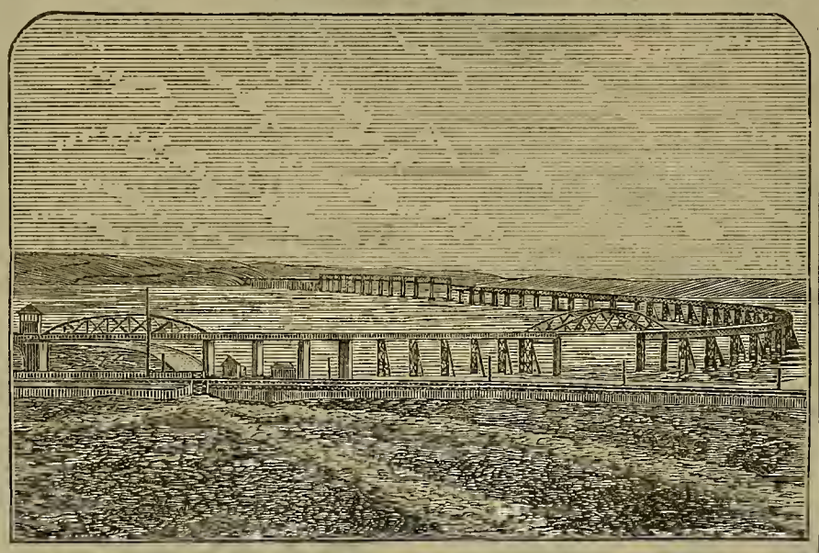
Then Mr. Patrick Matheu, in a series of letters to the Dundee *Advertiser*, endeavored to shake faith in the scheme. He did not think they could build this "high slender rainbow-like structure strong enough to protect it from the fury of the waves or the destroying breath proceeding from the storm throat of the Tay." He thought that "deep channels would be scooped out by the increasing current around the piers," and that the foundations would be undermined; or that vessels dragging their anchors might destroy a pier. Among other things he wrote: "Yet a little while and a train filled with happy people is swiftly proceeding along the tortuous structure. Its weight and velocity act with such a centrifugal force upon the curve that the workmanship is unable to bear the strain; the bridge opens up and the train with its human freight is precipitated into the river a hundred feet below. An islet is now seen in the Firth where no islet existed before, and its component parts are stones, fragments of iron and of wood, together with mangled human bodies, and the eels are gliding in and out between the interstices of the horrible scene. The bridge itself is a wreck, never more to be used as a means of communication between the counties of Fife and Forfar."

This gentleman died before the bridge was completed, and his assertions were so ridiculed at the time that they earned for him the soubriquet of "The Seer of Gourdie Hill." His prophecy came true, however, by whatever means the catastrophe was brought about.

What had to be Done.

There is little doubt that the railway company would willingly have made the bridge to carry double tracks, but the tardiness with which the stock was taken up made it incumbent on them to provide for nearly a third of the capital required. They were, therefore, compelled to content themselves with the single track, and to rely upon its success as a single track line to induce the public to provide additional capital to double the means of transit.

The bill allowing the arrangements to be carried out passed the House of Lords in July, 1870, and in a few weeks received the Royal assent. Details then had to be considered of the great work.



THE IRON BRIDGE ACROSS THE FRITH OF TAY.

It was the erection of a railway bridge over the widest tidal river that had ever been spanned—a river with a deep rapid current, and subject at all seasons to violent gales which sweep down the estuary, as through a funnel, with the concentrated force of a tempest. On all hands the difficulties were admitted to be very great, while not a few regarded them as perfectly insurmountable, boldly asserting that in a trial of strength it would be found that engineering skill would be unable to cope with the forces of Nature. But the construction of the high level pontage, in itself to be regarded as a signal trumpt of science, was an undertaking of paramount importance to the North British R. R. Co., not only because it would more effectually open up the collieries of Fife and shorten the distance between Edinburgh and the North, besides saving the cost of ferry and tollage (about £13,000 per annum), but more particularly because its erection was the initial step towards the far greater object in view—the bridging of the Forth; and accordingly the scheme was entered upon with resolute determination, which was an omen of success.

The Engineers.

To Mr. Thomas Bouch, the North British Railway Company's eminent engineer, the originator of the scheme, the plan of the Tay bridge is due. The *modus operandi* for its construction was left to the contractors, Messrs. De Bergue & Co., and afterwards Messrs. Hopkins, Gilkes & Co. The managers for these contractors were Albert Grothe, Edward R. Austin and Mr. Edgar Gilkes. The Railway Company's resident engineer was Mr. Wm. Paterson. An enthusiastic staff of young engineers were also enlisted, of whom Mr. Reeves invented the sand pump, which did so much to facilitate the work; Mr. Frank Beattie devised the appliances for lifting the 245 feet spans to their resting places 88 feet above high water, and Messrs. Delprat, G. W. Camphius and T. C. de Bruyn.

Length of Spans.

As a melancholy interest attaches itself at the present time to this famous bridge, a brief general description will enable the reader to understand more readily what few details of the process of its construction we propose to give; and the engraving shown herewith gives a general view of the completed structure.

Starting from the Forth end the bridge crosses the river almost due north and south for about three-fourths of the distance, when it makes a curve, having a radius of 20 chains, to join the land line which runs at right angles. The bridge is 3,450 yards in length, and consists of 85 spans of the following dimensions:

11	spans	of	245	feet	each,	lattice girders.
2	"	"	227	"	"	" "
1	"	"	168	"	"	bowstring "
1	"	"	162 10	"	"	lattice "
13	"	"	145	"	"	" "
10	"	"	129.3	"	"	" "
11	"	"	129	"	"	" "
2	"	"	67	"	"	" "
24	"	"	67.6	"	"	" "
3	"	"	67	"	"	" "
1	"	"	66.8	"	"	" "
6	"	"	28.11	"	"	" "

Construction of the Piers.

In the case of the two spans of 227 feet and the 11 of 245 feet, and on the bowstring span, the roadway is carried on the bottom booms of the girders, while on the other spans it is laid along the tops of the girders, this arrangement, in the case of the wide spans in the center of the river, allowing a clear water way for the passage of vessels to and from Newburgh and Perth. The piers are of varied construction, but in most cases the foundations are formed of iron cylinders filled in with brick and concrete. Piers 1 to 14 are entirely of brick in cement. Piers 15 to 48 are brick for five feet above high water, finished with a stone belting, upon which are carried groups of cast-iron columns braced together. Piers 49 to 77 consist of groups of cast-iron columns braced together, starting from the cylinders and encased in brickwork to a hight of five feet above high water. Piers 78 and 79 are cast-iron cylinders throughout, filled with concrete. Piers 80 to 84 are cast-iron columns. In form the bridge is slightly arched, the greatest hight being at center of large spans—88 feet. The gradient is 1 in 365.

The chief difficulties were connected with the formation of the piers under water. In previous years the only plan of constructing such piers was by forming a coffer dam and then pumping out the water and building from the foundation; had no other mode been available, this bridge would never have been built on account of the expense.

Floating out the Piers.

The piers and girders were built on shore and floated out to their destinations, so as to dispense with heavy staging and scaffolding. A place on the beach was leveled and a concrete floor laid. The first plan adopted was to build and sink separately the two cylinders composing each pier. Each cylinder was laid on the concrete floor, filled with a lining of brick-work up to low water level, leaving an opening at the center. This then, weighing 40 tons, was floated out on pontoons and sunk. The water was forced out by air, men went in, and as they dug the pillar settled till rock was reached. Concrete was then put in. Trouble was experienced from the narrowness of the base of the cylinders, as they would very frequently list over; so they discontinued the practice of sinking the cylinders singly. To overcome this difficulty it was resolved to make each pier, not of two separate pillars, but as a complete structure, consisting of two engaged cylindrical pillars rising from a common base, having long straight sides and circular ends. This plan was very satisfactory. For the construction of one of these combined piers there was provided, first of all, a wrought-iron base 3 feet high, 22½ feet long and 10½ feet wide, with flat sides and circular ends, which was laid on the temporary concrete floor on the beach. This base was surmounted by a conical cast-iron cap 4 feet long, furnished with a top flange 2½ feet wide; the base and sur-base making a hollow chamber 8 feet high, and big enough for two gangs of six men each to work in. On the broad flange of the sur-base brickwork was carried up to the level of low water in two circular towers, 9½ feet in diameter, surrounded by cast-iron cylinders of ⅜-inch metal in four segments; a shaft 4 feet in diameter being left in each tower for the descent of the workmen to the chamber at the bottom. To transport this very

Unwieldly Mass of Brickwork

Of about 140 tons in weight from its temporary resting place ashore to its permanent position in the bed of the river, a simple but ingenious arrangement was introduced by Mr. Austin.

Two pontoons, each bearing two strong malleable iron girders, besides hydraulic rams to lift 60 tons each, were floated, so as to bring the pier into the center between the girders. The latter were connected by wrought-iron links with the base of the pier, which was provided with vertical suspending links. To these were connected a pair of balancing cross head plates, while the upper and lower sets were attached to the wrought-iron links. The hydraulic rams had a stroke of 12 inches, and the links,

[CONTINUED ON PAGE 28.]

Hidden Treasure Mining Company.

Through the courtesy of the officers and members of the company we have received through M. H. Power, Secretary, the annual statement of account of the Hidden Treasure mining company, located at Sunny South, six miles above Michigan Bluff, in this county. From the day gravel was first struck in this claim, which was about May, 1876, the mine has proved a success, and consequently we have at various times had occasion to revert to its operations. Never before, however, have we been able to give exact figures, data which is always gratifying to the publisher, and particularly so to the inquiring public. The statement for the year commencing Jan. 1, 1879, and ending Dec. 20, 1879, is as follows:

RECEIPTS:

Jan. 1, 1879, cash on hand	$112.25
December 20, cash received for sale of gold dust during the year	98,437.15
Cash received from sundries	236.89
Total receipts	$93,786.29

CONTRA:

By cash paid for wages	$36,530.34
By cash paid for other purposes	7,967.60
By cash disbursed in dividends	53,280.00
By balance on hand	8.35
Total	$97,786.29

This showing we consider a peculiarly gratifying one. A mine that distributes $37,530.34 in wages each year is a good thing for the country, though it should do little else. When, however, a mine, after distributing this large sum as wages, distributes the much larger sum of $53,280 among its stockholders as dividends, it certainly is a very desirable property for the country in general and the stockholders in particular. Few mines in the State, we believe, according to its capacity, can make a better showing. Another gratifying feature connected with the marked success of this mine, is the fact that its owners are nearly or quite all practical miners and withal an exceptionally fine lot of steady, sober, industrious and intelligent gentlemen. Still another encouraging feature is the fact that it is a mine that promises to last for many years.—*Placer Herald.*

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The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions free from all technicalities, and in such a style as to be easily comprehended. It is written for the minor, with no hemical symbols or metallurgical technicalities to confuse hose who are not chemists or metallurgists. The follow ng summary of the contents of the work will give an dea of its scope:

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working same ple, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Krochnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings and settling tanks; dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners' and prospectors' use. Price, post free, $2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 202 Sansome Street, San Francisco.

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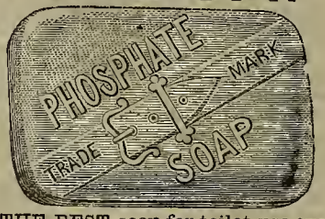

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A. J. SPENCER, M. D.
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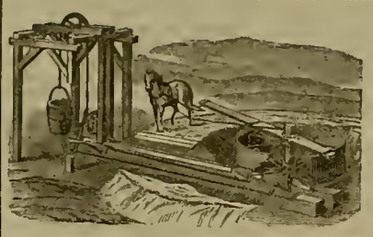

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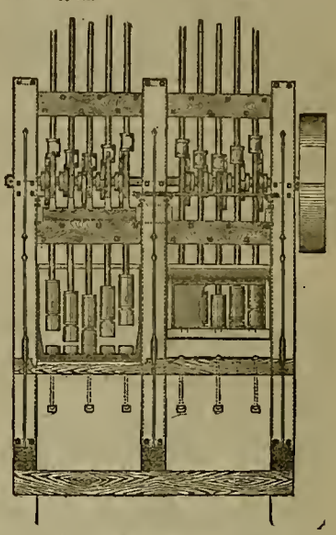

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CONTINUED FROM PAGE 21.

depth is of better quality than anything yet taken out. The tunnel is being worked from both sides of the hill, and the width, 750 ft, will soon be tunneled.

NEW DISTRICT.—The Siegle district, Sierrita mountains, about 30 miles southwest from Tucson, is attracting considerable attention. A. H. Soles is in this week and has received highly satisfactory assays from ores brought from his mines. On his last trip he took up the 1814 mine, so called from its apparent antiquity. He finds an old tunnel which he entered to a depth of 110 ft, and was obliged to return, his light going out. The tunnel shows a good vein of ore with clearly-defined walls. There seems to be in this immediate vicinity many such veins.

MODEL MINE.—*Miner*, Dec 26: The Model mine, in Peeples' valley, has paid its way for several months, and left a large dividend for its owners.

PLACER GOLD.—Mr. C. C. Bean informs us that during the summer and fall just passed a number of Mexicans have been working the placer claims on Arastra creek, between Walnut Grove and Peeples' valley, and that they have weighed their earnings on the scales of an American living in that vicinity, amounting to over $10,000. This is a new quarter which has been producing gold in paying quantities.

REDUCTION WORKS.—George M. Pinkham, of Oakland, Cal., arrived in Prescott this morning and informed us that he has purchased a complete quartz mill for his mines in Mohave county, which has just been shipped from the foundry of Scott, Prescott & Co., San Francisco, weighing 240,000 pounds. The mill will be one of the most complete ever put up in the Territory. We understand there is in the treasury sufficient funds to pay for everything and much more, therefore we expect to see the grandest reductiou works in Mohave county ever put up in Arizona.

COLORADO.

VIRGINIUS.—*Register-Call*, Dec. 26: Prof. R. W. Woodward, Vice-President of the Windham smelter, San Juan, Ouray county, states that he has milled 80 tons of ore from the Virginius silver mine, which ran as follows: First class, 781 ounces per ton; second, 395 ounces; third, 225 ounces. There was only one ton of third class. The Virginius is one mile from the Snuggler, on the same mountain.

CALIFORNIA.—The mill ore from the 1000 level in the California mine, on Quartz hill, is running nine ounces gold per cord.

IRENE.—Capt. John H. Bowen will commence developing the Irene lode, in Quartz Valley district. The main shaft is to be carried down to a further depth of 100 ft.

KINGSTON.—Two drifts are being run west in the main shaft of the Kingston vein, property of the Illinois mining and milling company, of Chicago, which vein is in Russell district.

PYRENNES.—The recent lessees of the Pyrennes lode, west of the Nimrod, in Russell district, have commenced to work the mine.

CYCLOPS.—The last lots of ore sold from the Wilson & Cross shaft on the Cyclops vein, Silver mountain, gave a return of 250 ounces per ton for the first class and 85 per ton for the second class, over and above treatment.

WHITNEY.—The contractors for sinking the last lift in the Whitney main shaft, in Eureka mining district, are driving work.

HARKAWAY.—It is quite probable that the Harkaway mining and milling company will resume work in the main shaft of the Harkaway mine shortly. The new 10-stamp mill and other machinery has all been received.

PEWABIC.—A large-sized pump will be put into the Pewabic mine, in Russell district. It is being removed from Blackhawk and will be in position soon.

COMMONWEALTH.—*Miner*, Dec. 27: This mine is owned by J. B Johnson, and is located in East Argentine district. Joe is running in an adit on the lode, which is now about 200 ft in length and carries five inches of ore of fair grade.

ANDREWS LODE.—This mine is located near the Main Range, and is owned by a Boston company, which is developing the property.

SHIVELY.—Has erected mining machinery and made permanent improvements. During the past six months a tramway 1,500 ft in length has been constructed from the gulch to the mine. An engine has been erected on the dump for operating the tramway, and a large hoisting engine has been placed in the subterranean chamber on the Fletcher tunnel, blasted out for that purpose, and a couple of Ingersoll drills and a Clayton air-compressor are to be added soon. The Shively has invariably carried high-grade ore composed of sulphurets and argentiferous galena, and fine specimens of ruby silver have frequently been found. The sinking of the engine shaft and the drifting ahead of the Fletcher tunnel will be the principal feature of development henceforth. The Shively is one of our best mining properties.

IDAHO.

OWYHEE.—Butte Mountain *Miner*, Dec. 23: A recent crushing of 120 tons of rock from the Owyhee mine, yielded over $21,000. This mine continues to hold its own in the way of contributing to the bullion shipments of this section of the country.

YANKEE FORK.—*Herald*, Jan. 3: The Hope is looking well. The tunnel being driven on the vein will be continued a distance of 100 ft, which will give it a depth of 75 ft from the surface. We were in error last week in stating that the tunnel was being run to tap the vein. It was started directly on it and will so continue.

MINE TAPPED.—*Idaho World*, Dec. 27: Mr. Hugo Bayhouse was over from Centerville two or three days ago. He informs us that he and J. L. Jackson, who relocated the quartz mine about a mile this side of Centerville, a short time ago, have tapped the mine with a tunnel and found a good body of ore. It will average about $30 per ton. The owners of the mine are putting the tunnel in shape, preparatory to stoping.

MONTANA.

RICH STRIKE.—*Northwest:* A rich quartz strike is reported from the district at the head of First Chance. Henry Grant is the owner of the lead. A shaft was sunk last winter, but no quartz of any value was discovered, and the vein was lost. A tunnel was started in to strike the shaft, and in running it the vein of gold-bearing quartz, said to be the richest by far in Montana was discovered. There is considerable excitement over the find in and around Bear. There are many locations in the immediate vicinity of Mr. Grant's lode.

DISPATCH.—Butte Mountain *Miner*, Dec. 23: This mine, owned by Farlin Bros., lies directly east of the Dexter mill. Three shafts have been sunk on this claim. Ore was extracted which worked 102 ounces. The west drift from the bottom is in 30 ft, and shows two ft of ore. Ore has been extracted from shaft No. 3 which worked 125 ounces.

ALICE MINE.—The contractors have resumed work on the 500 level, and are pushing the drifts east and west as fast as possible. They are opening up a great deal of exceedingly rich ore. On the 400 level the breast of ore now opened is nearly 50 ft in width, some of which is of high grade. They are extracting about 25 tons of first-class and 15 of second-class ore daily.

WESTERN WORLD.—This mine, owned by Messrs. Owsley, Allport, Ransom & Frank, is situated directly west of the Andy Johnson. Two shafts have been sunk to water level. A lot of ore was extracted in this portion of the mine which assayed 45 ounces in silver and $7 in gold.

MORNING STAR.—The new shaft on the east end of the mine is down about 20 ft. It is sunk south of the croppings. The bottom of shaft No. 2 shows a streak of high-grade free ore 22 inches in width. From the west drift, 50 level, considerable high-grade free ore is being extracted.

ANCIENT.—This mine, situated on the Black Chief lode, is owned by W. A. and Jos. K. Clark. A tunnel was run north 200 ft near the surface and showed a ledge formation from 50 to 60 ft wide. Three shafts have been sunk on different spurs, the deepest of which is now down about 40 ft; from this shaft considerable ore has been extracted, which worked in the Dexter mill from 30 to 50 ounces.

The Tay Bridge.

CONTINUED FROM PAGE 25.

passed through slotted holes in their hases, were perforated with holss corresponding to stroke of rams. Being fixed to the piers at low water, the girders gradually,lifted as the rising tide raised the pontoons, and the whole mass was suhsequently towed out at high water, the weight of the pier, which was suhmerged 8 feet, being carried on steel pins. When the pontoons had been securely anchored, the lowering process hegan. To lower the pier, the cross-heads on the rams were connected hy pins with the links at the top of the stroke. Then

The Hydraulic Force Pump,

Of which there was one on each pontoon, with a few strokes raised the pier ahout an eighth of au inch, so the weight was no longer on the steel pins, which were then drawn out and placed in the link holes a foot further up. By means of cocks the water was let out of the rams, first on one side and then on the other, and the pier lowered until ths steel pins again rested on their hearings. The cross-heads wsre then disconnected, and the rams pumped up again to the top of the stroke. As ths lowering proceeded, liuks, four feet long, were added, and the whole apparatus, although weighing ahout 140 tons, was under perfect control. It was lowercd about one foot in five minutes, so by full ehb it was grounded on the river hed. During its settlement in the silt the pier was carefully watched by a spirit level, and any tendency to sink unsvenly was checked hy the hydraulic rams heing pumped up on the lower side.

When once the pier was settled in its proper site, temporary cast and wrought-iron caissons were fixed upon it, so as to briog it ahout six feet ahove bigh water, and brickwork was then carried up until weight enough was added to prevent the pier floating when filled with air during the process of sinking it in rock foundation. This operation was effected by

Two Air Bells,

With pumpe and engines attached, which were fixed to the top of the caissons. Air was pumped down the shafts of the piers until the water was driven out of the chamber at the hottom, to which the workmen then descended in diving dress and excavated tbe soil. The sand and gravel were sent up in huckets through lock-shoots in the air-hells. As the pier sank by its weight, two hydraulic telescopic legs steadied it. On reaching rock the foundation was levcled. The working chamher was then filled with concrete, under air pressure, the flanges carrying tbe hrickwork being carefully packed and run in with cement concrete. The shafts were next filled up, tbe air-bells and temporary caissons removed, and brickwork carried up to the requisite hight.

Difficulties With the Foundations

Were greater than anticipated. The rock hed suddenly dipped to a depth practically inaccessible, which led to a complete change in procedure. The original plan contemplated the erection of solid brick piers for supporting the girders over the greater part of the river, it being understood rock formation would be found. The contractors had, however, not only to form an artificial rock foundation, but also to lessen the *top* weigbt. The latter object was gained by suhstituting groups of iron columns in lieu of brick, ahove high water, while an artificial rock foundation was made hy forming oval beds of concrete, laying them on the clay or gravel. In some places, piles 40 feet long were driven in before these concrete beds could he laid. Caissons were used in forming these heds, but sinking them was troublesome. At last Mr. Reeves devised

A Sand Pump.

He placed four receivers of upright iron in a small lighter with necessary engines and air-pumps, tuhes leading from said receivers down into the caisson. By exhausting the air ahove, and having divers holding the ends of the pipes helow, the silt and water rnshed up into the receivers. As the soil was removed from the interior the caisson gradually sank, and at a depth of 18 or 19 feet, clay or gravel was generally reached. Ahout two and a half minutes served to fill a receiver, sand forming one-third of its contents, and, as dnring this time the engine was exhausting one of the other receivers, the work was continuous. About 100 tons of material a day were thus raised. A machine on a similar principle tried in our California river heds for gold mining, was not successful, no euch amount heing raised.

The Caissons.

The caissons were then packed with concrete, and a mound of ruhble raised around the hase to protect it from scour of the river, and the result was the formation of a solid foundation, capable of sustaining the immense weight of the superstructure. When the temporary caisson was removed, the coucrete foundation projected ahout a foot above the river bed, ready for reception of the pier. The lower portion of the pier, permanently under water, was bnilt of cemcnt and brick *on shore*, with tbe center hollow. Being 22 feet deep, the brickwork, when securely fixed on its foundation, had its top level with the surface at ebb tide, and the men then filled in the cavity with concrete, and huilt up 14 feet of solid hrickwork more, to high water. Four courses of stone, five feet thick, were then put in, to form a base for upper worke. These consisted of eix iron columns, 12x15inches, cast in 10 feet lengths, and securely holted together and made fast to each othsr hy hraces. Fourteen piers of this style hrought the works to the middle of ths river.

The Central Spans where the Accident Occurred.

To span over the central portion, the plan was modified, and the central spans increased from 200 to 245 feet. Owing to the immense weight of the girders (190 tons) for each of these spans, the artificial rock foundation was enlarged to a circular hed of concrete 31 feet in diameter. A caisson for this was 45 feet high and 31 feet broad, like a large gasholder. It was made of wrought iron, and 20 feet of it, to penetrate the rivsr bed, was stiffened with a 14-inch thick ring of hrickwork. It weighed, when floated out, 200 tons, and four hig rams were used to lower it. The sand pumps wsre used, and the interior filled with concrete.

On this platform so formed, a hexagonal pisce of hrickwork, 22 feet high, 16 feet wide and 27 feet in the direction of the current, was suhsequently fixed, hringing the structure up to ebh-tide level, and the hrick and masonry were thereafter built up a little ahovs high .water level. The diameter of the six iron columns (rising 80 feet ahovc the masonry) which constituted the uppsr works, was snlarged to 15 inches for the four central ones and 18 to the outsr ones. In the construction of these huge pisrs, in the navigahle portion of the stream, it was important to offer as little ohstruction to the current as possihle. To the northward of the 13 wide spans in the deep channel the piers, resting on a gravel foundation, were huilt on ths douhle cylinder principle, the cylinders being 15 feet in diameter.

The piers at the north curve were made of three cast-iron piles, hollow; and Mr. Brunlees devised a plan of sinking them hy pumping water down through them at high pressure, washing out the sand till they found a foundation of hlue clay.

The Iron Lattice Girders and Spans.

The euperstructure of this hridge looked at from a distance gives one the idea of very light iron-work, although it was not so considered. Wrought iron bas heen used in hridge huilding for many years, and the duty of the engineer now includes not the mere calculation of the strength of a girder, hut the selection of the system which gives the greatest strength with least waste of material. For the Tay hridge the latticed girder was employed as giving the requisite strength and *lateral* stiffness, hut the result has proven that in the latter respect an awful mistake must have been made.

To insure the quality of the material no iron was used unless it could stand a tensile strain of 21 tons to the square inch. The pieces of iron forming the girders were erected and riveted togcther on a staging near the shore, and connected to it hy a gangway. Each span had four horizontal pieces, or hooms, two at the top and two at the bottom, and four vertical posts at the ends, the hooms heing of the trough section, and varying from 12 to 21 inches in width. Nine crosses, consisting of struts and tie-hars, kept the hooms at the proper distance, and transmitted the strain to the ends to he supported hy the piers. In the case of the largest spans the struts were of the H section and in the shorter spans, of channel section. The smaller sized girders were 16½ feet deep. For the 245 feet spans, however, the two girdere forming each span were 27 feet deep, and of an aggregate weight of 190 tons; and the work of erecting and riveting them on the staging required four weeks to accomplish, about 18,000 rivets having to he put in each. One of these epans heing completed, part of the staging was taken away at either end, harges were then introduced iuto the gaps and at high water the mass of iron-work was towed out and moored in position. Ae the tide fell the girders settled in the piers and the harges were then withdrawn.

The raising of the girders was effected hy means of hydraulic apparatus, placed on stages holted hetween the colnmns, and the services of 80 men were required to raise the span 20 feet per day—the usual rate of progress.

Expansion and Contraction of the Iron.

In construction of the girders due provision was made for expansion and contraction of the iron, which is reckoned at 7 feet over the whole length of the bridge. The spans were arranged in eets of four, five and six, each set having its own fixed and expansion bearinge, admitting of eelf-adjustment at 21 different places. In each group only one of the pieces is firmly fixed to the superstructure; the ends of the girders meeting on it being firmly bolted down; while at tbe other piere of the set the girders rest on rollers over which they can elide when expansion or contraction takes place, according to varying conditions of temperatnre. To defects in eome of the details in this part of the arrangement some persons attribute tbe accident that occurred, fearing that due provision was not made for lateral strain caused by the high winds. At the inception of the work, however, this point was thoroughly discussed; and indeed, it was on account of the prevalent high winds that many did not believe the bridge would stand. The engineers therefore had warning enough on this point to have exercised the greatest care.

It is a fact, however, that experience proved they by no means allowed sufficient margin for elemental forces to be encountered in the progress of the work, and the promoters proceeded on data which subsequently proved inaccurate in eeveral essential particulars. It will now he said with reason, that the engineere followed in their footstsps. As to the weather, sometimss they only had five or six days a month in which they could work. In the winter of 1874, for three months no work was done ontside the jetties. In 1876 two electric lights, each 1000 candle power, wers hrought into operation to forward the work, and the men worked by night as well as by day. The first train crossed the hridge in September, 1877, hut it was not formally opened until May, 1878, when appropriate ceremonies were held. Before that, however, six locomotive engines and tenders, weighing 438 tons, wers passed over to prove the psrfect stahility of the structurs.

Several Accidents

Occurred while the hridgs was huilding, as would of course hs the case with from 500 to 600 men at work. Several of the cylinders capsized from ths irregular hottom; the air-hell and engine were thrown into the water. At one time while nine men were excavating the sand, the cylinder exploded, killing six of them. A searching inqniry was made, hnt ths exact cause of ths explosion was nevsr ascertained. During a heavy gale in February, 1877, two of the largs spans and one girder of 145 feet span adjoining them, together more than 400 tons in weight, were hlown down. Ths iron part of ths piers on which they were supported was complstely wrecked. Only one man was killed, although 40 men were on a girdsr near hy which was hsing raised, and had to stay there all night in the gale. Anothsr time a girder, heiog floated out on the harges, hroke away from the tugs in a gale, and, although drifting around all right, was saved next day. A striking illustration of the adhesivs qualities of cement may here hs cited, as shown in the case of the pillars huilt of hrick, set in cement, which were overeet and then fished out. Although only huilt two weeke previous, they acquired the solidity of rock, and it took dynamite to hreak them up.

In the constructton of thie hridge there were nsed 3,520 tons of cast iron, 6,281 tons of malleahle iron, 90,600 cuhic feet of lumher, 8,600 tons of cement, 4,350,000 hricks, 27,000 cuhic feet of dressed ashlar and 355 cuhic yards of rough ashlar.

Hight of the Piers and Girders.

The deepest part of the river is ahout 2,200 feet from the Fife ehore, where the depth at high water during spring tides is from 40 to 45 feet. The rise and fall of tide varies from 12 to 17 feet, and the current in that part of the river is ahout fonr miles an honr. The greateet hight of pillar occurs at the first of the wide spans on the south side, the extreme hight from the foundation in the hed of the river to the underside of the girdcr heing 142 feet. Adding to this the depth of girder, 27 feet, gives a total of 169 feet—figures which help to convey an idea of the stupendous character of the work.

The permanent way is of donhle-headed eteel rails, and provided with guard rails. The floor of the bridge hetween the longitudinals is of three-inch plank, covered with a waterproof composition. All the ironwork is coated with hlack varnish to preserve it. There is also a suhstantial hand-rail for the inspectors, and a tuhe carrying 13 telegraph wires.

The Stations.

The esplanade gronnds connected with the hridge are magnificent in character. A tidal hasin was filled in, a viaduct 1,020 feet long, and 4,000 feet of five-foot thick retaining walle huilt; on it a splendid station and platform, magnificent goods-shed, hydraulic huildings, etc., while there have been laid down on permanent emhankments upward of ten miles of railway. The goods-shed is 400 feet long and 150 feet wide, huilt of wood, iron and glass, there heing over 70,000 square feet of glass in the roof. The passenger station ie 380 feet long, heantifully huilt, with an iron roof, fully glazed. An 1,880-foot tunnel, 25 feet wide and 16 feet high, also connects with the station.

Notices of Recent Patents.

Among the patents recently ohtained through Dewey & Co.'e SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

RAILROAD CHAIR.—John R. Sullivan, San Rafael, Cal. Patented Dec. 30, 1879. No. 223,187. This invention relates to that class of railroad chairs wherein two chairs and a connecting metal bar serve to secure the track, the object of which is to provide such a chair as will give a broad eustaining surface to the rail, and yet greatly cheapen its construction. The rail-supporting bases are of cast iron, and in form like a parallelogram. The upper side is made to slope in each direction from the line where the rail crosses it to the outer end, and these inclined faces are grooved so that a large base may he obtained without undue weight. Each pair of bases are united by means of a wrought iron bar which has its ends laid into the mold so as to he cast with them. The top of the base has a douhle elot formed across it, the outer side of one slot having its hottom of the hight at which it is desired to have the base of tbe rail stand, and is beveled under the outer face so that one flange of the rail will be in this groove. The inner part of the slot has its bottom lower than the plane of the upper slot, and the meeting edge hetween the two is inclined and dovetailed or beveled downward and backward. A key is formed so that when in place its contour will he and form a part of the base. The whole forms a cheap and convenient railway tie.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING DECEMBER 30, 1879.

223,102.—ORE SEPARATOR—C. Bennett and P. Burnham, Silver City, New Mexico.

223,028.—CHECK-HOOK—W. M. Blain, Salinas, Cal.

223,114.—MACHINE FOR TARRING WIRE ROPE—R. Cotter, Virginia, Nevada

223,032.—FILLY PLATE—C. Creiger, Comanmes, Cal.

223,187.—RAILWAY CHAIR—J. R. Sullivan, San Rafael.

223,082.—HAY UNLOADER—J. Tyler, Milford, Cal.

223,203.—VEHICLE AXLE—E. A. Wiblo, Folsom, Cal.

7,788.—MEDICINAL COMPOUND—Trademark—Dr. Val. Sechner, S. F.

2,172.—CHOCOLATE—Label—E. Gulttard, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

News in Brief.

THE composer, Wagner, is seriously ill.

A TERRIBLE famine provails in Armenia.

THE famine in Northern Persia is increasing daily.

EX-EMPRESS EUGENIE will visit Zululand in February.

GREAT damage is being done in Franee by inundations.

THE puhlic deht was roduced in Deccmber $4,251,217.

THE Socialistie Congress adjourned *sine die* at Pittsburg Jan. 1st.

LAST year was the most prosperous in the history of Colorado.

THE death of Jonathan Reed, an old Oregon pioneer, is announced.

GEN. GRANT left Savannah, Ga., Saturday last for Fornandina, Fla.

OVER 100 Nihilists have been recently arrested in Warsaw, Russia.

DE LESSEPS was received with great warmth on his arrival at Panama.

THE new California Supreme Court organized at San Francisco on Monday.

CHARLES L. BUOBEY, the well-known architeet, died at Oakland receotly.

PARNELL arrived at New York Jan. 2d, and was appropriately received.

THE country hetween the Volga and Don, in Rnssia, is famine-stricken.

COMPULSORY education is heneeforth to he a feature of the government of Cuha.

SEVERAL survivors from the lost steamer *Borussia* have arrived at Baltimore.

THE navigation of Fraser river is being improved hy tbe removal of rocks.

CHARLES P. LELAND, "Hans Breitman," will visit California in the spring.

BISHOP GILBERT HAVEN, of the M. E. Church, died at Malden, Mass., Jan. 3d.

SERIOUS disturhances have occurred in Brazil on account of the levy of new taxes.

DURING 1879 specie was imported into New York to the amount of $84,260,405.

DURING the last fortnight the Afghans have lost 3,000 men in killed and wounded.

IN New York during 1879, 460 failures were reported, with liahilities of $16,383,932.

COUNT JOHANNES, a well known character on the New York stage, died a few days since.

CHARLES MORGAN, who recently died in New York, left property valued at $12,000,000.

DRIFT ice in the Seine has caused much damage at Paris, and the river is full of wreckage.

A WOMAN attempted to murder a son of Senator Morgan, of Alabama, in Washington Jan. 1st.

A BITTER fight is progressing at Washington against the reappointment of Governor Emery, of Utah.

ABOUT 200,000 pounds of alfalfa seed have been shipped from San Bernardino county this year.

FOUR persons perished in a fire on Friday last at New York, and five others were hadly injured.

IT is denied from St. Petersburg that the establishment of a Regeney in Russia is contemplated.

ONE man was killed and two others severely injured on Thursday Jan. 1st, near Napa, hy a railroad train.

THE famine in the province of Upper Silesia is so severe that people are selling their children for food.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the hack files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

INSURANCE.—We refer to the announcement in another column of the old and well-known fire and marine insurance firm, Hutchiusou & Mann, of No. 322 and 324 California street. They represent twelve companies, with an aggregate capital of $28,000,000.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruher's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Chew JACKSON'S BEST Sweet Navy Tobacco

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their lahors of canvassing, hy lending their influence and encouragiug favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.
B. W. CROWELL—California.
A. C. KNOX—Pacific Coast.
S. V. BLAKESLEE—California.
G. W. MCGREW.—Santa Clara county.
J. B. BACHELDER.—Shasta County, Cal.
JAMES ROGERS—Oregon and Washington Ter.
THOS. H. MANNING—Nevada, Idaho and Montana Ter.
CAPT. W. H. SEAMENS—Arizona.
M. F. OWEN—Santa Cruz County.
H. E. HALLETT—Los Angeles County.
PERLEY P. KILBOURNE—Sacramento County.
M. B. STARR—Contra Costa county.
F. M VARDEN—Alameda Co., Cal.
C. A. MCMAHON—Butte Co., Cal.
W. B. TURNER—California.
J. W. A. WRIGHT—Merced, Tulare, Kern and Fresno counties.

EVERY new subscriber who does not receive the paper, and every old subscriher not credited on the label, within two weeks after paying for this paper, should write personally to the puhlishers without dolay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

A Cylinder Pressman

Of good experience wants a situation in a S. F. or interior office. Understands running an engine. For a steady situation will accept moderate wages. Address "No. 2," this office.

An Engineer

Wants a situation to run a stationary engine in the city or country. Will accept a moderate salary. Address "No. 1," this office.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited hy subscribing for it, or willing to assist us in extending its circulatiou. We call ths attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this papsr, if ordered early. Price, 10 cents, postpaid.

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., January 7, 1879.

CANDLES.

Crystal Wax	17 @17½
Eagle	12 @—
Patent Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits, 2 lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Paull & Co.'s. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 1 lb, doz	6 50 @ —
Preserved Mutton, 2 lb. doz	3 50 @3 62½
Beef Tongue	6 25 @ —
Preserved Ham, 2 lb, doz	6 00 @ —
Deviled Ham, 1 lb, doz	4 50 @ —
do Ham, 4 lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	3 75 @ —
2 lbs	2 75 @ —
Spiced Fillets, 2 lbs	3 75 @ —
Head Cheese, 3 lbs	@ —

COAL—Jobbing.

Australian, ton	6 50 @ 7 50
Coos Bay	— @ 5 50
Bellingham Bay	@—
Seattle	5 50 @ 6 00
Cumberland	13 00 @15 00
Mt Diablo	4 75 @ 5 75
Lehigh	11 50 @12 00
Liverpool	6 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	7 50 @— —
Wellington	— @ 7 00
Charcoal, sack	75 @— —
Coke, bush	60 @— —

COFFEE.

Sandwich Id, lb	— @— —
Costa Rica	18 @ —
Guatemala	18 @ —
Java	25 @— 26
Manila	17 @— —
Greund, in cs	25 @— —

FISH.

Sacto Dry Cod.— hf bbls	2½@ —
do in cases.—	3½@ —
Eastern Cod	@— —
Salmon, bbls	7 00 @ 7 50
Hf bbls	3 50 @ 4 00
1 lb cans	1 40 @ 1 50
Pkld Cod, bbls.—	— @— —
Hf bbls	— @— —
Mackerel, No. 1. Hf Bbls	9 50 @10 00
In Kits	3 00 @ 3 25
Ex Mess	3 50 @ 3 75
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	50 @— —

LIME, Etc.

Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50

NAILS.

Assted sizes, keg	4 25 @ 4 75

OILS.

Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 30 @ —
do, No. 2	1 20 @ —
Baker's A A	— @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl	85 @ —
Boiled	90 @ —
Cocoanut	60 @ —
China nut, cs	72½@ 73½
Sperm	1 40 @ —
Coast Whales	35 @ 45
Polar	— @ 45
Lard	80 @ 90
Oleophine	— @ —
Devoe's Bril't	16 @ 17½
Photolite	— @ —
Nonpariel	— @ —
Eureka	19 @ 20
Barrel kerosene	20 @ —
Downer Ker	30 @ —
Elaine	34½@ —

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60

RICE.

China, Mixed, lb	4½@ —
Hawaiian	6¼@ —

SALT.

Cal. Bay, ton	17 00 @24 00
Common	10 00 @12 00
Carmen Id	12 00 @25 00
Liverpool fine	18 00 @— —

SOAP.

Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	47½@ 50
Cassia	19 @ —
Nutmegs	97½@1 10
Pepper Grain	14 @ 15
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25

SUGAR, ETC.

Cal. Cube, lb	— @ 12
Powdered	— @ 12½
Fine crushed	— @ 12
Granulated	— @ 11½
Golden C	— @ 10½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	25 @ 30

TEA.

Young Hyson, Moyune, etc	40 @ 65
Country pckd Gunpowder & Imperial	35 @ 75
Hyson	30 @ 85
Fooo-Chow O	27½@ 32½
Japan, 1st quality	40 @ 60
2d quality	25 @ 40

LUMBER.

WEDNESDAY M., January 7, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	14 00
Surface	24 00
Rustic	24 00
do, No. 2	18 00
Flooring	24 00
do, No. 2	17 00
Beaded Flooring	28 00
Refuse	20 00
Half-inch Sliding	20 00
Refuse	16 00
Half-inch Surfaced	24 00
Refuse	18 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

REDWOOD. RETAIL PRICE.

Rough, M	18 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	25 00
do, No. 2	17 00
Rustic, No. 1	25 00
do, No. 2	18 00
Battens, lineal ft	

RETAIL PRICE.

Shingles M	2 00
Rough, M	18 00
Fencing	18 00
Laths	3 50

PUGET SOUND PINE

METALS.

[WHOLESALE.]

WEDNESDAY M., January 7, 1879.

IRON.— American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.— Sheathing, lb	22 @— —
Sheathing, Yellow	16 @— —
Sheathing, Old Yellow	8 @— —
Nails	25 @— —
Bolts	24 @— —
Brazier's, in all sizes	24 @ 30
Old	16 @— —
STEEL.— English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
TIN PLATES.— 10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	16½@ 17
ZINC.— By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.— Assorted sizes	3 50@4 50

LEATHER.

[WHOLESALE.]

TUESDAY, M., December 30, 1879.

Sole Leather, hsavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 34
11 to 13 Kil	48 00 @57 00
14 to 19 Kil	61 00 @73 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornellian, 12 to 16 Kil	67 00 @67 00
Females, 12 to 18 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @70 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, palr	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	35 @ 37½
Fair Bridle, doz	48 10 @72 00
Skirting, lb	32 @ 33
Welt, doz	30 00 @50 00
Buff, ft	15 @ 18
Wax Side	15 @ 18

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, January 7, 8 P. M.

SILVER, ½ par.

GOLD BARS, 850@910. SILVER BARS, 10@18 ₱ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 90@90½.

LONDON Consols, 97 5-16; Bonds (4½), 106¼

QUICKSILVER in S. F., by the flask, 39 lb. 39c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending January 6, 1879.

HIGHEST AND LOWEST BAROMETER.

Dec. 31	Jan. 1	Jan. 2	Jan 3	Jan. 4	Jan. 5	Jan. 6
30.452	30.200	30.164	30.215	30.248	30.250	30.150
30.332	30.196	30.110	30.186	30.200	30.184	30.033

MAXIMUM AND MINIMUM THERMOMETER.

49	48	54	52	47	48	49
39	41	42	45	41	44	41

MEAN DAILY HUMIDITY.

76.7	81.3	90	84.3	70.7	81.7	84.3

PREVAILING WIND.

N	N	SE	NW	NE	SE	SE

WIND—MILES TRAVELED.

149	116	105	110	158	120	121

STATE OF WEATHER.

Clear.	Fair.	Cloudy	Cloudy	Cloudy	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

		.12				

Total rain during the season, from July 1, 1879, 0.42 in.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frishie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juan County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capi al stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Fourth (24th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

A. F. MCGREW, Secretary.

Office—Room 7, No 420 Montgomery street, San Francisco, California.

Butte Hydraulic Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Poirson	13	2½	$25 00
L Lapierre	22	2½	25 00
H Marcoux	24	2½	25 00
J B Lussier	25	2½	25 00
John Britt	26	2½	25 00
Geo W Deltzler	37	5	50 00
N Desautelle	41	2½	25 00
Jos Lucier	42	2½	25 00
N Coldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervais	45	10	100 00
Geo Moreau	46	5	50 00
Cee W Deltzler	47	15	150 00
A S Hawes	17	10	100 00
J Callandreau	4	10	100 00
A M Wilder, Trustee	1	10	100 00
A L Lengfeld	5	5	50 00
L L Dennery	6	5	50 00
W E Lutz	7	5	50 00
Geo. H. Powers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francisco California, on Monday, the 22nd day of December, 1879 at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 8, No. 220 Sansome St., San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock of the Butte Hydraulic Mining Company is postponed to the Fifth day of January, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock is postponed to the second day of February, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

San Francisco, Cal., January 8d, 1879.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the 24th day of December, 1879, an assessment (No. 40) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the First day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale

W. O. WILSON, Secretary.

Office—402 Front street, room 6, San Francisco, California.

Mariposa Land and Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 10th day of December, 1879, an assessment (No. 17) of Fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. currency to the Secretary, at the office of the company, room 33, Nevada block, No 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of January, 1880, will be delinquent and advertised for sale at public auction; and unless payment is made before will be sold on the 2d day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. LEANDER LEAVITT, Secretary.

Office—Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, California.

Numa Mining Company.—Location of Prin-

cipal place of business, San Francisco, California. Location of works, Humboldt County, Nevada.

NOTICE.—There is delinquent upon the following described stock on account of assessment (No. 2) levied on the 23d day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Alexander, E W	43	2000	$40 00
Blasdel, E W	15	250	5 00
Blasdel, E W	16	250	5 00
Blasdel, E W, Trustee	27	500	10 00
Blasdel, E W, Trustee	28	500	10 00
Blasdel, E W, Trustee	30	500	10 00
Blasdel, E W, Trustee	31	500	10 00
Blasdel, E W, Trustee	45	250	5 00
Blasdel, E W, Trustee	46	250	5 00
Blasdel, E W, Trustee	47	500	10 00
Blasdel, E W, Trustee	49	500	10 00
Blasdel, E W, Trustee	50	2500	50 00
Blasdel, E W, Trustee	51	4000	80 00
Blasdel, E W, Trustee	64	250	5 00
Brown, George A	42	500	10 00
Burns, A M	28	7500	150 00
Burns, A M	55	500	10 00
Burns, A M, Trustee	56	2500	50 00
McKusick, H J	44	4000	80 00
Merry, D B	65	500	10 00

And in accordance with law and an order of the Board of Directors, made on the 19th day of Novcuber, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 328 Montgomery street, room 21, San Francisco, California, on Monday, the Twelfth day of January, 1880, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale

DAVID WILDER, Secretary.

Office—328 Montgomery St., room 21, San Francisco, California.

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THOMAS MAGUIRE ..... Manager.
CHAS. H. GOODWIN ..... Treasurer.
J. P. CHAPMAN ..... Assistant Treasurer.

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Repairing promptly attended to at the lowest possible terms.

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Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

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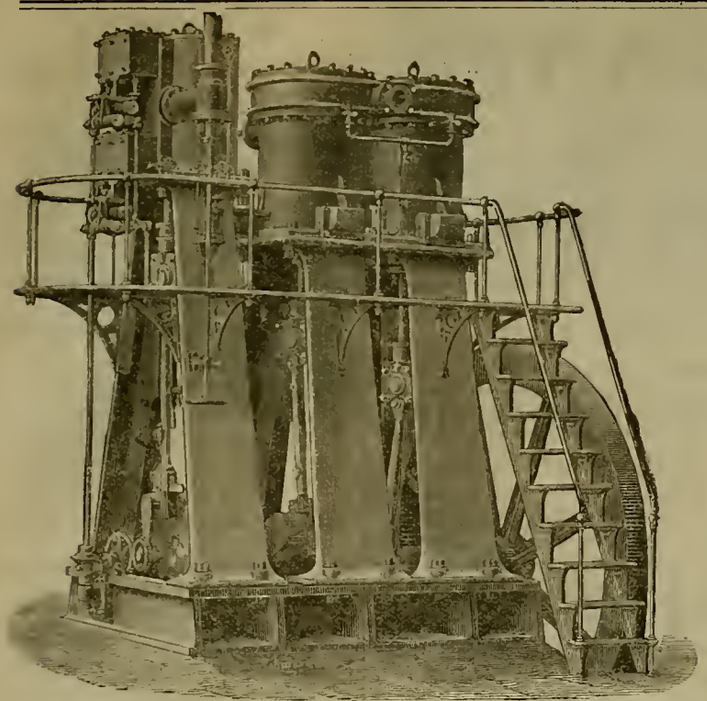

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Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

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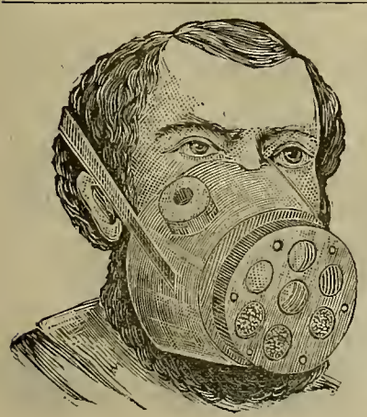

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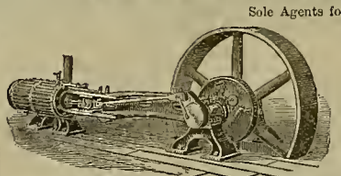

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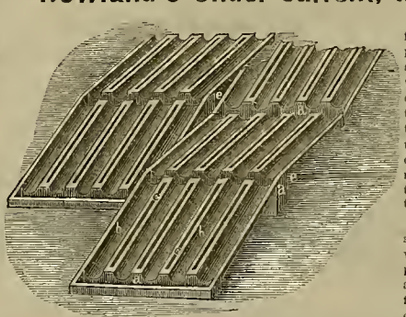

This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

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The Regular Annual meeting of the GILA SILVER MINING COMPANY will be held at the office of the Company, room 7, Safe Deposit Building, 328 Montgomery St., San Francisco, California, on Monday, the Twelfth day of January, 1880, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors to serve during the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Monday, the Fifth of January, 1880, at 12 o'clock M.

WM. W. PARRISH, Secretary.

Office—Room 7, Safe Deposit Building, No. 328 Montgomery street, San Francisco, California.

Information Wanted

Of Daniel McCall, born in Co. Cavan, Ireland, by his twin brother, HUGH MCCALL, 177 Hudson St., Canton, Baltimore, Md.

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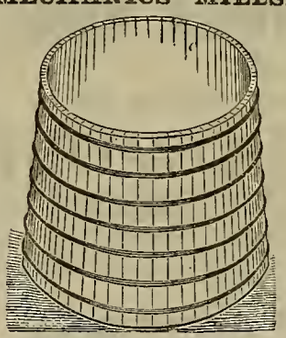

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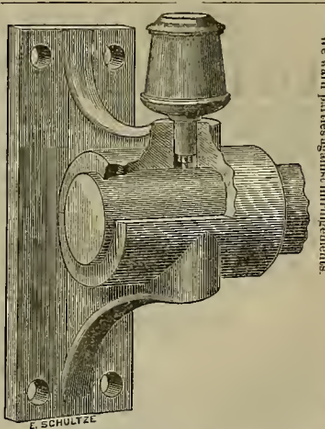

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SAN FRANCISCO, SATURDAY, JANUARY 17, 1880.

VOLUME XL Number 3.

Evans' Amalgamating Riffle.

A New Device for Saving Fine Gold and Sulphurets.

In 1868 Georgs R. Evans, a miner of many years experience, invented and patented a gold-saving apparatus which was known ae "Evane' Corrugatcd Riffle and Undercnrrent Sluics," the merit of which brought it into nse in many placee with good eucceee. In following up his experimente in thie direction, he had an excellent opportunity to etudy the effecte of ths concentrating action of peculiarly obstructed currents of water, and to improve hie original idea; having all the time ths object in viaw which has eludcd eo many inventors, thet ie, eaving all the finest particlee of precioue metale, concentrating and catchiug ths eulphurete, and, equally important, prsventing lose of quicksilver.

The experience of thees yeare is embodied in an improved riffle constructed on practicel principlee and for which suitahls etepe have been taken to securs letters patent.

The accompanying engraving will give an idea of ths general appearance of the apparatus, as arranged to connect with the battery of a quartz mill. By ueing suitable screene, the riffles may of couree he ueed in placer mining or in any work where precioue metals ars to he eaved.

All minere understand well enough that ths battery and plate amalgamation of quartz mille ie hy no meane perfect, and that coneiderahle loee of quicksilver and fine gold occure. Ths ordinary flat inclined amalgamating plates are defective in this respect, that through ths gravity of the quicksilver with which they ars charged, accelerated hy ths downward current of water and pulp, and ths jarring of the etamps, more or leee amalgam is detached from ths plates and peeces off. The finest of ths particlee of gold, which will float on ths eurface of ths current of ths water never reach ths plate at all, eo do not coms in contact with the mercury. Then the material passee over inclined blanket slnicss, flat like ths plates, eo that ths hlanket threade will catch the eulphurete and any fine floating particles of gold which have eecaped ths plates. The effectivenese of the hlankete ie in a great measurs neutralized hy ths nap of the hlankete heing flattened hy ths current. It is not only in quartz mining theee losses occur, hut in placer and hydraulic work ths fine gold paeses off with the tailinge, and efforte to save the sulphurete or platinum havs hesn ahandoned as futils.

It is theee difficultiee which the Evane' riffle ie designed to overcoms. Ths peculiar feature of thees riffles is ths undulating eurfacs over which the water and material under treatment flows, and the curioue and effective action dus to the form, by which a euccession of dead-water eddiee occur in the current; thees eddise forming at ths loweet pointe and in ench a poeition as to retard and etay the onward progree of paeeing particlee of gold, amalgam or mercury.

Ths eeries of amalgamating riffles ars of any width and any numhsr or length, of an undulating surface, mads hy the union of alternats reverse curves of ehallow dspth, so that when the current flowe over the ridgee it will pass down into ths hollows and creats a sort of rolling movsment or eddy, hy which thesand, gold, etc., ars rolled over and ovsr and brought into contact with the amalgamating surface. This action, aleo, to a certain extent ecours or brightene any "ruety" or coatsd gold so that it will mors readily amalgamate. In paeeing on to the surface of ths platee the current paseee over ths ridge into the hollow or concavs, where it hreake and forms a riffle or wave, with a very effective and peculiar reflex action. Ths material which ths current carriee, ie, at this point, brought hy ths roiling motion of the water—the eddy or wave—into contact with ths platse and any fine gold or floured quickeilver ie caught.

The lighter material ie then carried on over to the opposite slops, and ths current, again flowing smoothly in ite normal condition, carriee ths material over the euceeeding ridge into the next depreeeion, where the operation is rspeated, and eo on down to the end.

Thsre ie not the chancs for ths loes of quicksilvsr ae in flat platse, eince each depreseion servee as a receptacle, from which, in ordsr to escape it muet, in the firet place, move out of tho dead water againet the rcflex wave or riffle, and muet also travol up an incline, noither of which can it very readily do.

Thie "riffls" is eomewhat different from what ie implied in the ordinary acceptation of the tsrm. It ie not a rigid traneveree bar or obstruction, ahovs the enrface, designed to intercept ths onward progrsse of flowing material. It is a water riffle, an elastic check, in constant and ceaselees motion, hut more effective in retarding the progress of the precioue particlee. Ths current ie not suddenly checked, and the water agitated hy a rigid obetruction, tending to activcly dieturh the molsculee, hut the wave forme naturally, and a water riffle ie the consequence. Thie water riffle, hy ite constant ehaking and agitation, hae a concentrating action, similar to that brought ahout hy ehaking a pan back and forth, hy which the lighter worthleee particlee are eeparated and allowed to flow off, whils the heavier precioue particles are retained under and within it. The material is not stopped *above* the riffle, hut *in* it, and oncs etopped, is held *under* it. The shaking of the water riffle, caueed hy ite particlee heing conetantly changed ae new onee coms and ths othere paee on, hae the effect of preventing packing of ths heavy material undsr the riffle in the hollow where it forms, eo a continual concentration eneuee, the gold and quicksilver heing shaken down to the amalgamatsd surface hslow any hlack eand.

It will hs seen that no euch action ae thie ie poeeihle in a rigid traneveree riffls formed of wood or copper. In the first placs the material cannot get under euch a riffle, which, moreover, is liahls to let ths eand pack above it; and there is no concsntrating action at all. Ths wave riffle cannot he formed on a plans eurface without the ues of rigid traneverss hare, hut forms naturally in ths undulating surfacs deecribed.

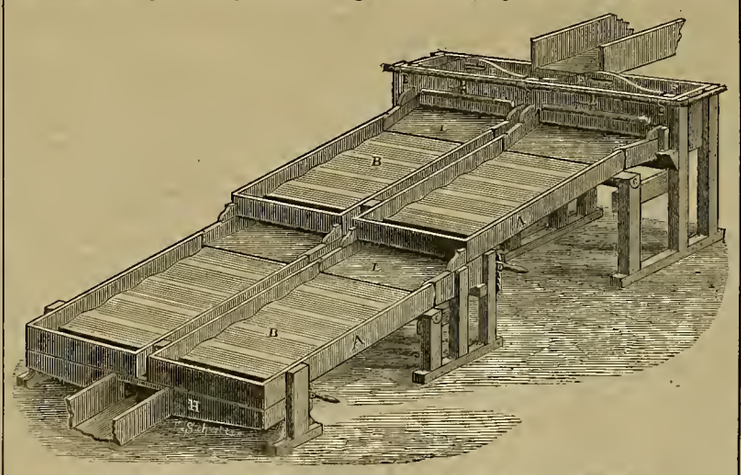
For attaching to the hatteriee of quartz mills, the undulating riffiee, *B*, are placed in a suitahle frame, *A*, at the head of which is a distrihuting box, *F*, this hox receiving its supply of material from a central source and extsnding across the upper or amalgamating series of riffiee. The hottom of eaid hox is deeper than the inclined plate at the head of ths firet riffls, to ineure an even overflow of the material. This hox is provided with a epreader eo ae to dietribute ths material received through the openinge along the eaid box. Ths hox is aleo provided with gatee, *E*, eo that the matsrial can he gauged to any deeirahle quantity over the amalgamating rifflee. A ehort inclined plane, *L*, allowe the current to flow with an even surface into the firet depreseion.

The plates ars arranged in ehort douhls eections with a drop hstween ths pairs, as ehown; it heing found that they work hetter in ehort than in long eections. At the lower snd of the lower eection is a trough, *H*, into which ths waets matsriale fall. Thie trough tapere or conversges to a common centsr, eo that ths whole of the refnes and water can he conveysd to any desired point. Thie trough, however, is usually eet helow ths hlanket eectione. Anothsr eeriee of riffles of the eame undulating eurface as deecribed, ie set below the lowest eection of amalgamating platee; hut thie eeriee is lined on ths eurfacs with a hlanket for concentrating and saving eulphurete, platinum, etc. The peculiar action of ths current in forming a revolving eddy, as deecribed in ths amalgamating eeriee, caueee the nap of the hlankete affected by thie action to attain an upright position, thue preeenting to the precioue particles a more eecure lodgment. The elastic water riffle is here again formed in the hollows or depreeeions, ths concentrating action of which is very effectivs to eave the sulphurete.

The angle of inclination of any of the eeriee of rifflee may be regulatsd hy ths levers, *D*, ths upper end of each eeparats eeriee reeting on a rocking bar, *C*, as shown. The inclins of the riffle eections ie thue regulated to euit the clase of material treated, or ths amount of water aveilahls. A great deal of water with a elight incline, or considerahls incline with littls water, may hs used. Thie ie especially useful in clcaning up, ae any miner will eee.

When it is deeirsd to clean up any one of ths rifflee ite gate, *E*, will hs oloeed, and ths water may he turned into ths head of ths riffls from ths perforated pipe, *I*, eo that clear water is paseed on to the platee.

In cleaning up the hlanket sections, clear



EVANS' AMALGAMATING AND CONCENTRATING RIFFLE.

water ie allowed to run on, and ths sulphurste, etc., may he ewept down with a hroom into the trough, *H*, and thsnce into a tank.

To maks the rifflee in ths shape shown, wooden forme are firet prepared, and upon them ars placsd silver-plated amalgamated platss, all so arranged in the hoxes, *A*, that no leakage can occur.

A eet of theee wave-line platee and blankst eluicee hae hesn est up for uss in ths haesmsnt of No. 416 Clay etreet, for eeveral weeke past, whers thsy havs heen tseted and examined hy numhers of mining men and experts. Ths operation can thers bs clsarly seen, and it ie very intsresting to watch ths curioue action of the elaetic water riffle in concentrating ths material and hiding ths valuahle portions within itsslf. S. P. Taylor and Alexander Lewthwaite ars intsrseted in the apparatue with George R. Evans, the inventor, and either of thsm will he pleaeed to ehow it at work to any mining msn dsirons of examining it.

THE Mayor of San Francieco hae recsived a diepatch from ths Lord Mayor of London, asking aid for an international teetimonial to ths memory of Sir Rowland Hill, ths author of ths penny poetags system.

THE Legielature of Arizona has organized—Council, four Dsmocrate and nins Republicans; Houss, thirteen Dsmocrats and thirtesn Republicane.

HON. L. Q. C. LAMAR, U. S. Senator from Miseissippi, is suffering from a stroke of paralysis.

The San Francisco Copper Mining Company's Mine and Reduction Works.

The San Francieco Copper Mining Company and Reduction Works ie eituated in Nevada county at the altitude of about 400 feet abovs ths lsvel of ths eea. An ahundancs of timher is in close proximity to the mine, and water pewer can he had for sevsn monthe in ths year fres of charge, and afterwarde from ditchee in the neighberhood.

The mine is 12 milee from Wheatland on a branch of the C. P. R. R. and a good road leads from there to the mine. Wheatland ie 140 miles from San Francisco; heeidee, ths mine is 18 miles from a navigahls point on the Feather river.

The company hold 3,000 feet on the vein, and two mill-eitee covered hy United Statee patent. The vein is almost vertical with a elight inclination towards the eaet, and its coures is nearly northwest and eoutheaet, and is imbedded in a crystalline elate on ths west, and granits on ths eaet.

A ehaft has been eunk on the east wall to the dspth of 150 feet through a solid hody of ors. At the depth of 60 feet the firet croeecut to ths west developed a eolid vein of mundic ore 75 feet in width, undieturhed by any fault; ths ore on thie levsl averaged 7%.

At 100 feet another croeecut wae run to ths wset, and ths vein proved the eams in width. From thie level the reduction worke are at preeent eupplied with ore, and the averags of the eams hae improved to 9%.

The roasting of the ors ie done in open pilee, from 1,000 to 1,200 tons hurning four to eix months.

The leaching of the eulphate formed in roasting is performed in wooden tanks, from thess the solution is traneferred to rseervoirs to eettls, and afterwards pumped into rsvolving cylinders.

The precipitation ie affected hy meane of ecrap iron, aud after two or three tone of precipitate of copper has accumulated in each cylinder, ths eame ie discharged, filtered and traneferred to a drying pan, which ie heated hy the exhauet eteam of ths engine.

After drying the precipitate or cement copper, it ie ready for market and aesaye hetween 85% and 90% fins.

From 40% to 50% of the copper ohtained ie extracted from ths ors immediately, and ths halancs is gradually ohtained from tho dump pile, whers the ore spontaneously decompoeee.

Amount of coppsr ore manipulatsd and cemsnt coppsr produced from January 1, 1879, to January 1, 1880, ieae follows: Ors manipulated, 6,000 tone; cement copper produced, 512,128 pounds. Thers is at preesnt 15,000 tons of ors roasting, and the works havs a capacity to work 60 tone daily.

During ths laet four years 17,000 tons of waets ore havs accumulated on ths dump pile, which still containe a produot of 64% of red oxids of iron, and ths quality ohtained from sams hy crucihls emelting hae heen equal to the hest of white iron.

Sulphuric acid could he mannfacturad at a nominal cost of three-quarter cent per pound from ths fumes of 15,000 tons of ore waeting themeelves in the air.

Ths company during the year 1880 will be prepared to supply any rolling mill which may he etarted with oopper at Eastern pricee, and the amount of ors at preeent in eight, eubject to competent inspection, will fully warrant ths expenditurs needed in the conetruction of ths rolling mill.

Ths eituation and reeources of thie mins, and immense hody of ors now in sight, maks thie a property of great valus. It requiree only ths proper applicatione to work up the differcnt metale and acids which ths ors contains.

THE Stats Lsgislature of Missiesippi ars endeavoring to slect a U. S. Senator to eucceed Bruce, the colored membsr from that State.

THE father of Prof. Richards, of Yale College, wae killed Friday laet at Stamford, Conn., by a railroad train.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Globe District, Arizona.

Editors Press:—Here I am at Globe again, after a three weeks' absence, and I find during that time there has been a marked improvement; several new strikes and a better and livelier feeling throughout, which has started work that for a long time has been shut down. Advices have been received that the machinery for the Mexican and Nugget mill has been delivered at the terminus of the railroad. Teams have been dispatched, and by the time that is hauled they will have to return for the Irene mill. The grading of roads and mill sites, together with the developing of the respective properties, make employment for nearly all who wish to work. The rebuilding of the Miami is nearly finished, as also the remodeling of the Champion, so that in a short time our capacity will be increased from 5 to 50 stamps.

I have, since my return, visited several of the new strikes, and I found that at the Irene the shaft, at 90 feet, was in solid ore of a high grade. The indications are that the ore body now is considerably wider than the shaft. This shaft was sunk for an air shaft, which will be connected with a tunnel now being driven in to tap the vein nearly 250 feet deep.

At the Buffalo and Mark Twain, I found the shaft had cut through the iron and copper capping, and that silver was predominating. This is one of our strong veins which was capped to the depth of about 40 feet with base metal; this having been gone through, it is now developing into a fine property.

The Alice and Alice Southwest lie to the south of the Buffalo and Mark Twain. One has been prospected to the depth of 175 feet, the other 100 feet; both show ore bodies of a high grade, and enough to warrant the building of a mill.

Report comes that some rich strikes have been made in the gold belt, which I will try and visit before my next. This belt is situated about six miles northwest of Globe, and has some fine prospects, among which is the Golden Eagle, recently purchased by Eastern men. The ore averages from $35 to $65 per ton, free gold. Twenty-eight tons taken from the Eagle returned $1,476.45. These parties have bonded seven other prospects in the same belt, and the building of a gold mill will soon take place.

Eastern men are about the only ones who are doing anything here, and all who have visited this district are well pleased with the present showing. I am satisfied that this district will soon have several good-producing and dividend-paying mines. Miner.

Mining in San Bernardino County.

Ivanpah Mining Camp.

Editors Press:—In the first place allow me to congratulate you on the great advance you have made in your paper the past four years, especially as to the mining interests. I am glad to see that you have steered reasonably clear of the scientific gulf. The average miner and prospector cannot understand a too scientific paper, and besides they wish a more practical knowledge of things in general. I and many others have noticed with pleasure the stand you are taking regarding, among other things, the development of the copper interests on the Pacific slope.

Clarke Mining District.

Better known as Ivanpah mining camp, is within about 12 miles of the State of Nevada, and about 200 miles from San Bernardino, where they get their supplies from. This camp has been worked continuously since 1870, considerable money having been taken out of various mines, notably, that of the McFarland Brothers, now incorporated as the Ivanpah Con. Mill and Mining Co. of San Francisco. There are two mills here, one belonging to the last named company, and one owned by J. A. Bidwell.

The district and the surrounding country is composed of a large number of silver ledges, principally worked by chloriders. Since the incorporation of the

Ivanpah Con. Mill and Mining Co.,

With W. O. McFarland as its Superintendent, the camp has been given quite an impetus. The mill is being thoroughly overhauled, and the mines are being opened up in a more practical manner. The company has the best defined ledges in limestone that your correspondent has ever seen. The claims had been worked formerly by the McFarland Brothers, who took out a large amount of money. I might call it only surface working, as the deepest shaft is about 200 feet. I was accorded the privilege by the Superintendent of examining the old works, and was greatly surprised to find so well a defined lode, work having been done for over 2,500 feet in length, showing a large number of chutes of ore.

In one of the tunnels the ore chute is over 300 feet in length, the vein being small but very rich. There are some two or three men stoping on this ore chute. They are also sinking two shafts, one about the center of their claims, which is down about 135 feet, showing rich ore at the bottom of the shaft. I was shown the return of the workings of the ore from this shaft. The first-class ore worked $1,110, and the second $340.50. The other shaft is being sunk 150 feet lower down to the west, showing the same well-defined ledge. I understand that it is the intention of the company to sink this shaft at least 250 feet more. I think there can be no doubt of the permanency and paying qualities of these mines.

There are a number of other mines in this district paying the owners a handsome profit. The Alley mine, about one-quarter of a mile to the northeast of the Ivanpah Con., has shipped quite a quantity of ore to your city, averaging about $1,500 per ton, the second-class being worked here. One great drawback to the camp heretofore was the excessive price of milling; the charges being $50 per ton, 5% shrinkage and 80% of proceeds of bullion.

About eight miles south of here quite a number of rich strikes have lately been made, assaying from $150 to $5,000.

Gold has also been found about two miles from the Ivanpah Con. mines. A number of locations have been made and work commenced but they are not sufficiently developed to be able to judge whether they will pay. I have seen some very rich specimens taken out during the week.

The wages of the camp for good miners are $4 per day. Board $8 and $9 per week.

It would appear to me, that the San Francisco papers have somehow overlooked the mining interests of this county. This is a splendid mineral-bearing range of mountains and only lacks the capital to make itself agreeably known. I will drop you a line about the surrounding country shortly. J. B.

The Mono County Mineral Belt.

Editors Press:—After spending 10 months in an examination of the mineral belt from Laurel district on the south to Tioga district on the north, I am fully satisfied that the wealth and importance of this new mineral belt will soon attract great attention. This belt is some 50 miles in length, with an average width of about four miles. It is situated on the eastern slope of the Sierra Nevada range, in Mono county, Cal., the course of the belt lying northwest by southeast. The veins are wide, and though the assays are low on the surface, they increase in value as depth is obtained.

The names of the districts lying along this belt are, Laurel district on the southern end, Lake, Prescott, Tioga, Homer, North Fork and Castle Peak. The mines of

Lake District

Are opened to the greatest depth. Mammoth company have opened their ore body at a vertical depth of 600 feet. At this depth 20 feet of ore nearest to footwall mills $40 per ton, the remaining 37 feet milling about $12. They have already completed a 40-stamp mill. Everything is being placed in good order, and shortly the owners will receive handsome dividends. This mine is rightly named; it is indeed a Mammoth.

The True Blue company, south of Mammoth, are opening their ore bodies by tunnels from the east side of Mineral hill. One tunnel completed 350 feet has penetrated the vein, and is now in ore about 40 feet, mostly low grade, but increasing in value as the footwall is approached. This mine has two veins crossing the property, the east vein being now opened by tunnel, while the west vein is opened by means of a shaft on the mountain. The True Blue company have purchased 80 acres of land at the base of the mountain for mills which will be erected the coming spring.

Headlight and Monte Cristo are opening their ore bodies by a joint tunnel on the western slope of Mineral hill, which will be completed some time in May. A shaft has been sunk 150 feet in the mountain on the vein, showing a true fissure vein, 13 feet in width carrying good ore.

Don Quixote, adjoining True Blue, is also being opened by a tunnel from the slope with flattering prospects.

Metallic Con., on the south, have a fine property if developed, the ores showing much fine gold.

Lake Vein company have promising mines, but not yet developed sufficiently to show their true worth.

Silveropolis, Crescent, Last Glimmer and others are preparing for active operations in the spring.

The Pioneer company have a most excellent property, but little worked as yet.

Three towns lie around the base of the mountain—Mineral City, Mammoth City and Pine City. Mammoth is the principal town, having a population of about 1,500, and is the base of supplies for a large region of country. The surrounding country is well timbered and water is found in greatest abundance.

The next important districts are

Tioga and Homer

Situated directly west of Mono lake, at a distance of twelve miles. The mines of these districts are rich in precious metals. There are two distinct mineral-bearing belts running parallel with each other—the eastern belt carrying gold, the western silver and the baser metals.

The west zone or belt passes on the western side of Mt. Dana, showing one large, strong fissure vein. I measured width of Golden Crown location and found some 200 feet, between walls, filled with ore strata. Ore taken near the surface gave assays of from $30 to $200 per ton. These mines may be reached with facility by means of a road from Yosemite valley; distance twenty-five miles. There is an abundance of wood and water at the mines.

The coming summer will change this region from a solitude to a scene of bustling activity. Thousands of miners will congregate here, mills will be erected, and the noise of stamps heard.

The Wealth Enclosed in these Mountains Must be brought forth; cities will spring up along this whole mineral belt, from Bodie on the north to Mammoth on the south. Two toll roads are now building which will open these mines from the west—one commencing at Fresno Flat, running to Mammoth City; distance fifty-two miles; the other from Sonora to Tioga, following the Tuolumne river; distance sixty miles. This mineral belt has for its base on the west solid granite, on the east porphyry and slate. Between these different formations rest the lodes or ore channels of quartz gangue, constituting what are known as contact veins, and furnishing unmistakable evidence of permanency. The belt lies west of the volcanic region about ten miles, and follows the older granite which lies west. The volcanic eruptions have spent their greatest force near Mono lake. The whole region is one vast bed of ashes and lava, with huge mountains of basaltic rock. The mineral lies west of this disturbed section in a more permanent formation. Nearest the volcanic region lies the gold belt, then the silver and base belt; gold on the eastern, silver on the western slope of the mountain.

The belt most permanent is the silver, the gold appearing to be much scattered and in pockets, with the formation broken on the surface. The silver belt is permanent, shows but little disturbance, and is the most reliable. The expense of a trip from San Francisco to these mines in the summer is $15 by S. P. R. R. to Madera, thence by stage and saddle train, two days being consumed in making the trip.

A. Caldwell.

The Hofmann Process.

Editors Press:—In a recent issue I find an article on an alleged new process of treating silver-bearing gold sulphurets, by Mr. Hofmann, consisting of an application of the Patera preceding the Plattner process, with salt roasting, as introduced by me at the Eureka mine, Grass Valley, in 1865.

Having experimented on several occasions since 1876, with this modification of the usual method of Plattner before Patera, which modification at this late date aspires to the dignity of a new process, I can say, that in my hands both methods gave equally as good, or in other cases, as *poor* results on such argentiferous gold ores as I treated, with the advantage in favor of the Plattner-Patera against the Patera-Plattner method on account of greater simplicity of the former.

Great care, however, must be taken when the Plattner precedes the Patera, to collect *all the gold of the solution*, especially when the ore carries copper.

I would call Mr. Hofmann's attention to several piles of sulphuret tailings in this State, assaying from $12 to $18 per ton in gold, the ore having been previously treated for silver by the Patera, from which scarcely a *trace* of gold can be extracted by following it with the Plattner process. G. F. Deetken.

The Locomotive.—A correspondent of the *American Machinist* writes: Thirty years ago it required 1,800 days' labor to construct a locomotive; now it will not exceed 1,500, and a far superior machine in every respect. There are 16,000 locomotives in the United States, and there are over 2,800 different pieces in each, all of which will have to be renewed every 10 or 12 years. Locomotives that retain their identity 20 years or more, as claimed by some roads, are something like the boy's jack-knife which he had 10 years, but it had 9 new handles and 13 new blades. The present capacity of all the shops is not far from 1,700 locomotives per year, and the different roads build in their own repair shops about 100 more, making 1,800 a year in all. Now, allowing 15 years as the average life of an engine, you will see that the shops can build 27,000 in the meantime, showing that the present capacity of our locomotive shops need not be extended for a long time to come.

Electrotyping Applied in Making Statues.—The practical problem of reproducing a large clay model in bronze by the electrotyping process instead of casting, has at last been successfully accomplished in Belgium. The papers report that the Electro-Metallurgical Company, of Brussels, has completed a colossal statue in bronze of Jan Van Eyck (the great ancient painter who invented the art of painting in oil colors), by the system of electro-deposition. The galvanic process occupied several months, although a thickness of but six to eight millimeters (about one-third of an inch) was attained. It is the largest article which has been produced by this method, being over 12 feet in hight, and is necessarily a much more perfect imitation of the model than could be obtained by casting.

Cause of the Decline in Silver.

The value of silver bullion is an item of no inconsiderable regard when the product of the silver mines of the Pacific slope is taken into estimation. The gross weight of the silver yield when divided into ounces, the standard of weight for the market quotations, is so great in numbers that the variation, either of advance or depreciation of a fraction of a cent in the ounce price, produces a marked change in the profits of the mines. Owing to a combination of causes, silver depreciated in the London market from 1874 to 1877 from 59d to 47¾d, being a decline of nearly 20%. So great a decline was sure to produce an injurious effect, by reducing the profits on one of our most prominent industries to that extent. It was a depreciation of from $1.29 to $1.04 in bar silver. It was unlooked for. It was an anomaly in silver transactions. It retarded our mining interests to the extent that it reduced the profits on the outcome of the mines. It was as much of a loss to the nation as if that amount of silver had been destroyed or annihilated. It could not be regained—the loss was total.

When the storm has passed by, the ruin that it has caused has to be estimated, and the subject is studied with a view to guard against future losses from the same cause. It is well, therefore, to investigate these causes and to throw such light upon the subject as will enable us to meet another storm, if it should come, with less loss to ourselves.

The bankers of Europe have always maintained a preference for gold over silver. It is less cumbersome to transport. It can be more speedily counted. It occupies less space in the vaults. So long as public attention was not awakened to the matter, or public interest plainly affected, it was an easy thing for the financiers of Europe to quietly disburse their cumbersome silver and absorb the gold in its stead. This they continued to do until the plenitude of silver and the scarcity of gold called direct notice to the manipulation they were conducting. But this attention was awakened when the storm was raging, and it was then too late to stay its ravages.

At this juncture they, the capitalists of Europe, influenced the governments there to demonetize silver. In doing this they violated one of the great natural laws of finance, and produced a grievous evil by such violation. It disturbed the current of trade. It produced panic and distress. It destroyed confidence, and brought about an enormous shrinkage of values.

Our civil war produced a cotton famine in Europe. While this existed, India absorbed all the surplus silver which was sent there to pay for her cotton. The price of cotton and its fabrics rose to an unprecedented figure, and called for corresponding shipments of silver to southern Asia for the raw material. Gold coinage is unknown in India. Silver is her only coinage. She uses in ordinary times over sixty millions of dollars in silver to maintain her coinage, ornaments and the various uses to which silver is applied; also to compensate for the hoarding of it, such as always takes place among semi-barbarous people, and where there are no public depositories for its safe keeping. She is now sending back to Europe gold in payment of her needed supplies, having sent back all the silver she could command.

Germany, Holland, Sweden and Norway came into the market with their demonetized coin as sellers, instead of as before being purchasers. Our own mines were producing an enormous yield, and greatly exaggerated tales were circulated as to their future product. Our own Government followed in the blind track of the Europeans and demonetized silver. Instead of fostering our silver mining industry, it aided in its depression.

This combination of adverse causes, all acting in direct antagonism to the value of silver, produced its marked decline.

The reaction commenced when our Government made its partial restoration of silver to its true position as a standard or measure of value. The amount of silver coin accumulated in the Government vaults has somewhat of a tendency to restore silver to its former price. The return of confidence in commercial circles will call for its use in circulation. India will ere long commence a reabsorption. The financial storm has past. We have shown its causes. The avoidance of its recurrence will be to abstain from the violation of the natural law of finance, which has been exemplified by the experience of ages, that silver is a natural and necessary standard of value in connection with gold, and that to demonetize it, is to violate that natural law and to create an evil instead of producing a benefit.

An Iron Enterprise in Utah.—The Norway Iron and Manufacturing Company of Utah, having its principal office at Salt Lake City, has been incorporated "for the purpose of mining, smelting, milling and manufacturing metals of iron, gold and silver, and manufacturing pig iron, mineral paints and other articles of merchantable iron." The officers are John T. Lynch, President; Charles Popper, Vice-President; Frederick G. Lynberg, Treasurer; B. A. M. Froiseth, Secretary. These gentlemen, together with J. R. McBride, John Beers and Syvert Iverson, constitute the Board of Directors. The whole of the stock, $1,000,000, is paid up.

MECHANICAL PROGRESS.

Heating Steel in the Blacksmith's Fire.

In heating steel, two faults are especially to be guarded against. First, overheating; secondly, unequal heating of the parts to be operated on (whether by forging or tempering). Referring to the first, many blacksmiths do not recognize that steel is burned unless it falls to pieces under the hammer blows, whereas that condition is only an advanced stage of the condition designated as *burnt*. This is the secret of their partial failure, or, that is to say, of the inferiority of their work. Others recognize that from the time a piece of steel is *overheated*, to its arrival at the stage commonly recognized as *burnt*, a constant deterioration is taking place.

In the practice of some, this excessive heating may be carried to so small a degree as not to be discernible, except the tool be placed in the hands of an operator whose superior knowledge or skill enables him to put it to a maximum of duty, less skillful manipulators being satisfied with a less amount of duty.

But in the case of stone-cutting tools especially, and of iron-cutting tools when placed in the hands of very rapid and expert workmen, the least overheating of the tool will diminish its cutting value as well as its endurance. A piece of steel that is burnt sufficiently to break under the forging hammer, or to be as weak as cast iron, will show, on fracture, a coarse, sparkling, granulated structure, and this is the test by which working mechanics, generally, judge whether steel is burned or not. But it is totally inadequate as a test to determine whether the steel has not suffered to some extent from overheating. Indeed, although the grain becomes granulated and coarse in proportion as it is overheated, yet it may be so little overheated as to make no visible difference in the grain of the fracture, although very plainly perceptible in the working of the tool, if placed in the hands of a thoroughly good workman.

When the results attained are inferior, it is usual to place the blame on the steel, but in the case of well-known brands of steel, the fault lies, in ninety-nine cases in a hundred, in overheating, either for the forging or for the tempering.

In determining from the duty required of it, whether a tool comes up to the highest standard of excellence, the best practice must be taken as that standard. Thus, if it is a metal-cutting tool, as, say a lathe tool, let the depth of cut be that which will reduce, at one cut, say, a four-inch wrought-iron shaft down to 3¼ inches diameter, the lathe making, say, 16 revolutions, while the tool travels an inch, and making from 25 to 30 revolutions per minute. Under these conditions, which are vastly in excess of the duty usually assigned in books to lathe tools, the tool should carry the cut at least four feet along the shaft without requiring grinding.

If the tool is for stone work, let it be tested by the most expert and expeditious workman. These instructions are necessary because of the great difference in the quantity of the work turned out in the usual way and that turned out by very expert workmen.

At what particular degree of temperature steel begins to suffer from overheating cannot be defined, because it varies with the quality of the steel. The proper degree of heat sufficient to render the steel soft enough to forge properly and not deteriorate in the fire is usually given as a *cherry red*, but this is entirely too vague for successful manipulation, and, in practice, covers a wide range of temperature.

The formation of a scale is a much better test, for when the scales form and fall off of themselves, the steel, in fine grades of cast steel, is overheated, and has suffered to some extent, though the common grades of spring or machine steel may permit sufficient heat to have the scale fall off without the steel being worked. As a rule, the heat for tempering should be less than that for forging, and should not exceed a blood red. There are special kinds of steel, however, as, for example, chrome steel, which require peculiar heating, and in using them strict attention should be paid to all instructions given by the manufacturers.

Steel should be heated for forging as quickly as compatible with securing an even degree of heat all through the part to be forged, and heated as little as possible elsewhere. If this is not done the edges or thin parts become heated first, and the forging blows unduly stretch the hottest parts, while the cooler parts refuse to compress; hence a sort of tearing action takes place instead of the metal moving or stretching uniformly.

The steel should be turned over and over in the fire, and taken frequently from the fire, not only to guard against overheating, but because it will cool the edges and tend to keep the heat uniform.

The fire may be given a full blast until the steel begins to assume redness at the edges or in the thin parts, when the blast must be reduced. If the thin part is heating too rapidly it may be pushed through the fire into the cooler coals or taken out and cooled in the air or in water, but this latter should be avoided as much as possible.

When the steel is properly heated, it should be forged as quickly as possible. Every second of time is of the utmost importance.

There must be no hesitation or examining while the steel is red-hot, nor should it be hammered after it has lost its redness. There is, it is true, a common impression that by lightly hammering steel while black-hot it becomes impacted, but this only serves to make the steel more brittle, without increasing its hardness when hardened.—*Blacksmith and Wheelwright.*

BLOWERS VS. BELLOWS.—The important question as to whether a blower or a bellows furnishes the best power for forcing air into a blacksmith's fire is not yet settled; and probably never will be, to the satisfaction of everybody. Some blacksmiths advocate the one and some the other, each differing honestly. The American Institute of New York, recently instituted a contest or trial. Two pieces of iron, each 3¾ inches square and 7 inches in length—as nearly alike as possible. These blocks of iron were welded to rods some three feet long. Similar fires were arranged, one urged by the Centennial Hand Fan Blower, and the other by the Hurricane Bellows, each managed by their respective agents. The blocks were plunged into the fires simultaneously. The bellows were run at twenty-five up and down movements of the bellows per minute for 13½ minutes, when the operator said his block had reached a proper welding heat. Both irons were withdrawn at the same moment and it was decided by the judges that, although there was a perceptible difference in the degree of heat attained by each block of iron, still that difference appeared to be of only a trifling character; so that if the reputation of either method of propelling air was dependent upon this test, it would rest on a very slender foundation.

A NEW CASK AND BARREL HOOP.—Advertisements have recently appeared in American journals and a patent has recently been taken out in this country for a barrel hoop made of wire bent into corrugations, so that it has a serpentine form. It is claimed that this hoop, when driven upon a dry barrel or tub, will compress and hold the staves tightly together, like the ordinary hoop, but will have elasticity or spring enough to stretch when the staves expand by moisture, and return to its former position when the staves again contract on becoming dry; in this way the hoops will adapt themselves to the expansion and contraction of the barrel and the annoyance of loose or bursting hoops will be avoided. By forming the corrugations to rest flatwise against the staves, no obstruction is offered to rolling in case of barrels, while a much greater amount of friction surface is brought to bear upon the staves, increasing their holding power. The ends of the wire are secured together by twisting one end around the other. These hoops being made of wire, will withstand corrosion much better than flat hoops, as less metal comes in contact with the wood and less opportunity is afforded for the retention of moisture.

EDGE-LAID BELTS.—According to Leigh, a better method of producing a broad belt than the usual American double leather belting sewed together—a method by which the article can be made with the greatest ease, of any thickness or width, perfectly equal in texture throughout, and alike on both sides—consists in cutting up the hides into strips the width of the intended thickness of the belt, and setting them on edge, these strips to have holes punched in them about one-eighth of an inch in diameter and one inch apart; nails, made of round wire, clinched up at one end for a head and flattened at the other, are used for fastening the leather strips together. Each nail is in this case half the width of the intended belt, and after the strips are all built upon the nails, the ends of the latter are turned down and driven into the leather, thus making a firm strap, without any kind of cement, splicing or similar treatment. When a strap made in accordance with this plan requires to be tightened, it is only necessary to take it asunder at the step lines of the splice, cut off from each end of the strap what is required, and piece up again with wire nails or laces, going entirely through the strap.

FLEXIBLE LINING FOR KEROSENE LAMPS.—An ingenious invention has recently been introduced in Maryland to insure safety in the use of kerosene lamps. It consists of a lining made of flexible material, which prevents the lamp becoming foul by the expansion of the material of the lamp, permitting oil to exude and soil the hands, or whatever it may touch. A broken lamp becomes harmless, as there is neither gas from the oil nor oil itself to spread destruction to everything it comes in contact with. Careless handling will not bring the oil in contact with a hot lamp. The lining is a natural receptacle for fluids, a non-conductor of heat, and is improved in several essentials by being filled with oil. It is strong enough to resist rupture from much rougher handling than can be expected from an article designed for this purpose. No change is necessary in lamps now in use. The attachment is made to fit any kerosene lamp. An accommodation coupling, or joint, enables any one to change their lamp from a foul and dangerous light to one perfectly safe, clean and harmless. This lining is probably made of glue and glycerine, a mixture that always remains flexible, and is perfectly oil-proof.

WOOD-CENTERED car wheels, which are used in very large numbers for the passenger cars of English and Continental railways, have been found unequal to the duty enforced upon them by the higher strains due to the use of continuous brakes. Mr. Cleminson, an English engineer, has sought to render them fit for service under existing circumstances by changing both the construction of the nave and the bars. The latter is now made with a number of arms extending to within a short distance of the tire, which do not prevent a close fitting of the wooden segments. He has also improved the ordinary method of tire fastening by having the tire formed with a groove for the retaining ring. The main advantages claimed for wooden-centered wheels are a decreased wear of axle and tire, claims which seem to be borne out by comparative experiments made in French and German woods.

SCIENTIFIC PROGRESS.

Scandium.

Concerning the new element, scandium, of Nilson, M. Cleve has presented a more detailed account before the French Academy, and confirms to have found this element in the *gadolinite* and *yttrotitanite* of Norway in minute quantities. It forms but one oxide—Sc_2O_3. Its atomic weight is 45.12. The oxide is a perfectly white, infusible powder, resembling magnesia. It is more soluble than alumina in acids, yet it is only attacked with difficulty.

The specific gravity of the oxide is approximately 3.8. The hydrate is a white, bulky precipitate, resembling alumina, and is insoluble in excess of ammonia or of caustic potassa. The salts are colorless or white. They have a harsh, astringent taste, different from the sugary flavor of the other yttria earths.

The special interest surrounding the discovery of scandium, M. Cleve further states, is the fact that its existence had been predicted by Mendeleef in his remarkable memoir on the law of periodicity. In this he indicated the existence of a metal, which he named *ekabor*, whose characters, as given below, in brief, agree very closely with those observed of scandium, namely:

MENDELEEF'S PREDICTED CHARACTERS OF EKABOR.	OBSERVED CHARACTERS OF SCANDIUM.
Atomic weight, 44.	Atomic weight, 45.12.
Ekabor should have but one stable oxide Eb_2O_3; more energetic than alumina, but less basic than magnesia.	Only one oxide, Sc_2O_3; much more energetic than alumina, and feebler than magnesia.
A great resemblance between yttria and oxide of ekabor; their separation difficult, and only effected by differences of solubility, etc.	Scandium is less basic than yttria, and their separation depends on the different stability of their nitrates when heated.
With potassium sulphate forms double salt, having the composition of alum, but scarcely isomorphous with that salt.	Scandium and ammonium double salt is anhydrous, but has otherwise the composition of alum.
Few of the salts of ekabor will crystallize well.	The sulphate does not form distinct crystals.
Water will decompose the anhydrous chloride, with liberation of chlorhydric acid.	Water decomposes the chloride and evolves chlorhydric acid when heated.
The oxide will be infusible and with difficulty soluble in acid.	Ignited oxide is infusible, and dissolves with difficulty in acids.
Specific gravity of the oxide will be about 3.5.	Specific gravity of the oxide of scandium is 3.8.

The analogies existing between the predicted and observed characters of the hypothetical ekabor and of scandium are sufficiently remarkable to give another probable case of verification of Mendeleef's hypothesis, to which the attention of chemists was specially attracted by the discovery of gallium, where the predicted and ascertained characters were almost identical.

Mr. Crookes on Radiant Matter.

A few weeks since Mr. William Crookes, F. R. S., gave at the London Institution an experimental demonstration of recent researches on radiant matter. He observed that modern research during the last sixty years had greatly enlarged and modified our views on the constitution of gases, which were now believed to be composed of small particles or molecules that were constantly moving in every direction with velocities of all conceivable magnitudes. As these molecules were exceedingly numerous, it followed that no molecule could move far in any direction without coming in contact with some other molecule; but if we exhausted the air or gas contained in a closed vessel, the number of molecules became diminished, and the distance through which any of them could move without coming in contact with another was increased, the length of the mean free path being inversely proportional to the number of molecules present. The further this process was carried, the longer became the average distance a molecule could travel before entering into collision; or, in other words, the longer its mean free path, the more the physical properties of the gas or air were modified. Thus, at a certain point the phenomena of the radiometer became possible, and on pushing the rarefaction still further—*i. e.*, decreasing the number of molecules in a given space and lengthening their mean free path—the experimental results were obtainable, to which Mr. Crookes called the attention of his audience, and which were fully explained in a lecture delivered by him to the British Association at Sheffield in August last.

So distinct, be remarked, were those phenomena from anything which occurred in air or gas at ordinary tension, that we were led to assume that we were here brought face to face with matter in a fourth state or condition—a condition as far removed from the state of gas as gas was from a liquid. In some of its properties radiant matter was as material as wood or tin, while in other properties it almost assumed the character of radiant energy. We had actually touched the borderland where matter and force seem to merge into each other—the shadowy realm between known and unknown, which for him had always had peculiar temptations. He ventured to think that the greatest scientific problems of the future would find their solution in this borderland, and even beyond; there, it seemed to him, lay ultimate realities, subtle, far-reaching and wonderful.

Hydrogen as a Conductor of Heat.

A very interesting experiment is described as follows: "A very simple method of showing that hydrogen is a better conductor of heat than other gases, which is probably due to its metallic character, is described by Carl von Than. Two strong copper wires, several inches long, are held parallel to each other, but not in contact, by slipping over them two short pieces of glass tube, one an inch from the end, the other in the middle, and filling the tubes with plaster of Paris. The short ends of the wire are bent twice at right angles, so as to be an inch apart at the ends, and are connected by a very fine platinum wire. The wires are kept in a vertical position by clamping the second tube to a retort-holder or other support. The longer ends of the wires are bent apart and attached to the poles of a battery of three or four cells. The wires being insulated from each other, the current passes through the fine platinum wire, heating it red-hot. If a bell-jar of hydrogen be held over it, the wire ceases to glow, because heat is conducted so rapidly away. On bringing it into the air again it begins to glow."

In connection with this we remark, that experiments showing that a platinum wire made red-hot in the air by an electric current, will cool down when placed in an atmosphere of hydrogen, is a very old one; second, that the method above described to make the experiment is objectionable, for the reason that when a bell-jar of hydrogen is brought over the wire, the latter comes first in contact with the mixture of air and hydrogen, always present at the lower edge of an open bell-jar filled with hydrogen, forming an explosive mixture which the red-hot platinum wire may ignite, and soon burns up the hydrogen in the jar, bringing the experiment to a premature end.

A better way, and one that we always used when making this experiment before our classes in physics (some 20 years ago), was to take a wide glass tube, open at both ends, in which were inserted corks, each perforated with two holes, one for the conducting copper wire and one for a short glass tube, for the inlet and outlet of gases; the conducting copper wires were connected interiorly by a spiral of platinum wire, and one of the glass tubes exteriorly attached to a rubber hose, for the supply of gas. When the platinum spiral is made red-hot by the electric current, and hydrogen is introduced through the tube, the red-hot wire may ignite the mixture of hydrogen and air and blow out the corks, therefore we always first introduced carbon-dioxid (carbonic acid) gas, so as to displace the air with its oxygen; when the tube was filled with this gas and the spiral in full glow, the hydrogen was let in, the heat diminished, and the spiral lost its glowing appearance. By the re-admission of the carbon-dioxid it became glowing again.

The experiment may be varied and made more striking by passing through one of the corks two glass tubes, one for hydrogen and one for carbon-dioxid, when the platinum spiral may be made hot and cold in succession by admitting carbonic acid or hydrogen gas alternately.—*Manufacturer and Builder.*

EXPLOSION OF A DIAMOND.—At a recent meeting of the Academy of Natural Sciences of Philadelphia, Prof. Leidy exhibited a black agate sleeve button, which had set in it centrally, raised in a gold setting, a rose diamond, about 7 mm. broad. It had been submitted to him by Mr. Kretzmar, a jeweler, who informed him that the person who wore it was recently leaning with his head upon his hand on a window ledge in the sun, when the diamond exploded audibly, and with sufficient force to drive a fragment into his hand and another into his forehead. On examining the diamond, the fractured surface, following a clearage plane, exhibited apparently the remains of a thin cavity such as is sometimes to be seen in quartz crystals. The fracture also exposed a conspicuous particle of coal. Prof. Leidy thought that the explosion had been due to the sudden expansion of some volatile liquid contained in the cavity, as frequently occurs in cavities in many minerals. Mr. Goldsmith thought it possible that the liquid was carbonic acid, as he was impressed with the idea that diamonds originated from this material in the liquid condition.

A CURIOUS ACOUSTICAL ILLUSION.—M. Plumaudon, of the Puy de Dome observatory, has pointed out a curious acoustical illusion, which some of those who use a pair of telephones in receiving may have observed. With a single telephone held, say, to the right ear, the transmitted voice appears to come from a distance to the right; while with a telephone held to the left ear, it seems to arise from the left of the listener. With a telephone to each ear, if one ear be less sensitive than the other, or if the telephone be held farthest from that ear, the voice shifts to the side of the other ear; and if both ears bear alike and both instruments are equally near their respective ears, the voice apparently proceeds from in front of the observer.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 24.		Week Ending Dec. 31.		Week Ending Jan. 8.		Week Ending Jan. 15	
Alpha	7½	6	9½	8¼	11½	10	11¼	10
Alta	3.20	3.10	3.15	2.95	3.10	2.95	3.05	2¾
Andes	35c	25c	45c	30c	1	45c	80c	60c
Alpa								
Argenta	1.05	95c	1.15	1	1.55	1.30	1½	1.40
Atlantic								
Aurora Tunnel								
Baltimore Con	2¼	1.70	4.10	2.90	6¾	4¼	10½	5¾
Belcher	80c	75c	85c	70c	1	70c	75c	65c
Belmont	9½	7¼	10⅝	10	14¾	10⅝	13⅝	13
Best & Belcher	3.70	2¾	3.70	3¾	5	3.80	5	4.40
Bullion	1.35	1¼	1¼	1¼	1¾	1.35	1.55	1.40
Bechtel	1¼	1.20	1.45	1.30	1.55	1.45	1.60	1½
Belle Isle	8¾	8½	9½	9	9	8½	9	8¾
Bodie	1.45	85c	1⅞	1.60	2.90	1.65	2.80	2.35
Benton	9½	8¾	9¾	9½	9½	9¼	13	9½
Bulwer								
Boyle	50c	40c	60c	....	1	45c	80c	60c
Black Hawk	60c	50c	75c	60c	1	80c	1	75c
Belvidere	50c	30c	45c	40c	50c	35c	50c	40c
Booker	1.30	70c	1½	1.05	1¾	1.45	1¾	1½
Caledonia	3.95	2.70	4.10	3.90	4.40	3.95	4.40	4¼
California	2¾	1¼	1.90	1.70	2.10	1.80	2.05	1.90
Challenge	6¾	6	6	5¾	8	6	9¼	7¾
Chollar	7	6	6¾	6¾	8¼	7¾	8¼	8
Confidence	50c	40c	45c	35c	65c	45c	90c	55c
Con Imperial	3.90	3	4	3¾	5	4	4.60	4¼
Con Virginia	2	1.45	2¾	2.40	4¾	3.15	5¾	3.30
Crown Point								
Con Washoe	20c	10c	15c	10c	20c	10c	20c	10c
Champion			50c		50c	25c		
Concordia								
Dayton								
DeFrees								
Daney	95c	70c	75c	65c	70c	65c	70c	65c
Eureka Con	17	16	16¾	....	16¾	16¾	18	16½
Exchequer	2¾	1¼	3	2¾	3¾	2.90	3.80	3.10
Endowment	65c	60c	60c	40c	45c	35c	50c	45c
Gen Thomas								
Grand Prize	50c	30c			1¾	1.15	1.70	1¼
Gila	15c	5c	10c	....	10c	4	15c	10c
Golden Chariot								
Golden Terra	12	....	12	10	11	10½	10½	9
Goodshaw	10c	5c	....	....	35c	15c	50c	35c
Gould & Curry	4¾	3¾	5¼	4¾	7	5¾	6¾	5¾
Hale & Norcross	6¾	6¼	6¾	....	9¼	6¾	9	8¾
Hillside	1¾	85c	1.40	....	1¾	1.40	2.05	1¾
Highbridge								
Homestake								
Hussey								
Independence	80c	75c	1	....	1¾	1	1.10	75c
Julia	1.80	60c	2	1.55	2.60	1.95	2.55	2¼
Justice	1	60c	1.70	1¼	2.60	1¾	2¼	2¼
Jackson	3¼	....	....	....	3¾	....	3¾	....
Joe Scates								
K K Con	5¾	....	4¾	....	....	....	5	4¾
Kentuck	2¾	2¼	3	2¼	4¼	3.30	4.10	3.30
Kossuth								
Keystone								
Lady Bryan	20c	10c	20c	5c	30c	15c	1.45	40c
Lady Wash	50c	30c	50c	45c	85c	50c	75c	65c
Leopard	10c	5c	15c	....	10c	....	10c	....
Leviathan	30c	20c	45c	30c	40c	30c	40c	30c
Leads	40c	....	....	....	50c	....	60c	60c
Lee								
May Belle					15c	10c	30c	20c
Modoc								
Manhattan	1¼	....	1¼	....	1.50	1¾	2	1¾
Martin White	60c	50c	60c	50c	75c	60c	1.40	45c
McClinton	40c	35c	50c	40c	50c	40c	1	50c
Meadow Valley								
Mexican	17¾	15¾	18	15½	22¼	17¾	21¾	19¾
Mides								
Morning Star							2¾	....
North Con Virginia								
New York	25c	10c	35c	20c	50c	30c	50c	30c
Northern Belle	6¾	6	6¾	....	8	6¾	10¾	9¼
New Coso								
Navajo	25c	20c	25c	....	75c	25c	40c	35c
Occidental	50c	25c	....	60c	1.60	1	2.05	1¾
Ophir	18¾	15¾	20	17	21¾	19¼	21	19¼
Oriental					1	15c	80c	55c
Overman	3.70	2¾	6¾	5¾	8¾	7	9¼	7¾
Pantber								
Phenix								
Phil Sheridan	20c							
Potosi	2.90	2¾	3	2.80	4¼	3	5¾	4
Prospect								
Raymond & Ely	90c	70c	90c	....	1	90c	1	95c
Richer								
Rock Island								
Rye Patch								
Rough & Ready								
Savage	4.80	3.85	6	4.35	7¾	5¾	7¾	6¾
Seg Belcher	12	....	14	11	19	15	23¼	16
Sierra Nevada	22	17	18¼	17	27	18¼	22¾	20¼
Silver Hill	80c	35c	1	70c	1	75c	90c	75c
Silver King	6	5	7	6¼	7¼	7	9	6¾
Silver Prize								
Succor								
Summit	80c	50c	....	....	1¼	....	80c	1¼
Scorpion	2.60	2¼	3	2.60	4.15	2.85	3.30	3.20
Solid Silver	20c	15c	....	....	....	....	....	....
South Bodie	15c	10c	....	....	25c	20c	20c	15c
South Standard								
Star	15c	....	10c	....	10c	....	25c	15c
St. Louis								
Syndicate	1¼	90c	1.40	....	1¼	1¼	1¾	1¼
Tioga Con	1¾	1¼	2.20	2.10	2¾	2¼	3.35	2.15
Tiptop	2	1¾	2	1.90	3	2	4	3¼
Trojan								
Union Con	4¼	2¾	4¼	3⅜	5⅜	4¼	5¼	4¾
Utah	9¼	6	9	8	13¾	9¼	12¾	11¼
Vermont Con								
Ward	1.10	50c	1.05	1	1¼	1	2¼	1.40
Wells-Fargo					10c	....	10c	....
Woodville								
White Cloud								
Yellow Jacket	9¾	6¾	9¼	8¾	12¾	9¾	11¾	10¼

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 9.

65	Alta	4.05@4¼	
25	Alpha	10	
110	Andes	80c	
330	Bullion	4¾	
1035	Belcher	.55@55½	
150	Benton	2.45@2¾	
120	Best & Belcher	13¼@13½	
500	C Dorado	1¾@1.65	
70	Caledonia	1.60@1.65	
75	Challenge	7	
450	Crown Point	3.55@3.60	
165	Chollar	7¼	
725	California	4.30@4.40	
1230	Con Virginia	4¼@4.30	
870	Con Imperial	55c	
200	Confidence	80@85c	
270	Exchequer	3.15@3.10	
1000	Fairfax	70c	
150	Flowery	30@35c	
180	Gould & Curry	5¼@5¾	
520	Golden Gate	2¾@2¾	
140	Hale & Nor	8¼@8¾	
520	Justice	2.10@2	
365	Julia	2.30@2¼	
20	Kentuck	3.30	
1780	L Bryan	40@45c	
350	Leviathan	35@30c	
130	Lady Wash	70@65c	
100	Mackey	10c	
430	Mexican	19¾@19½	
100	New York	35c	
1170	N Bonanza	70@65c	
430	Ophir	19½@19¾	
100	Overman	7¼@7	
75	Occidental	1.60@1¼	
20	Potosi	4	
240	Savage	6¾@6¼	
115	Scorpion	3¾	
285	Silver Hill	80@75c	
75	Sierra Nevada	20½	
15	Seg Belcher	16	
130	Utah	11½	
505	Union Con	4¾@4¾	
120	Ward	1.45@1.40	
100	Yellow Jacket	11@10¾	

AFTERNOON SESSION.

940	Argenta	1.45@1½	
600	Atlas	5c	
300	Addenda	35c	
50	Albion	35c	
100	Bulwer	9¼	
100	Boston	1.35	
100	Belmont	70c	
50	Belvidere	55c	
85	Black Hawk	.65@60c	
145	Belle Isle	1¼@1.55	
200	Booker	50c	
620	Bulwer	12@13	
250	Booker	45c	
620	Bulwer	12@13	
135	Bodie	8¾	
260	Bechtel	1¼@1.60	
150	Belle Isle	1¾	
150	Black Hawk	.85@80c	
600	Belvidere	1	
100	Champion	15c	
50	G Pacific	5	
240	Dudley	.55@56	
730	Day	70@75c	
115	Eureka Con	17¾@18	
2200	Endowment	40@35c	
400	Goodshaw	40c	
110	Golden Terra	10¼	
240	Grand Prize	1¼@1.65	
650	Gila	10c	
400	Hillside	2@1.95	
200	Independence	1.10	
25	Jackson	3¼	
150	M White	1.40@1.50	
930	Mammoth	2.90@2¼	
110	Mono	5¾@6	
1000	May Belle	25c	
200	McClinton	50c	
125	Mt Diablo	16	
125	Manhattan	1¾	
150	Metallic	1.10	
95	Northern Belle	10¼	
560	Noonday	4¼@4.90	
285	N Noonday	3.70@3¾	
250	Navajo	40@35c	
315	Orient	45c@40c	
870	Oriental	55@65c	
815	Paradise	1	
776	Queen Bee	25c@1.00	
440	Syndicate	1¼	
1460	S Bulwer	.75@85c	
100	S Noonday	1.80	
680	Tiptop	3¼@3½	
220	Tioga Con	2¼@2.45	
80	Wales	3@3.05	

Saturday A.M., Jan. 10.

900	Alta	4.05@4.20	
70	Alpha	10¼@10½	
300	Addenda	.60@55c	
225	Argenta	1¼@1.45	
160	Andes	.80@75c	
310	Bullion	4¼	
950	Belcher	70c	
160	Best & Belcher	13¾@13½	
20	Belle Isle	1.55	
30	Benton	2.60	
130	Bulwer	10	
230	Bechtel	1.80@1.85	
20	Bodie	9	
130	Black Hawk	.80@85c	
50	Booker	40c	
75	Belvidere	.80@75c	
215	Boston	1.30@1¼	
90	Caledonia	4.30@4¼	
340	Con Virginia	4.30	
1240	Crown Point	.4@3.85	
200	Chollar	7¼@7⅜	
2150	Con Imperial	70c	
50	Challenge	7	
250	Con Imperial	1.60@1.65	
425	Caledonia	1.65@1.60	
50	C Pacific	5	
100	Champion	15c	
300	Dardanelles	80c	
50	Dechecker	3¼	
50	Eureka Con	17	
150	Flowery	35c	
410	Gould & Curry	5¼@5¾	
900	Gila	5c	
500	Golden Gate	2¼@2.30	
200	Grand Prize	1.30	
300	Goodshaw	40c	
250	H & Norcross	8¼	
320	Hillside	2.05@2	
340	Justice	2.15@2.20	
160	Julia	2.30@2¼	
715	Leviathan	30c	
630	L Wash	70c	
1000	Mackey	10c@5c	
1240	Mexican	20@21¼	
80	Morning Star	2¾	
10	Manhattan	2	
590	Metallic	1@95c	
1120	Mono	7@6¾	
410	Mammoth	2.85	
200	May Belle	2c	
200	McClinton	50c	
210	Mt Diablo	15@15¼	
50	Mono	5	
160	M White	1@1.10	
550	New York	35c	
110	Northern Belle	9¼@9¾	
275	N Bonanza	65c	
300	N Noonday	3.70	
620	Noonday	3.70	
1100	Orient	45c	
80	Ophir	20@19¾	
170	Overman	8¼@8¾	
650	Oriental	55c@60c	
130	Occidental	1.80@1¾	
260	Potosi	4	
70	Raymond & E	95c@1	
200	Rod Mont	1.40	
100	S Bodie	20c	
230	Savage	7	
160	Seg Belcher	20	
1070	Sierra Nevada	21@22	
375	Scorpion	3.30@3.20	
200	Syndicate	1¼	
120	Silver Hill	75c	
215	S Bulwer	.90@85c	
150	S Noonday	1.85	
370	Tiptop	3¼@4	
480	Utah	11@11¼	
2270	Union Con	4.85@5¼	
200	University	20c	
90	Wales	3.05@3	
100	Ward	1¼	
250	Yellow Jacket	11¼@11¾	

Monday A. M., Jan. 12.

130	Alpha	11¼@11¾	
440	Alta	4¼@4⅜	
560	Andes	60c	
320	Bullion	4¼@4.40	
160	Best & Belcher	13¾@13¾	
3290	Belcher	9¼@8¾	
150	Benton	2.60@2.70	
90	Confidence	85@80	
120	California	4.30@4.35	
340	Con Virginia	4.30@4.35	
565	Chollar	8@7¾	
970	Con Imperial	60c	
235	Caledonia	1.70@1.70	
600	C Dorado	1¼@1.70	
90	Crown Point	3.30@4¼	
225	Challenge	2	
150	Dardanelles	85c	
340	Exchequer	3.35@3¼	
450	Fairfax	70c	
500	Flowery	35c	
160	Gould & Curry	5¾@6	
400	Golden Gate	2¼@2.30	
1540	Hale & Nor	8¼@8¾	
435	Justice	2.30@2.40	
285	Julia	2.35@2.40	
10	Kentuck	4	
875	Lady Wash	65c	
300	Leviathan	30@35c	
6335	Lady Bryan	60c@1	
150	Mexican	20@21	
100	Mackey	10c	
770	N Bonanza	70@65c	
500	New York	40@35c	
350	Occidental	2@2.05	
170	Ophir	20@19¾	
605	Overman	9@9¼	
95	Potosi	4.10@4	
190	Silver Hill	80@85c	
190	Scorpion	3.30@3¼	
90	Savage	6¾	
80	Seg Belcher	22@23	
625	Sierra Nevada	22@22¾	
190	Utah	12¼	
540	Union Con	50@48	
240	Ward	2.05@2.10	
100	Yellow Jacket	11¾@11¾	

AFTERNOON SESSION.

1070	Argenta	1¼@1.45	
1250	Albion	35@40c	
1495	Addenda	50@60c	
600	Atlas	5c	
165	Boston	1¼@1.35	
125	Belmont	65c@75c	
250	Booker	45c	
620	Bulwer	12@13	
135	Bodie	8¾	
260	Bechtel	1¼@1.60	
150	Belle Isle	1¾	
150	Black Hawk	.85@80c	
600	Belvidere	1	
100	Champion	15c	
50	G Pacific	5	
240	Dudley	.55@56	
730	Day	70@75c	
115	Eureka Con	17¾@18	
2200	Endowment	40@35c	
400	Goodshaw	40c	
110	Golden Terra	10¼	
240	Grand Prize	1¼@1.65	
650	Gila	10c	
400	Hillside	2@1.95	
200	Independence	1.10	
25	Jackson	3¼	
150	M White	1.40@1.50	
930	Mammoth	2.90@2¼	
110	Mono	5¾@6	
1000	May Belle	25c	
200	McClinton	50c	
125	Mt Diablo	16	
125	Manhattan	1¾	
150	Metallic	1.10	
95	Northern Belle	10¼	
560	Noonday	4¼@4.90	
285	N Noonday	3.70@3¾	
250	Navajo	40@35c	
315	Orient	45c@40c	
870	Oriental	55@65c	
815	Paradise	1	
776	Queen Bee	25c@1.00	
270	Raymond & E	95c@1	
150	Real del Monte	1.40	
1500	S Bulwer	.90c@	
100	S Noonday	1.80	
50	Silver King	6¼	
70	S Bodie	15c	
50	Summit	1¼	
120	Syndicate	1¼	
650	Tioga Con	2¼@2¾	
1050	Tiptop	3.90@3.60	
870	University	15@20c	
235	Wales	3¼@3.05	

Tuesday A. M., Jan. 13.

300	Alpha	10	
320	Alta	4¼@4.15	
230	Andes	.60@65c	
285	Beuton	2.80@2¾	
160	Bullion	4¾@4.55	
80	Bechtel	1.80@1.85	
80	Best & Belcher	13¾@13¾	
70	California	4.35	
400	Con Virginia	4.35@4¼	
625	Chollar	8@8¼	
215	Con Imperial	.80@75c	
1050	Crown Point	4.20@4¼	
110	Confidence	8	
400	Con Benton	1¼	
300	Con Washoe	25c	
300	Cosmopolitan	.35@30c	
200	Cosmopolitan	2	
620	Caledonia	1¼@1.65	
150	Dardanelles	90c	
210	Exchequer	3¼	
700	Flowery	.35c	
250	Fairfax	70c	
180	Gould & Curry	5¾@6	
180	H & Norcross	8¼	
200	Julia	2.35@2.40	
85	Justice	2¼@2.15	
30	Kentuck	3¾	
1575	Leviathan	.75@85c	
260	Leviathan	35c	
275	Lady Wash	.70@65c	
1050	Mackey	10c	
160	Mexican	20@20¼	
100	Occidental	2	
195	Ophir	19¼@19¾	
145	Overman	8¼@8¾	
125	Potosi	4	
150	Savage	6¾@6¾	
60	Seg Belcher	21@20	
235	Sierra Nevada	21	
640	Silver Hill	85@75c	
1155	Union Con	4¾@4¾	
120	Ward	2.05@2	
235	Yellow Jacket	10¿@10¿	

AFTERNOON SESSION.

830	Albion	35@40c	
1050	Addenda	.55@60c	
300	Altas	10c	
2020	Argenta	1¼@1.40	
160	Belmont	75c	
100	Black Hawk	75c	
100	Boston	1¼@1.40	
100	Bulwer	11c@10	
485	Bullion	4¾	
125	Bodie	9	
130	Belle Isle	1.65	
1500	Bechtel	1¼@1.95	
300	Belvidere	.95c@1	
100	Booker	45c@50	
100	Caledonia (B H)	2¼	
2100	Champion	20c	
125	C Pacific	5@4¾	
200	Day	75c	
200	Dudley	.80@85c	
50	Eureka Con	17¼@16¾	
2050	Endowment	.40@45c	
600	Gila	10c	
250	Grand Prize	1.70@1.65	
50	Goodshaw	45c	
540	Hillside	2@1.90	
190	Independence	1.10	
50	Jupiter	1¼	
470	Metallic	1¼@1.80	
285	Martin White	1¼@1.20	
575	Mammoth	2.70@2¼	
1250	May Belle	.25@30c	
270	McClinton	60c	
30	Mono	6	
85	Mt Diablo	15¼@15½	
100	N Belle Is	40c	
320	Noonday	4	
150	N Noonday	1.70	
850	Navajo	.40@35c	
280	Northern Belle	10¼	
1200	Oriental	.55@65c	
100	Paradise	1	
1225	Queen Bee	25c	
500	Real del Monte	1¼	
200	Raymond & E	1¼	
700	S Bulwer	.95c@1	
460	Star	15@25c	
200	S Noonday	1¼	
100	Silver King	6¾	
420	Syndicate	1¼	
200	Summit	1	
500	Tioga	2¼	
1155	Tiptop	3¼@3¾	
385	Wales	3¼@3.05	

Wed'sday A.M., Jan. 14.

120	Alpa	11	
450	Alta	4.20@4.30	
150	Andes	.70@75c	
820	Best & Belcher	13¾@13¾	
820	Bullion	4.95@5	
2215	Belcher	10@10¼	
1295	Benton	2.80	
800	Cosmopolitan	40c	
80	Confidence	81@85	
390	California	4.35@4.40	
285	Con Virginia	4.60	
1220	Chollar	9@9¼	
450	Con Imperial	.85@85c	
335	Con Imperial	8¼@85c	
2390	Crown Point	5¾@5¾	
660	Challenge	2@2.05	
235	Caledonia	1¼@1.70	
350	Dardanelles	90c	
555	Exchequer	3.80@3.70	
550	Flowery	35c	
825	Gould & Curry	6¼@6¾	
550	Golden Gate	2.40@2	
560	Hale & Nor	8¼@9	
645	Justice	2¼@2.45	
705	Julia	2.55	
65	Kentuck	4	
405	Leviathan	.35@40c	
400	Lady Wash	65c	
5235	L Bryan	90c@1	
1015	Mexican	20c@19¾	
50	Mackey	5c	
230	N Bonanza	.60@65c	
1550	New York	40@35c	
135	Occidental	2	
330	Ophir	21@20¾	
185	Overman	9¼@8¾	
1565	Potosi	5@5¾	
260	Scorpion	3¼@3.30	
345	Silver Hill	.85@90c	
80	Seg Belcher	22@23¼	
330	Sierra Nevada	22@23	
85	Savage	7¼	
40	Utah	12¼	
725	Union Con	4¾@4¾	
310	Ward	2.05@2¼	
575	Yellow Jacket	11¼	

AFTERNOON SESSION.

260	Argenta	1.45@1.40	
1260	Atlas	5c	
1260	Addenda	.50c	
1200	Bullion	4¾	
120	Bodie	9@8¾	
130	Belle Isle	1.80@1¾	
45	Bulwer	10¼	
1360	Bechtel	1¼@1.55	
650	Booker	.50c	
100	Black Hawk	.75c	
260	Belvidere	.75c@1	
200	Boston	1.35	
100	Con Pacific	4¼@5	
1350	Champion	20c	
100	Caledonia (B H)	2¼	
345	Day	75c	
50	Dudley	.60c	
100	Eureka Con	17	
1000	Endowment	50c	
520	Gila	10@15c	
320	Grand Prize	1.70	
375	Goodshaw	40@35c	
1295	Hillside	2@1.90	
950	Independence	1	
10	Jackson	3¼	
170	Jupiter	1¼	
200	Leopard	10c	
100	Leeds	80c	
100	Manhattan	1.90	
90	Metallic	1.65	
20	Mt Diablo	15	
300	McClinton	90c@1	
325	May Belle	25@30c	
30	Mono	6	
250	Mammoth	2¼	
150	M White	1.30@1.40	
125	Northern Belle	10¼@10¾	

100	Navajo	40c	
920	Noonday	5	
280	N Noonday	3¾	
200	Orient	60c	
250	Paradise	1	
500	Queen Bee	25c	
790	Raymond & E	1	
192	Real del Monte	1¼@1.45	
600	Star	2@c25c	
100	Summit	1¼	
600	Syndicate	1¼	
1450	S Bulwer	95c@1	
710	Silver King	6¾@7	
100	S Noonday	1¼	
950	Tioga Con	2¼@2¾	
90	Tiptop	3¼@3.30	
250	University	20c	
300	Wales	3¼@3.05	

SALES OF LAST WEEK AND THIS COMPARED

Thurs'd'y A. M., Jan. 8.			Thursday A.M., Jan. 15.		
80	Alpha	10	715	Alta	4¼@4.20
345	Alta	4.10@4.05	510	Andes	.70@75c
500	Andes	.75@85c	1050	Best & Belcher	13½@13¾
2200	Benton	2¼@2.60	2005	Belcher	10¼@10¼
1770	Belcher	6¼@8¼	1015	Bullion	4.95@5
120	Best & Belcher	13¾	620	Benton	2¼@2.35
90	Bullion	4.60@4.95	235	California	4.30
150	California	4.20	255	Con Virginia	4.45@4.40
120	Con Virginia	4.65	950	Chollar	8¼@8¾
140	Chollar	7¼@7¾	0.0	Crown Point	3¾@4.85
995	Crown Point	3¾@3.65	445	Con Imperial	.90@85c
650	Con Imperial	.55@50c	70	Confidence	8@8¼
30	Confidence	8	125	Caledonia	1.60@1.70
255	Caledonia	1.55@1.60	925	Challenge	2@1.85
470	Con Dorado	1.65@1¼	1450	Con Dorado	1.80@1¾
250	Dardenelles	80c	200	Dardanelles	90c
250	Exchequer	3.45@3.30	305	Exchequer	3.70@3.60
725	Flowery	35c@30c	600	Flowery	35c
1500	Fairfax	65c	600	Fairfax	60@75c
410	Gould & Curry	5¾@5¾	505	Gould & Curry	6¼@6¾
710	Golden Gate	2.30@2	1450	Golden Gate	3
115	Hale & Nor	8	270	Hale & Nor	8¼@8¾
315	Justice	2.30@2¼	415	Julia	2.40@2.35
240	Julia	2.35@2.40	210	Justice	2¼
960	Lady Bryan	30c	1450	Kentuck	4@4.10
150	Leviathan	40@35c	2385	Lady Bryan	1.20@1.45
365	Lady Wash	55@60c	675	Leviathan	40c
215	Mexican	19¼@19¼	470	Lady Wash	70@75c
120	Mackey	20	820	Mexican	20@19¾
700	N Bonanza	70@65c	200	Mackey	5c
280	Ophir	19¾@20¼	1360	New York	45@50c
145	Overman	7¾@7¼	635	N Bonanza	65@60c
140	Occidental	1.60@1¼	160	Ophir	20
100	Savage	6¾	125	Overman	8¼@8
650	Sierra Nevada	19¾@20	325	Occidental	2
100	Scorpion	3.10@3¼	150	Potosi	5@5¾
320	Silver Hill	80c	195	Savage	7¾
10	Seg Belcher	16¼	710	Sierra Nevada	22¼@21¾
55	Utah	11¾	875	Silver Hill	80@90c
545	Union Con	4¾@4¾	675	Scorpion	3.30@3¼
100	Ward	1¾	330	Utah	11¾@12
35	Yellow Jacket	11¼@11	1185	Union	47@46¾
			500	Wells-Fargo	10c
			340	Ward	2.10
			590	Yellow Jacket	10¾@10¾

AFTERNOON SESSION.

450	Argenta	1.45@1.35	
1175	Addenda	.60@55c	
100	Atlas	5c	
100	Boston	1.40	
225	Bodie	8¼@8¾	
150	Booker	50c	
200	Belvidere	.95@85c	
100	Black Hawk	.80c	
145	Bechtel	1.65@1.60	
40	Bulwer	10¼	
200	Belle Isle

Pacific Board—Latest Sales.

Wed'sday A.M., Jan. 14.		60 Utah	12½@12¾
120 Andes	65@70c	50 Ward	2.10
650 Atlas	10@12c	50 Yellow Jacket	11¼@11½
50 Alta	4.60@4.70	AFTERNOON SESSION.	
165 Alpha	11@11½	50 Alta	4.30
220 Bullion	4.95@5	100 Belcher	3.85@3.90
140 Best & Belcher	13@13½	60 Benton	2.70
875 Belcher	9@10	40 Bullion	4.80@4.85
170 California	4.30@4.35	50 Best & Belcher	13¼@13½
70 Chollar	9	140 Crown Point	4.85@5.10
1310 Con Imperial	85@80c	50 Con Imperial	80c
860 Crown Point	5.40@5.50	70 Chollar	8¾@8¾
50 Con Virginia	4.45	40 Caledonia	1.90
100 Caledonia	1.85@1.80	50 Endowment	50c
100 Endowment	45c	10 Exchequer	3
180 Exchequer	3¼@3.60	100 Gould & Curry	6¼@6¾
160 Gould & Curry	9	10 Hale & Nor	8
220 Hale & Nor	9	20 Julia	2
325 Julia	2.45@2.60	20 Justice	2.80
40 Justice	2.40	120 Mono	8
150 Mexican	20@19½	10 Mexican	19
560 New York	35@40c	100 Mammoth	2½
50 Overman	9¼@9¾	300 New York	45@40c
210 Ophir	20¼@20½	10 Overman	8½
330 Potosi	5.20@5¼	50 Potosi	4.85
10 Seg Belcher	2¾	260 Silver Hill	85c
220 Savage	7¼@7¾	20 Scorpion	3.30
45 S Nevada	21¼@21½	40 Union	46¾@46½
30 Union Con	47	80 Yellow Jacket	10¾@11

California Board—Latest Sales.

Wed'sday A.M., Jan. 14.		30 Yellow Jacket	11¼@11½
20 Alpha	11	AFTERNOON SESSION.	
80 Argenta	1.55	20 Alpha	11
440 Belcher	10@9¾	30 Alta	4½
180 Bullion	5@4.90	150 Andes	70c
150 Benton	2¼@2.70	240 Argenta	1.55@1.60
40 Con Virginia	4.55	200 Belcher	9¼@9¾
205 Crown Point	5¼@5¼	30 Best & Belcher	13¾@13
170 Exchequer	3¼@3.55	80 Bullion	4.90@4.85
550 Endowment	50@55c	90 Benton	2.80
190 Gould & Curry	6¼@6¾	400 Black Hawk	1¼@1.05
70 Hale & Nor	8¼@9	200 Con Imperial	80c
150 Julia	2¼@2.45	90 Crown Point	5¼@5.05
50 Justice	2.30	50 Chollar	8¾@8¾
150 L Bryan	85c	140 Con Virginia	4½
40 Mexican	20 @21	50 Confidence	8½
150 Mint	6@7c	100 Enterprise	1½
100 New York	40c	40 Gould & Curry	6¼@6.20
40 Overman	8¾@9	30 Hale & Nor	8¾@8.70
30 Ophir	20¼@20½	100 Justice	2.40
260 Potosi	5@4.90	250 Lady Bryan	90@85c
20 Savage	7¼@7¾	30 Mexican	19¼@19½
350 Senator	2@65c	100 New York	40c
30 Sierra Nevada	21@21½	20 Ophir	20¼@20½
30 Union	46@45¾	120 Orbett	30c
40 Utah	12¾	30 Potosi	4.90@4.95
40 Ward	2.10	20 Union Con	46¾
150 W Comstock	20c	50 Wales	3¾
200 Wells Fargo	10c	20 Yellow Jacket	11

Mining Share Market.

Operations have been light with modcrate fluctnations during the week, the most prominent being in Belcher; the statement of a strike not being powerful enough to cause more than a spurt, which is not yet looked upon as indicative of any strong action. All attempts to render the market buoyant have so far signally failed. The general business depression which, instead of subsiding, is evidently increasing, has a marked effect on the dullness of stock operations.

The Butte Creek Hydraulic M. Co. have rescinded the assessment, No. 4, of 15 cents per share, which was to have been payable February 13th.

On the Comstock, on the 2400 level of the Union, the finding of promising vein matter with low-grade ore, when east country rock or barren vein matter was looked for, was an agreeable surprise. The indications south and toward the Mexican line on this level are also an item of interest. The Gold Hill *News* says: The problem of mining at greater depths than have ever been reached in America bids fair to be practically and profitably solved in the near future hy the Yellow Jacket, Crown Point and Belcher. At present it can only he said that the prospect in these mines is good. It is known that helow the 2800 level of the Yellow Jacket there is pay ore, hut the amount and the characteristics of the formation are unknown. It is helieved that the formation continues through Crown Point. Belcher has demonstrated the existence of her vein as a well-defined formation hearing live and promising quartz as far down as the 3000 level; and on the 2760 level has fonnd hunches and streaks of pay ore, hut not in stoping quantities. The ore has not yet heen traced to any well-defined or continuous body; nor is it yet known whether it will make or give out. The promise of the future is hased mainly upon the fact that ore has been found; and that it will make and not give out is indicated hy the further fact that the ledge is some 40 feet nearer the incline on the 3000 level than on the 2760, showing it to he taking a steeper pitch. But if ore is there it will take six months yet to open it up. Overman is getting very promising rock in her crosscut east on the 1900 level, corresponding with the 2160 level of Belcher. Alta and Justice are showing up some good prospects to say the least, and these continue into the Silver Hill.

Bullion Shipments.

Since our last issue, we have noticed the following hullion shipments :

Eureka Con., Jan. 7th, 32,920 lbs.; Jan. 8th, 33,890 lbs.; Jan. 10th, 29,305 lbs.; Belmont, Dec. 29th, $3,317.25; Jan. 2d, $3,435.72; Bartell M. Co., Dec. 28th, $1,448.92; Paradise M. Co., Jan. 9th, $3,238.45; Jan. 14th, $4,942.85; Richmond, Jan. 10th, $1,743.04; Wells, Fargo & Co. at Eureka, Jan. 10th, $1,500; Ophir, Jan. 7th, $20,772.06; Grotefend, Hull & Co. Jan. 10th, 23¾ lbs. retorted gold; North Bloomfield in Dec. $29,955.00; Endowment, Jan. 3rd, $2,540.00; Argenta, Jan. 12th, $7,700.00; Northern Belle, Jan. 7th, $6,502.56; total in December, $92,000 in hullion; Alexander M. Co. since October last, over $100,000; Stonewall Mill & M. Co. (Arizona) in Dec., $15,099.98; Silver Reef (Utah), in 1879, $1,115,667.18; and the total for three years past, $2,559,779.36.

Mining Summary.

The following is mostly condensed from journals published in the futerior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

AMADOR CON.—*Dispatch*, Jan. 10: A report is current on the streets this morning that a fresh body of good rock has been found in this mine. Its extent or richness is not yet known.

ZELLE.—*Ledger*, Jan. 10: At the Zello mine, satisfactory progress is being made with fitting the machinery in the mill. It will be in running order in March.

GRASS VALLEY GRAVEL.—The Grass Valley gravel claims, near Volcano, are not fairly started yet, the late severe cold having interfered with the water supply.

BUTTE.

ARMSTRONG.—*Mercury*, Jan. 0: A six-stamp quartz mill is in operation, having started up Monday. Eight tons were crushed the first day. The greater portion was not considered as pay rock, yet it yielded to the satisfaction of the proprietors and far in excess of their anticipations.

CALAVERAS.

GWIN.—*Citizen*, Jan. 10: Work in the lower levels has been suspended for the present, owing to too much water. Work in the 500 level is still being pushed forward. At present only 16 stamps are being run.

MINE SOLD.—The sale of the Bonanza mine, near Copperopolis, to Sidney M. Brown, for $5,000, has created no little excitement in the neighborhood of Black creek and Christian gulch, near Copperopolis. Quite a number of parties have taken up claims on the lead of the Bonanza.

MINING SPECKS.—*Chronicle*, Jan. 10: A new flume is being put in at the Maison de Sante. Several loads of lumber designed to be used for that purpose passed through town during the week. Operations are not suspended while the improvement is being made. A partial clean-up was made at the Bonanza, the gold being emptied out of but a few of the boxes. We learn that the boxes cleaned were in such a plethoric condition as to indicate that when a *bona fide* clean-up is made it will throw all previous yields in this vicinity into a total eclipse. At the Eureka hydraulic work is being urged as hard as it can be driven. No water is brought through the new ditch, as it is frozen at the head. A few days of warm weather would give double the quantity of water now used. There is no cessation of operations at the Duryea hydraulic. An immense amount of gravel is daily put through the flume. An extensive cave occurred in the Green Mountain tunnel claim, a short time since. The debris has all been removed. In the Mammoth hydraulic work is prosecuted at the upper or north end of the claim. Piping is conducted in the vicinity of the Lamphear quartz mine and mill with every prospect of resulting favorably to the proprietors. Work continues in the great tunnel enterprise of the Happy Valley Blue Gravel and Hydraulic Mining Co. The tunnel has reached a length of about 300 ft, and is pushed ahead as fast as the hardness of the rock will permit. The company has not yet resumed hydraulic operations. At the Safe Deposit, Rough Diamond and other claims, operations are prosecuted energetically. Work has been resumed at the Champion mine, West Point, things having thawed out sufficiently to permit the resumption of operations. We learn that good rock has been struck in the upper levels of the Gwin mine and also in the Alexander shaft.

MARIPOSA.

ITEMS.—*Gazette*, Jan. 10: Peter Longhurst has sold a quartz mine for $2,500 to some parties in Oakland. The mine is two miles above Bull creek. The Banderita mill commences grinding its own rock this week. The owners have concluded a contract for grinding rock which was on hand at time of sale. The company has 100 tons of ore out ready for crushing. This is a ten-stamp mill run by water power. The contractors for running a tunnel 200 ft on the vein of the Austin mine, near Bower cave, have completed 125 ft, and the rock taken out looks exceedingly well. The Virginia mine and mill is ready to start. Much is depending upon the result of this mine, which, if it yields as well as is anticipated, will give an impetus to mining interests in that section. Martin Flanagan has lately struck good ore in his mine.

MONO.

SPAULDING MILL.—Bodie *Chronicle*, Jan. 3: The Spaulding mill is making good headway toward completion. The machinery is on the ground and being placed in position. The eight pans and four settlers are in place, and the engine also. The engine, a 90-horse power, is from the Fulton Foundry, San Francisco. The boiler, already set, is of steel, 16 ft long and 54 inches in diameter. The battery-room is 20x40 ft, and the pan-room 48x63 ft. The tank-room is 32x36, and the boiler and engine-room 23x43, with a wing, 10x23 ft. The retort house is south of and detached from the main works, and is 10x20 ft. When completed the Spaulding will be one of the best mills of its size in the State.

NOONDAY.—The drifts and stopes are driven rapidly. Ore sent to the mill assays well. Pumps are working six hours daily. A new cage has been put in the shaft in place of the skip. The mill is working to its full capacity.

JUPITER.—The cutting out of tank stations is the only work going on underground, preparatory to putting down new pumps. A boiler-house, 18x38, is being erected for a double set of boilers for the new pumping machinery. The boilers are 16 ft long, with a diameter of 48 inches.

BOOKER.—Crosscutting at the 400 and 480 levels; that at the 400 is in 70 ft; the 480 in 25 ft. The rock in the crosscut at the 400 level is becoming iron-stained, promising a vein approaching. The tank station at the 480 level has been cut out and plunger No. 2 will be put in on Monday. The water continues strong, but the pumps have no trouble in handling it.

ORIGINAL SUMMIT.—A small prospecting shaft is being sunk on the vein, preparatory to selecting a place for the commencement of a working shaft. The shaft is down 54 ft, and the vein is looking well.

MAYBELLE.—Still sinking the winze on the vein. Down 54 ft, and vein looks well.

MONO.—The heavy body of water struck last week has been controlled, and sinking resumed. The shaft is down 520 ft. The pumps are working well.

SOUTH BULWER.—*Free Press:* Sinking of the shaft now down 400 ft is resumed. Two Cope & Maxwell steam plunger pumps have been put in, one at the 300 level, and one near the bottom. There is no water in the bottom of the shaft; it is thought that it is drained by the Standard pump. As soon as water may be struck, the company are in a position to handle it. A winze is being sunk on the ledge from the 300 level, which is now down 78 ft. The ledge in the bottom is four ft wide, of good ore. A new boiler has been put in, and the hoisting works enlarged, their present dimensions being 30x30 ft. Wood and supplies have been laid in for the winter.

SOUTH NOONDAY.—The shaft, a double-compartment, cribbed and timbered, is down 122 ft. A ledge four ft wide was cut 70 ft from the surface, its strike being north and south, and its pitch east. The ledge was in the shaft for about 20 ft, and passed out to the east. A level will be run at a depth of 150 ft, and the shaft will be continued down. A substantial building has been erected over the shaft, 25x50 ft.

QUEEN BEE.—Crosscutting east on the 400 level is in 80 ft. Numerous strata of good quartz have been passed through, and it is believed the ledge will be cut in a few days.

BELVIDERE.—The new shaft has reached a depth of 400 ft, and a station at that level is being opened. The ledge is from six to ten ft to the east, and it will be cut in a short time in the east crosscut; as soon after as practicable, north and south drift will he started on the ledge, continuing the east crosscut through the favorable ground developed in the 200 level.

STANDARD.—The north drift, 585 level, is in 608 ft. The ledge is four ft wide. The south drift is in 280 ft. The ledge in this drift is three ft wide and continues to look well. The east crosscut, 500 level, is in 130 ft. The south drift from the west crosscut, 300 level incline, is in 115 ft. The ledge in this drift is two and a half ft wide. The east crosscut, 300 level incline, is in 94 ft. Rock in the face is very hard. In the 700 level, on the east side, the rock is very hard, but the west crosscut is in good running ground. There has been an increase in the flow of water. Sinking the shaft, which is 40 ft below the 700 level, has been resumed. The stopes throughout the mine are looking well. In the north drift, 385 level (vertical shaft) they are stoping from a ledge from 5 to 20 ft wide of good milling ore. On the 550 level, south drift, the ledge in the stope is eight ft wide of good ore.

WEST STANDARD.—This property continues to yield high-grade ore.

DOUBLE STANDARD.—The east crosscut from the bottom of the winze is in 77 ft. The north drift from the east crosscut, 200 level, is in 48 ft. The south drift, same level, is in 52 ft.

DUDLEY.—On the 500 level the main west crosscut is in 117 ft, with some change of ground for the better, which is much softer, and is working well.

TIOGA.—*News:* Shaft down 735 ft, and the vein in the shaft continues to improve; have cut several strata of rich ore, carrying free gold in large quantities.

SYNDICATE.—The drift is now in 644 ft, the face in hard ground. The east crosscut on the 620 level has advanced in vein formation and the indications favorable for soon cutting the ledge.

RALSTON.—The upraise from the 520 level, to connect with the 320 level on vein No. 3, is now up 57 ft, the whole face being in good milling ore.

ORO.—The west crosscut, 230 level, is in porphyry; have cut a well-defined ledge, 16 ft in width of low grade. The east crosscut, same level, is in favorable ground; have cut numerous strata and bunches of ore. The water is lessening, and sinking will be resumed as soon as it is drained.

MARYLAND CON.—The whole bottom of main shaft is in vein matter, carrying seams of rich quartz and clay. The stopes on the 258 level are yielding good milling ore. The ore continues good in the drift on this level. The 500 level will be reached by the last of the month, at which point a station will be opened and crosscuts for the company's three ledges started. Rapid progress is being made in advancing the work. The machinery works smoothly.

SUMMIT.—The north drift, 500 level, is in from the incline 25 ft. The ledge is three ft wide. The south drift is in 27 ft. The ledge here is two ft wide.

NEVADA.

DAVENPORT.—*Herald*, Jan. 8: Nine tons of the rock were crushed during the cold snap, when it was impossible to save all the gold. The result was a 20-ounce bar, which gives a yield of $30 per ton.

PLANET.—*Union*, Jan. 10: A washing of 15 carloads of gravel, without using quicksilver, yielded $10 in fine gold. The gravel was taken out of the incline drift being sunk for the bottom of the channel, where the gravel and gold is expected to be found coarser.

SHAMROCK.—The shaft is down 180 ft, and rock is being breasted out on the ledge, which is 18 to 20 inches in width. About 60 loads of rock are on the dump. No crushings have been made from the mine. The company contemplate fitting up the Perrin mill to crush their rock.

MAMMOTH BAR.—The shaft has been completed and drifting for gravel commenced.

GODFREY.—*Foothill Tidings*, Jan. 10: Their mill is ready to run, and they are taking out fine pay gravel and cement from the new tunnel. The Godfrey mill obtained its supply of water and began dropping its stamps on good pay gravel cement on Wednesday, and all is working well. The present way of working this mine over that through the shaft on Alta Hill makes a direct saving of $20 a day, and indirectly, year in and year out, quite a sum in addition.

YUBA QUARTZ.—The pay chute recently found in the main drift continues to show gold and sulphurets freely, and has widened to six ft.

IDAHO.—*Transcript*, Jan. 11: A gentleman who visited the Idaho mine yesterday informs us that 1,200 ft east of the main incline, 1000 level, the compact porphyry has again been encountered in the footwall. Invariably in this and the Eureka mines such an indication has been associated with heavy ore bodies. Eight hundred ft from the incline in the 1100 level the vein is six ft thick. The bottom of the main incline is at a depth of 1,200 ft, showing steady improvement. There is much dead work to be done before the mine will resume its former condition.

SHASTA.

MINING JOTTINGS.—*Courier*, Jan. 10: Our miners are all busy taking out the precious metal. Grotefend, Hull & Co.'s ledge at Mad Ox has 400 tons of ore on the dump, and the company continues to extract ore. Dr. E. L. Reese, of the Afterthought, is running off large quantities of ground, and is much encouraged at the way the mine prospects. The Impier company are at work sinking on their ledge, which looks well and widens as they progress. A. Potter, owner of the mill near Spring creek, is working his mill with rock from his various ledges, and is satisfied with the result. The Chenoweth ledge, near Middletown, is paying well, their only difficulty being the want of water on account of a break in the Clear Creek ditch. At Whiskytown there are various mines paying well, and the recent development in quartz near Deadwood has made French Gulch a prosperous town once more. The following named owners of mines were visited last week: Frick & Davis mine; H. E. Willey, Sebastion; Fred Diner, Henry Dore, McConnell. The above mines are near Deadwood, and the owners are clearing big pay from them. The Shafter quartz ledge is on French Gulch and Deadwood, from which he clears about $1,500 per week. The ledge of Frank Bros. is five miles west of French Gulch. They have cleared $3,500 in three clean-ups, and are about to make another one. The mines of George Kloin, near here, are said to be of the best in the district. At and near French Gulch there are many placer mines, and a good many smaller quartz claims, all paying well.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Gold Hill *News*, Jan. 14: The east drift on the 2400 level is in from the shaft 188 ft. On the 2300 level the south drift toward the joint Mexican winze is in 460 ft.

OPHIR.—Preparatious for extending the pumps to the 2500 level and the construction of chutes at that point are going on. The north drift, 2500 level, is in fine-looking vein material carrying low-grade quartz; total length, 105 ft. The south drift, 2300 level, has reached the California line. The joint Mexican crosscut on this level is in soft vein porphyry, which requires close timbering; total length, 288 ft. The workings north on the Hardy vein, 2100 level, continue in heavy vein matter carrying quartz and clay; total length of drift from crosscut No. 1, 328 ft.

CALIFORNIA.—There are at the office about $52,000 in bullion, which will be shipped Saturday evening. Repairs on the 850 level have been so far completed as to admit of the resumption of work in that part of the mine and the north drift is being continued. The incline raise from the 1750 level for the 1650 is up 112 ft ou the slope. Connection will be made the last of this week or the forepart of next. The north drift on the 2250 level is in vein matter carrying low-grade quartz; total length, 250 ft. The Ophir south drift, 2300 level, is being continued on to connect with the C & C shaft at the 2450 station, and the shaft is to he sunk to that depth.

BELCHER.—The workings both north and south from the crosscut east, on the 2760 level, have been suspended to timber up. These workings have been pushed along the streak of ore about 35 ft in all, of which some seven ft are north of the crosscut. The streak of ore has been found to extend about two ft up from the hottom of these workings, so that the prospects lie helow the 2760 level. On the 3000 level the main east drift is in the vein, which contains bright, lively quartz. The south drift to get under the prospects on the 2760 level is still skirting the vein.

ALTA.—The north drift on the 1950 level is in 90 ft in quartz which gives low assays. The south drift, same level, is in the same distance in very much the same character of rock. The Lady Washington drift, on the 1550 level, will reach the north line of that mine to-day. The next movement will be to send crosscuts into the ledge in two or three places.

SAVAGE.—After the completion of the station at the 2400 level of the C. N. S. shaft, the work was turned over to the said shaft to be run. The incline has been cleaned out and repaired a distance of 125 ft on the slope. Connection with the Hale & Norcross on the 10th level is still being repaired.

CON. VIRGINIA.—There are on hand and ready to be shipped Saturday evening over $50,000 in bullion. The main crosscut west, 850 level, is ready for further work. The stopes on the 1550 and 1750 levels continue to yield ore.

SIERRA NEVADA.—The work of timbering the west drift, 2300 level, west of the incline, has been completed, as have also the chute on this level. The north drift, 2300 level, is passing through soft vein material. The north drift on the 2200 level is in a favorable vein formation; total length, 330 ft.

JULIA CON.—Work has been resumed in the southeast crosscut on the 2000 level. The winze from the 1800 level is going down and cutting a fine quartz formation. The water in the mine is handled by the pumps, but they are run nearly to their full capacity.

GOULD & CURRY.—The joint east crosscut on the 1700 level is 1,575 ft from the main north lateral drift and is still in dry ground. This crosscut is nearing the perpendicular of the new G. & C. and B. & C. shaft, its objective point.

MEXICAN.—The north drift on the 2300 level is now in 370 ft, the face in low-grade quartz.

CHOLLAR.—The drift on the 2100 level from the shaft is in 475 ft, and will reach a point from which the main lateral drift south, through Chollar into Potosi ground, will be started.

BELMONT DISTRICT.

BELMONT.—*Courier*, Jan. 3: The mine never looked better. In the north end for a distance of 300 ft there is a stope of low-grade ore that will average from $15 to $30 per ton, which is opened by two raises and two levels. This ore body is connected with the shaft from 300 to 500 levels, and there are thousands of tons of low-grade ore that can be taken out. On the 000 level a ledge has been cut 30 ft wide and carries from 8 to 12 ft of low-grade ore. This is the lowest point in the mine in which ore is found, and such a quantity of low-grade ore proves that the Belmont is a permanent mine. The stopes are producing their usual quantity of ore. The concentrator will start up on the 15th. Supt. Rogers feels sure that it will work satisfactorily, and then the thousands of tons of low-grade ore in the Belmont mine will be turned into silver bricks.

BRISTOL DISTRICT.

BRISTOL.—Pioche *Record*, Jan. 10: Work is being pushed ahead on the Gipsy and Cave mines, of the Bristol company. One of the trustees of the company is now in Chicago purchasing machinery for a 10-stamp mill, which will be shipped at once, a contract having been made with Warnock & Co. to deliver the same during the month of February. As soon as the result of the Raymond & Ely chloridizers is made known, if a success, the Bristol company will order the same.

HILLSIDE.—The Hillside furnace started up yesterday and is running well, with machinery in splendid working order, a large amount of ore on dump and from 35,000 to 40,000 bushels of coal on hand. The cupel furnaces are in good working order.

MEXPHIA.—A large body of high-grade ore has lately been uncovered in the 110 drift off the old shaft, which is improving as the work goes down. Good ore is being taken out from all parts of the mine, especially from the old workings on the first level.

LAURA G.—Work, which has been suspended upon the the Laura O. for some time, will be resumed this coming week. The lessees have let a contract to run a tunnel, tapping the main ledge at a depth of 110 ft.

EUREKA DISTRICT.

CENTRAL HILL.—*Sentinel*, Jan. 7: Some high-grade ore has recently been extracted. The mine is owned by M. H. Joseph and Mr. Peterson, both of whom are elated over their promising prospect.

CALIFORNIA.—*Sentinel*, Jan. 10: This mine, lying immediately south of the Conuolly, on the lead, is looking well. Competent miners regard it as one of the most valuable mines to the southward of Ruby hill. It is the property of Joe Mendes, Alex. McKenzie & Co., and is being worked with good results.

TYBO DISTRICT.

MORAY.—Tybo *Sun*, Jan. 10: The principal work now going on is sinking the main shaft and running a tunnel. In the shaft they are having some trouble with water, but the tunnel will drain the shaft and enable them to sink faster. The tunnel will tap the shaft at 400 ft.

TYBO.—The mill has been running steadily, but will shut down for a day or two, to make repairs. The output of bullion from here for the month of December was something over $10,000.

ARIZONA.

TRUE BLUE AND ORONELL.—Pima *Record*, Jan. 3: Thes two mines have been sold to New York and Boston parties for $25,000—20 days being allowed for payment.

TUCSON DISTRICT.—Capt. W. L. Campboll reports that many valuable claims are located in Tucson district, which is situated about 60 miles from Tucson and 10 miles south of Tubac, running along the Sonora line and taking in the west side of the Patagonia mountains.

ESPERANZA.—*Citizen*, Jan. 3: The Esperanza sale has gone through. The parties who were sent here to examine the mine, made such an examination as satisfied them that there was enough ore in sight to more than pay for the property if not another foot of sinking were done. Some $200,000 worth of ore, assaying over $100 a ton, was measured. Work will be pushed ahead. The chances for getting through the mundie are better.

MINING ITEMS.—*Arizonian*, Jan. 2: Mr. J. H. Kelley, who has followed placer mining on the Hassayampa for 10 consecutive years, informs us that about 20 men are now employed in sluicing on that stream, mostly at the mouth of Copper creek. They average from $2 to $6 per diem, and there is plenty of ground there for more miners. George Carr is at work on the old Jackson hydraulic claims, on Lynx creek, and is doing well. Mr. Smith is ground-sluicing in the same locality, with good results.

TOMBSTONE ITEMS.—*Nugget*, Jan. 8: The new working shaft at the Head Center, about half way between their prospect operations and the Contention hoisting works, is 115 ft deep, and the rich gold ore, which has always characterized that mine, has been found. Some silver specimens, taken out at a lesser depth, looked to us as though they might be equal to anything the district has ever known. Owl's Nest or Minerva, is now a bone of contention. Three different parties are working on the claim. It will result in a thorough test of the claim. Work of developing has been commenced on the Longfellow, Contact, Eagle, Iron Clad, Baker, Randolph and Junietta claims. Commenced on the 5th hauling ore to the mill from the Lucky Cuss mine.

MINING NOTES.—*Miner*, Jan. 10: Messrs. Everett and Waite have purchased an interest in the Cachise, Washington district, and are moving men and material to the ground, preparatory to sinking a 50-ft shaft. The Cachise is parallel with and adjoins the Pensacola on the west. Five miles from Harshaw, on the northwest slope of the Patagonia mountains, Mr. Crooker has found a well-defined carbonate ledge, going 200 ounces. Oeo. Atkinson has struck it rich west of the Blue Nose; fine body of galena and carbonate ore assaying $90.

COPPER MINES.—Mr. Holland, just in from the Huachucas, reports the discovery and location of an immense body

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Governor Perkins' Inaugural Address.

As this is acknowledged to be a time of unusual moment in our public affairs, and as our industrialists should be fully informed concerning the position taken by the new administration, with regard to their interests, we quote from the inaugural address of Governor Perkins the following paragraphs, in which the material welfare of the State is discussed:

Agricultural and Mining Interests.

Of the largely diversified interests of California, agriculture and mining are the principal sources of our prosperity and wealth. All cereals and fruits here yield most abundant harvests. The soil responds to man's industry, and rewards his labors. Yet, ancient and honored as is agriculture, constant improvments are being made in its departments, and new discoveries augment the net gains. It is the duty of the State to foster the agricultural interests by providing for the dissemination of trustworthy information respecting her resources, the character and adaptation of her soils, so that the newcomer may enter upon his labors with an intelligent confidence in the result.

A progressive step has been taken during the past year at the University, in the establishment of a garden of economic plants, in which a large number of growths proposed for culture in this State are being tested.

Still the science of agriculture in our State is yet in its infancy. The peculiarity of our soils, seasons and climate, makes the ripe experience of other countries unavailable to us in our methods of agriculture. An unskillful and unscientific agriculture will impoverish our soil and eventually convert our fertile valleys into desolate wastes. The carefully collected experience of the older States, which constitute the literature of the science of agriculture, being unavailable to us, we are dependent upon self-instruction for what we now know or have yet to learn of the most scientific methods of field and orchard cultivation. The Bureau of Agriculture at the National Capital is a most valuable aid in the dissemination of intelligence on the subject of scientific agriculture, as that science may relate to the laws of production under the conditions existing in the great body of States in this Union. But the peculiarities of condition existing in this State call for the evolution of a special science of agriculture, and as a means to that end I most respectfully recommend that through our Congressional delegation in Washington, the Congress of the United States be memorialized to establish a branch of the National Bureau of Agriculture on the Pacific coast.

Further, and appropriately in this connection, your attention is respectfully directed to the wise encouragement heretofore given by this State in the way of promoting a higher agriculture by stimulating annual exhibitions of the highest results of industry. This encouragement should be continued under the guarded restrictions of the Constitution of our State.

Mining, for a long time the principal pursuit of our people, is still one of the most active and profitable industries. Its importance to the State and to the nation cannot be overestimated or gainsaid; and it is not without pride that we point to the fact that, since the discovery of gold here, California alone has produced over $350,000,000, more than the aggregate productions of all the rest of the United States. As results are the measure of success, these many millions prove the importance—State and national—of the mining industry, and ought to relieve it of its supposed speculative character. There is a broad and well-defined distinction between the legitimate California miner—the producer of these vast sums—and the stock speculator who deals in paper evidences of titles to supposed mining properties. While legitimate mining has accomplished so much for the State, it must be admitted that the State has not done all it ought to have done for mining. We provided for a State Geological Survey, which was barren of any useful results, and before its completion a School of Mines was founded at the University, the outfit of which has never been furnished, and its chair is vacant.

It is not due to the mining interest that the results of the geological survey already paid for, compiled and collected—such as are practical in their nature—be made public property, when no expense is entailed, except that of their publication? What has been done we should have the benefit of.

Debris.

In several sections of the the State a conflict has arisen between the mining and agricultural interests in relation to the debris washed down by the rivers. The best interests of the State require that this most important and most delicate question should be settled upon some broad and comprehensive basis. The report of the Board of Engineers, provided for by the last Legislature, will doubtless furnish you with information in this connection.

Irrigation.

The important subject of irrigation, with special reference to the San Joaquin valley, has been the topic of investigation by the State Engineer and his able corps, and it is expected that his report to the Legislature this session will present some data upon which may be based wise legislation.

Freights and Fares.

The progress made in the construction of railroads during the past half century, the convenient facilities they furnish for travel and for the rapid interchange of commodities, have brought their relations to the State into a prominence that cannot be ignored by those occupying, or who would occupy, official stations.

Transportation companies move the agricultural and manufactured productions of the world. Their growth has been so overshadowing that the earnest attention of the wisest statesmen of both hemispheres has been directed to the subject of governmental supervision. In some of the older States such supervision has been tried and abandoned. In others the experiment has met with approval, and has resulted in a better understanding between the public and the railway companies. In this State we have had two commissions created by statutory enactments and clothed with limited supervisory authority.

The railroad companies disputed the right of the State to interfere in their affairs, and this attitude undoubtedly tended to the adoption of the far-reaching provisions in the new Constitution intended to regulate and control transportation companies.

A commission authorized by that instrument has been chosen by the people. Its powers are almost unlimited, and partake of the legislative, executive and judicial. The wisdom of delegating such extraordinary powers to such limited numbers is not open to discussion or challenge in this place. The people, with whom the power rested, have so decreed, and it remains for their servants to obey. Yet I trust that the Transportation Commissioners will not consider me as exceeding official courtesy if I give expression to the hope that they will be able to effect a more harmonious relation between the transportation companies and the people whom they serve. Some of the constitutional provisions governing this subject are probably not self-executing, and will need legislation to give them the effect designed by their framers. I respectfully invite the attention of the Legislature to this subject, and recommend the passage of such laws as shall meet the requirements of the case.

Revenue and Taxation.

The highest prerogative of government, and one of the most difficult to deal with, is that of taxation. In his inaugural address in 1871, Governor Booth aptly said: "No scheme of taxation has ever been devised which was absolutely just; perhaps none can be." This condition must be accepted; but the nearest approach to equality of taxation that experience can suggest must be our aim.

The revenue laws of the State have been in great part abrogated, and much legislation on this subject is rendered necessary by the new Constitution. The taxation of mortgages, which is one of the new features to he dealt with, will not produce any additional revenue, and will only operate—for good or evil—between borrower and lender. It is required that the amount of the mortgage he deducted from the realty on which it is a lien, and the proceeding renders cumbersome and complicated the duties of both Assessor and Collector.

It is also required that all real and personal property, including credits, franchises, bonds and stocks, shall he taxed, and laws must he passed for the carrying out of this requirement. Not, however, in such manner as to result in double taxation, to which I am most emphatically and unalterably opposed. Debts due to A should be made an offset to a like amount of debts A might he owing to B, and the assessments made on the balance only. The stock of corporations is required to he taxed. If an attempt is made to tax the real and personal property, franchises, etc., of private persons and corporations, and another taxation of the stock and individual bonds, it would he double taxation, and, as such, oppressive and unjust. To prevent this, and at the same time to insure that all the property of any firm or corporation having a capital stock shall be properly taxed, would it not he the plan of wisdom to secure the assessment of all stock at its market value to the company issuing it, after deducting the value of all assessments on the real and personal property of such company as may have been otherwise made.

By this means many millions of dollars may be added to the taxable wealth of the State. The tax being paid hy the company, the distribution of the assessment among the stockholders would he equitable, while to attempt to assess the stock to individual holders would prove practically impossible, and result in much of it escaping taxation.

Under the present law improvements constructed on real estate which is itself exempt from taxation are not assessable. It seems only just that the code should he so amended that the improvements alone may he made liable for the amount of the tax.

The new Constitution makes provision for the assessment and collection of income taxes in such cases and amounts, and in such manner as shall he prescribed hy law; and while I am not prepared to recommend immediate legislation upon the subject, I am persuaded that a tax upon personal incomes exceeding, say, $5,000, properly and impartially executed, would be of most essential service in imposing the burden of taxation upon those most able to bear it, and compel them to aid in supporting the Government which makes possible the acquisition of wealth, and protects its possession, thus relieving the limited means of the less fortunate, and the small property of widows and orphans from unnecessary impositions. But for the constitutional inhibition against exemption of any property from taxation, I should have been happy to recommend a moderate exemption from taxation of the property of these certain classes of persons; but since that is impracticable, their burdens may be lightened hy a just and searching income tax.

Chinese Immigration.

At the last election, in accordance with the statute providing therefor, a vote of the people of this State was taken upon the question of Chinese immigration—"for" and "against" the policy of permitting it to continue unrestricted, as at present. Out of a total vote of 161,405, only 883 votes were "for" such immigration. The ballot was secret—there was no extraordinary excitement on the subject; the result should be accepted as a fair indication of the real opinion of our people on this important question. It ought to be accepted everywhere as conclusive evidence that there is practically no difference of opinion among the people of this State relative to the policy of prohibiting the further increase of the Chinese element of our population. The question has ceased to be a political issue with us. Men of all parties are in perfect accord that emigrants from China are a curse to this country, and that some adequate restriction upon their coming ought to be imposed without delay.

An experience of thirty years has convinced them that immigrants from China do not and cannot assimilate with our people. They come hither without families, with no accurate ideas of free government or of christian civilization; they retain their native dialects, their national prejudices, and even their race costumes. They take no interest in our political affairs, and manifest no desire to be identified permanently with the country, as do immigrants from other parts of the world. They are handicapped by labor contracts which reduce them to a condition worse than slavery, for the servitude cannot be abolished. Their contracts cannot be annuled by our laws, because they are founded upon the laws, customs and religious prejudices of China. The result is to renew in another form the "irrepressible" conflict between free and servile labor, which has already cost us one civil war. Hence the people of California say: Here is a new problem in American politics. Our republican government has extended its jurisdiction across the continent and stands face to face with the oldest civilization known to history. It confronts the most populous nation in the world—a country so populous that numbers equal to the entire population of the Union could be spared and their absence scarcely noticed. In all the Pacific States and Territories the population is less than one million and a half—utterly insignificant when compared to the 400,000,000 in China. It costs much less for the immigrant from that country to reach this State than it does for the immigrant from Europe, or even from the older States of the Union.

Already nearly one-third of the men among us who make their living hy their daily toil are Chinamen—Chinamen without families to support, while most of the white laborers have wives and children to provide for. In this country the family is the unit of society. It is the family that makes the home, and the homes of our people are the citadels of our liberty. It is there that respect for law and the love of freedom are fostered until they become so much a part of the nature of the child that when he reaches manhood he is a useful portion of the political fabric. The Chinese know nothing of this American home culture, and we believe they are incapable of comprehending it. Hence they can never become American citizens in the true sense of the word. Bound in servitude, they differ radically from the class of immigrants for whom our ancestors entertained so friendly a feeling, and whom we have always received with hearty welcome. A new evil arises, for which we must provide a new remedy; that remedy we believe is to restrict the immigration of that class of people; and it is for the Federal Government to apply it. The expression of opinion through the vote lately taken was intended for the purpose of influencing such action, and it is to he hoped that it may have that effect.

While we must look to the General Government for the complete redress of this evil, the people have attempted, in the New Constitution, to find some relief through the action of the State Government, by directing certain measures to be applied. The attention of the Legislature is therefore respectfully invited to this subject, with the assurance that whatever can be properly and legally done in this behalf by the State shall have my hearty co-operation.

Land Monopoly.

One great source of our success and prosperity as a nation is that, under a wise system, the public lands have been disposed of in small tracts to actual settlers. Attaching men to the soil hy ownership creates an independent and intelligent population. While there are large areas of dry and desert lands that cannot he cultivated without large expenditures for costly works of irrigation, and large areas of swamp lands unavailable for agriculture until vast sums are expended in their reclamation, yet, wherever hy legislation men have been enabled to monopolize and reduce to private ownership large tracts of farming land for purposes of speculation, it has been in opposition to the wise policy of the founders of the Republic, who sought to give every man wishing to cultivate the soil as much land as would support him and his family, and no more.

In the acquisition of California from Mexico we inherited the evils of a different system. Vast tracts, measured not by acres, but by leagues, of the best lands, had been granted to private individuals and secured to them by treaty. However much the public prosperity would be promoted by division and sale of these large tracts to actual settlers, I know of no mode by which they can be divided and sold without the consent of the owners.

The State could not exercise her right of eminent domain, and condemn them, for it would be an appropriation of private lands for private purposes; something unknown under our system of government. This evil must be left to time for its eradication. We can have no law of primogeniture and entail; therefore, the evil will not be perpetual. The fluctuation of business enterprises, the certainties of taxation, and the laws of inheritance will in a few years divide and subdivide these great possessions.

The new Constitution requires that cultivated and uncultivated land of the same quality and similarly situated, shall he assessed at the same value. This, with equal taxation prevailing to such an extent that the owner of his leagues of land shall be assessed the same value per acre as the owner of 100 acres, providing the land is of equal quality, and the few will soon realize the fact that it is not profitable to monopolize the lands of the country. As to the large bodies of public lands within our State still remaining the property of the United States and of the State, that can he cultivated without large expenditures for irrigation and reclamation, I am in favor of such disposition of them only as will provide for their conversion into homes of not exceeding 160 acres for actual residents thereon.

But while I consider the policy of taxing uncultivated lands equally with cultivated lands of the same quality to be not only a step in the right direction, but one of the most important reforms in the new Constitution, yet the carrying out of this important trust will devolve upon the Assessors of the different counties and the State Board of Equalization; and if they faithfully perform the duties assigned them there is no doubt in my mind that the immense tracts of uncultivated lands now held for speculative purposes will soon be a matter of history.

It is estimated by the United States Surveyor-General, that there is yet in this State about forty millions of acres of public lands unsurveyed. Our Senators and members of Congress should be requested to urge Congress to make the necessary appropriation to have these lands surveyed, and conveyed to actual settlers only, as it can but conduce to the encouragement of immigration to this State of intelligent, thrifty and sturdy farmers from other States and countries, to come and settle in a State which possesses such unbounded resources. I shall be pleased to give my hearty co-operation and concurrence to any legislation which favors a policy of conveying our public lands to actual settlers only, and the discouraging of holding large landed estates.

Harbor Commissioners.

The Board of State Harbor Commissioners reported to the late Legislature a bill which provided for a new water front for the city of San Francisco, and recommended that the lands reclaimed by their proposed plan, if adopted, should he sold.

The Legislature confirmed their suggestions, but wisely declined to authorize the sale of the reclaimed lands. The question now arises, what shall he done with them? Shall they he sold, or he held as the property of the State?

The port of San Francisco belongs to, and is of most vital importance to, the State of California; and her citizens are her agents in the domestic and foreign commerce of the State. The State has reserved ownership of the lands on the city front, and controls and directs their use for commercial purposes. Every facility that can he afforded to cheapen the cost of carrying on the exchange of products of the State for those of other countries needed to supply her wants, is of direct pecuniary advantage to every one of her citizens, however remote he may reside from this, her commercial seaport. A wise statesmanship will foresee and provide for her future commercial requirements, and make such provisions in advance as will create new sources of prosperity, or hasten and secure them to herself. Necessarily the surplus products of our State find their money value measured hy prices fixed in foreign ports, and under foreign competition; hence every dollar that can be saved in the cost of production and transportation (in facilities for handling, storage, wharf and other port charges), inures to the benefit of the State and its producers, and will go far to help them meet the competition in foreign markets. Every convenience that can he afforded to get our products into the ships, and also to the ships themselves (which are to carry them away or bring back their returns), is a profit which goes directly into the pockets of the producers.

So, also, if we furnish better and cheaper facilities to the trade of our neighboring nations in the Pacific, we shall induce the trade of these countries to pass through our port, to the direct and indirect advantage of our people. As commerce has created these new lands on the water front, they should not be sold hy the State to individuals, but be reserved and sacredly appropriated to commercial uses forever.

These lands are not needed for such purpose to any great extent, but as our State and cities grow, the purposes for which different portions of them will be most useful will develop gradually, and a continuance of the wise policy which has reserved them will assign to each portion its

proper share in serving the great commercial needs of the mstropolis of the Pacific coast.

Education.

The public system of education will demand at your hands much earnest and careful consideration. The framers of the Constitution of our State declared a general diffusion of knowledge and intelligence to be essential to the preservation of the rights and liberties of the people. Whatever power governs the schools, shapes the intelligence of the generation. The destinies of a republic rest upon an intelligent suffrage, and the intelligence of the suffrage depends mainly upon the public school system. The changes in the system made necessary by the new Constitution presents an opportunity of a general review of the existing system, and such wise reconstruction and improvement as experience may have suggested, or patient and earnest consideration may develop. A republican government will always be a perfect reflection of the true character of its people, and if we would attain that "righteousness which exalteth a natioo," and avoid that "sin which is a reproach to any people," we must become, in its best and truest sense, an educated people. Liberty will not decay so long as government is controlled and directed by virtuo and intelligenco, and in a State like ours, where the people are the source of governmental power, general education is the only means by which we may hope to transmit the free institutions under which we live in full vigor to succeeding generations. To neglect or abandon our system of public education is a surrender to the ignorance and vice which usurp the reins of government when virtue and general intelligence are weakened or decay. Educate our people, and the liberties we enjoy will remain unshaken by the assaults of insiduous usurpations and undiminished by the flight of time.

The State University is the crowning glory of our educational system. The new Constitution wisely provides for its continuation as a public trust. By the terms of that instrument its government is to be perpetually continued in the character proscribed by the Organic Act, passed March 23, 1868, and the several Acts amendatory thereof. It is now subject only to such legislative control as will insure compliance with the terms of its endowments. It is further provided that the funds derived from the sale of lands donated to the State by the Government of the United States shall be invested as directed by the Acts of Congress, and the interest accruing shall be devoted to the maintenance of a College of Agriculture, where such branches of learning as relate to scientific agriculture shall be taught. It will be the high privilege of this Legislature to devise the necessary details of legislation by which the object of the original grant or donation to this State shall be carried into execution, and I am happy to believe that this responsible duty will be esteemed a sacred privilege, and the obligations imposed will be discharged with that conscientiousness a true appreciation of the moral grandeur of the subject inspires.

Conclusion.

At the threshold of the administrative duties into which by these ceremonies I am being inducted, I am conscious of a most earnest desire to discharge them as in the high court of truth, honor or justice. To achieve the distinction of an honorable position in the State may be the goal of self-love and pride; to rise equal to the high prerogative by the conscientious discharge of its duty is the more worthy aspiration of ambition. For the brief term I shall enjoy the honors and bear the responsibilities of this exalted office, I trust that my every thought shall be directed to the welfare of the State, and my every effort devoted to the promotion of peace and prosperity, the establishment of good government and the advancement of Christian civilization.

The Indiana Mine.

The Inyo *Independent* furnishes the following description of the Indiana mine, which is situated about three miles west of Owens lake, in the Inyo mountains, at an elevation of 1,500 feet above the lake:

"The country lying to the east of Swansea is attracting considerable attention, and having in view its future importance, we devote some space to what appears at present to be the best developed and so far the most productive property.

"The central vein cuts through a long hill of solid and apparently primitive formation. Its course is north 10° west. On the west the country is quartzose and black slate; on the east the mineral zone is confined by lime, greenstone and slate strata. In the canyons, on either side, are shown small veins of argentiferous rock tending to a common center somewhere on the principal line of location. The Indiana was discovered some 18 months ago by James Hauger, and in April last purchased by Boley & Tuttle, who have since made the property pay its purchase money and all expenses. The vein is a small one, standing nearly vertical, of a width ranging from 4 to 18 inches, perfectly continuous and well-defined. The ore is of sulphide and gray carbonate, the first class carrying 800 ounces silver per ton, the second 400 and the third 100. A specimen on exhibition at the San Francisco office, which weighs 12 pounds shows horn silver and sulphides, and is estimated to contain $60. With a force of four men a tunnel has been run on the line of the vein 230 feet in length, attaining a depth of 115 feet. From this level two winzes have been sunk to a depth of 85 feet, and (at the time of our visit) 18 feet showing very rich ore in all and presumably a block of it 85x140 feet. On the dumps were four tons of second and six tons of third-class ore, the whole assaying from $210 to $380 per ton, which is now at the New Coso furnace in Darwin for reduction, where Mr. S. D. Woodhull, of the Independence assay office, has gone to deliver and sample the same. The extensions consist of claims of the legal length of 1,500 and comprise, 1st—the Virginia, adjoining which comes the Marx Stemler. Finding a vacancy here on the lode line, Capt. J. M. Keeler located and owns the Grand Center, comprising 1,320 linear feet. Next adjoining is a claim belonging to Thos. Moran, upon which he has run a tunnel 40 feet in length showing ore of the same rich class. The Flagstaff mine, the property of C. Meysan & Co., is the next location. This is developed so far by a shaft 110 feet in depth, and has upon the dump 15 tons of $300 ore. Ore sent to San Francisco from this mine has well repaid all the cost of extracting and shipment. A claim of Geo. Desalier, Stone & Co. comes next, followed as you ascend the slope by locations more or less opened, belonging to Jas. Hanger, J. H. Dodge and C. Meysan, and one called the North Discovery, owned by Col. Boley. For all this long line, comprising over 13,000 feet, the ledge is distinct and the ore assays hold the same high average. Certainly, 'there is something in it.'"

Useful Information.

The observation of the circulation of the blood in living creatures has always been regarded as the most interesting and instructive sight that the microscope could afford. The delicate membrane of the foot of the frog has hitherto afforded the microscopist the most convenient subject for this beautiful demonstration of Harvey's discovery. Perkinje's experiment, by which an observer is enabled to observe the circulation in his own retinal blood-vessels, has hitherto been the only method known of actually showing the circulation of the blood in the human subject. Dr. Huber, of Greifswald, it may interest our readers to know, has lately described a simple experiment by which it is possible for an observer to see the circulation of the blood in the blood-vessels of another person. Dr. Huber fixes the head of the subject to be examined in a frame not unlike that used by photographers, on which is fixed a holder for the microscope and lamp. He then draws down the lower lip of the subject upon the stage of the instrument with its delicate inner surface upward for inspection, throws a strong light on the same with a condenser, and focuses the microscope, provided with a low-power objective, down upon the delicate network of blood vessels, which can be seen there even with the naked eye. By this simple means the circulation can be observed with the greatest ease and perfection. The value of this novel and beautiful experiment in the study of the abnormal conditions of the blood, presented in various diseases, it is anticipated, will be very great, and important results are expected to flow from it. Huber distinguishes his new process by the terrific name of "cheiloangioscopy."

Incendiary Silks.—The danger of spontaneous combustion, to which weighted silks are liable, during transportation, has lately been forcibly demonstrated in the case of the steamship *Mosel*, which mysteriously took fire recently in mid-ocean. The fire was fortunately discovered and extinguished. On reaching her destination, a careful investigation afforded unmistakable evidence that the fire had originated spontaneously in certain silk goods that had formed part of her cargo. Samples of the silk, under the microscope, presented a remarkable appearance. The fibers ran very irregularly, and were partly covered with scales of a metallic luster, while on other fibers, heavy, sponge-like knots of a dark color were observed. A chemical examination revealed the following remarkable results: One hundred parts of the silk were composed of pure silk fiber, 21.34%; oxide of iron, 13.45%; moisture, 9.15%; fatty oils, 1.85%; organic dye-stuffs and coloring matters, 50.90%; mineral matters not determined, 3.30%. For each part of silk fiber, therefore, it was shown, 0.75 part of oxide of iron and 2.50 parts of coloring matters were used.

Hard versus Soft Water.—Dr. Tidy, an English chemist, gives, in the London *Medical Examiner*, the results of his observations on the use of hard water for culinary and domestic purposes: 1. Hard water is the best dietetically, because of the lime. 2. It makes better tea, although not so dark colored, owing to the fact that soft water dissolves the bitter extractive matters which color the tea, but ruins the aroma. 3. It relieves thirst, which soft water does not. 4. It does not dissolve lead or organic matter, which soft water does. 5. It is generally good colored, soft water being, as a rule, dark colored and unpleasant looking; hence, in places like Manchester, supplied with soft water, they always put it (in hotels) in dark bottles, to hide the color. A soft water, however, is a better detergent, and requires less soap. For a residential town a water which has over 10° of hardness would be best. For a manufacturing town a soft water would be the most advisable, for commercial considerations only.

For Cleaning Kid Gloves.—Among the many methods for cleaning kid gloves, the following may be given: Put them together with a sufficient quantity of pure benzine in a large stoppered vessel, and shake the whole occasionally with alternate rest. If on removing the gloves there remain any spots, rub them out with a soft cloth moistened with ether or benzole. Dry the gloves by exposure to the air, and then place smoothly between glass plates at the temperature of boiling water until the last traces of benzine are expelled. They may then be folded and pressed between paper with a warm iron. Another way is to use a strong solution of pure soap in hot milk beaten up with the yolk of one egg to a pint of the solution. Put the glove on the hand and rub it gently with the paste, to which a little ether may be added, then carefully lay by to dry. White gloves are not discolored by this treatment, and the leather will be made thereby clean and soft as when new.

Firearms frequently burst when the muzzle has been accidentally closed with earth, snow, etc. Prof. Forbes' explanation of this fact is very simple. If the charge moved slowly, a very slight pressure of the air in the barrel would be sufficient to clear the muzzle, but as the charge actually travels with a speed greater than the velocity of sound, the resistance offered by the obstacle becomes excessive and the gun bursts. It has been demonstrated mathematically that the pressure generated by a plug of the density of air is seven and half tons.

Composition for Pool Balls.—A good and inexpensive composition that would be hard enough for pool balls may be made as follows: Melt together over a gentle fire in an iron pot, pitch 1 part, gutta-percha 2 parts, orange shellac 5 parts; add to this 6 parts of white lead (lead carbonate) in impalpable powder, and stir until a perfectly homogeneous mixture is obtained, then cast and turn out. Color with the aniline dyes mixed with dilute alcoholic solution of bloached shellac.

Cement for Leather Belting.—One who has tried everything says that after an experience of 15 years he has found nothing to equal the following: Common glue and isinglass, equal parts, soaked for 10 hours in just enough water to cover them. Bring gradually to a boiling heat and add pure tannin until the whole becomes ropy or appears like the white of eggs. Buff off the surfaces to be joined, apply this cement warm, and clamp firmly.—*Amateur's Handbook.*

A dry coating for basement walls may be made as follows: Take 50 pounds of pitch, 30 pounds of rosin, 6 pounds of English red, and 12 pounds of brickdust. Boil these ingredients, mix them, and stir them thoroughly, then add about one-fourth the volume of oil of turpentine, or enough to make it flow easily, so that a thin coating may be laid on with a whitewash or paint brush. Walls thus coated are proof against dampness.

Good Health.

Sprains.

Or strains of the joints are very painful, and more tedious of recovery than a broken bone. What we call flesh is *muscle;* every muscle tapers down to a kind of string, which we call cord or sinew. The muscle is above the joint, and the sinewy part is below it or *vice versa*, and the action is much like that of a string over a pully. When the ankle, for example, is *"sprained,"* the cord, tendon, or ligament (all mean the same thing) is torn in part or whole, either in its body or from its attachment to the bone, and inflammation—that is, a rush of blood to the spot—takes place as instantly as in case of a cut on the finger. Why? For two reasons. Some blood-vessels are ruptured, and very naturally pour out their contents; and second by an infallible physiological law, an additional supply of blood is sent to the part to repair the damages, to glue, to make grow together, the torn parts. From this double supply of blood the parts are overflown, as it were, and push out, causing what we call *"swelling"*—an accumulation of dead blood, so to speak. But dead blood cannot repair an injury. Two things then, are to be done, to get rid of it, and to allow the parts to grow together. But if the finger be cut, it never will heal as long as the wound is pressed apart every half hour, nor will a torn tendon grow together if it is stretched upon by the ceaseless movement of a joint, therefore, the first and indispensable step, in every case of sprain, is perfect quietude of the part; a single bend of the joint will retard what Nature has been hours in mending. It is in this way that persons with sprained ankles are months in getting well. In cases of sprain then, children who cannot be kept still, should be kept in bed, and so with many grown persons.

The *swelling* can be got rid of in several ways; by a bandage, which, in all cases of sprain should be applied by a skillful physician—otherwise mortification and loss of limb may result. A bandage thus applied keeps the joint still, and keeps an excess of blood from coming to the part, and by its pressure, causes an absorption of extra blood or other extraneous matter.

Another mode of getting rid of the swelling is to let cold water run on the part injured for hours.—*Journal of Health.*

What is a Cold?

On a less authority than the London *Lancet* would the theory be credited that the resolve of a person not to take cold is ample protection against having one. "It is startling to discover," says the *Lancet*, "how little we know about the commoner forms of disease. For example, a 'cold.' What is it? How is it produced, and in what does it consist? It is easy to say a cold is a chill. A chill of what part of the organism? We know by daily experience that the body as a whole or any of its parts may be reduced to considerably lower temperature than will suffice to give to man a cold if the so-called chill be inflicted upon the surface suddenly. Is it then the suddenness of a reduction of temperature that causes the cold? It would be strange if it were so, because few of the most susceptible of mortals would take cold from simply handling a piece of cold metal or accidental contact with ice. The truth would seem to be that what we call cold taking is the result of a sufficient impression of cold to reduce the vital energy of nerve centers presiding over the functions in special organs. If this be the fact, it is easy to see why nature has provided the stimulus of a strong fit of sneezing to rouse the dormant centers and enable them at once to resume work and avoid evil consequences. This explains why the worst effects of cold do not, as a rule, follow upon a 'chill' which excites much sneezing. Shivering is a less effective convulsion to restore the paralyzed nervous energy, but in a lower degree it may answer the same purpose. The shivering that results from the effect of a poison on the nervous centers is a totally different matter. We speak only of the quick muscular agitation and teeth chattering which occur whenever the body is exposed to cold and evil results do not ensue. It follows from what we have said that the natural indication to ward off the effects of a chill is to restore the vital energy of the nerve centers, and there is no more potent influence by which to attain this object than a strong and sustained effort of the will. The man who resolves not to take cold seldom does."

Crude Petroleum as a Remedy in Consumption.—Dr. M. M. Griffith, of Bradford, Pa., reports some astonishing results obtained by the administration of crude petroleum to consumptives. He claims that out of twenty-five cases of well marked tuberculosis so treated twenty are to all means of diagnosis cured; the rest have been materially benefited; and none have been under treatment more than four months. The nausea attending the use of ordinary crude petroleum led him to adopt the semi-solid oil that forms on the casing and tubing of wells. This, made into three to five grain pills by incorporating any inert vegetable powder, was administered from three to five times a day in one pill doses. This first effect, he says, is the disappearance of the cough; night sweats are relieved, appetite improves, and weight is rapidly gained. It is to be hoped that Dr. Griffith has not mistaken some self-limiting phase of throat or bronchial disorder for true consumption of the lungs; also that continued trial of the alleged remedy will justify the high opinion he has formed in regard to its efficacy.

Dangerous Curiosity.—It is the most natural thing in the world, when you have gone to bed, to get up, run to the window, hoist it and look out at an alarm of fire or any unusual noise or clamor going on outside. A lady was roused from her sleep by a cry of "fire;" her chamber was as bright almost as day when she opened her eyes. She went to the window, and soon saw that it was her husband's cotton factory. She felt on the instant a shock at the pit of the stomach; the result was a painful disease which troubled her for the remainder of her life, a period of nearly 15 years. A young lady just budding into womanhood was called by the sound of midnight music to the window, and in her undress leaned her arm on the cold sill; the next day she had an attack of inflammation of the lungs which nearly killed her. She eventually recovered, only to be the victim of a life-long asthma, the horrible suffering from the oft-repeated attacks of which, during now these 20 years, is the painful penalty, to be paid over and over again as long as life lasts.

Digestion is a complex act. Meat is digested in the stomach; feculas, already modified by the saliva, achieve their transformation in the intestines, while fatty matters are only digested in the intestine. Hence the explanation, why some persons can digest meats and eggs without difficulty, while their stomachs are rebellious to feculent and fatty substances. Individuals on the other hand, who cannot eat veal, can partake of fatty preparations and pastry without inconvenience. Thus each organ has its role, and on their state of health depends the integrity of digestion. Inhabitants of cities suffer most from dyspepsia, that is, from an alteration of the digestive ferment.

Nearsightedness and the Color of the Eyes.—M. Nicate stated, at the meeting of the French Society for the Advancement of Science, that as one of the results of his examination of 3,434 eyes in relation to myopia, at Marseilles, this defect was observed far more frequently in light than in dark eyes, blue and gray eyes furnishing 18%, and black and brown eyes only 11.27%.

MINING AND SCIENTIFIC PRESS.

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The Week.

The wintry character of the weather has passed away, and we are now enjoying a spring-like mildness with bright sunshine. There is hut little animation in mercantile circles, with no outlook for immediate improvement. Every body is hoping and waiting for prosperous times. The mines are shipping ahout the usual amonnt of hullion, and should he appreciated as being our main reliance for coin during this stagnation in all other matters. New mines are being discovered and opened, and through this source comes a ray of promise for the improvement in the future. The rains have thus far heen ample to eecure good crops in the coming season, and this, in combination with our mining yield give promise of hetter times, but not soon enough to avail for present wants. Assessments are now more plentiful than dividends, hut we hope they may cause a turning of tbe ecale when the work they are to pay for is accomplished.

The Legislature now in session bas so far not produced any striking results of henefit to the community, and consequently not of much profit to themselves.

The great item of interest was the eclipse, which caused much comment, and set many to looking heavenward, whoee gaze is seldom turned thitherward. The sky was propitious for a clear view of the pheuomenon, and it is to be hoped that the anticipated results from the accumulated observatione of scientists when made known may add greatly to our knowledge of solar and lunar matters.

THE laying of the corner stone of tbe new Masonic Temple was celehrated last Saturday at Oakland.

R. J. BARNET, an ex-Justice of tbe Peace, killed himself in San Jose last Thursday evening.

SINCE the 8th instant the fighting hetween the Alhanians and Montenegrins hae heen inceesant.

HON. EUGENE FAWCETT, Superior Judge, died suddenly at Santa Barbara Friday morning.

"Vapor Assays."

In a report on some mines situated in the Coast range of Marin county, some statements ars made with reference to assays, which have excited soms discussion among the assayers of this city. Ore from the locality mentioned tested hy Wm. Gardnsr, assayed in gold and silver $36 per ton, and assayed hy J. H. McCrorey $96.61 per ton, hoth lots heing from 700 pounds crushed and sampled hy Mendheim and Hofmann. Mr. C. H. Swain, who made the report on the properties referred to, says: "A vapor assay made by an entirely uew discovery shows wonderful and startling results, which I need not refer to here, as any of the other assays show sufficient gold to pay well for working the ore."

In a supplemental report this gentleman says: "There having heen eome difference of opinion among assayers and others as to the value of ores from these mines, and for the purpose of satisfying myself hefore allowing my report upon them to be distrihuted that they do contain gold and silver in large and paying quantities, I have assayed from one of the sample hottles referred to in my report in two ways, with results as follows:

"No. 1. Treated with chemicals, and after being acted upon for 16 hours, put into a strong fire and partially fused, after which a fire-assay gave:

Gold	$210 95
Silver	5.65
Total	$216.60

"No. 2. Treated direct from same sample bottles with the use of no chemicals, and hy an ordinary hre-assay gave:

Gold	$ 60.27
Silvsr	5.65
Total	$ 65.92"

Such an extraordinary statement would not go unquestioned of course, and the inference is the gentleman was either mistaken, did not know how to make a fire assay, or had made a wonderful discovery—a *reactivo*. And thie is etranger still, when we learn that numerous assays have heen made of ore from the locality in question, hy Mr. Thos. Price, Mr. Irelan and Messrs. Kustel & Riotte, neither of whom have heen ahle to find anything in the rock, or at most hut a trace of silver and no gold; they working of course by ordinary fire assay.

It is argued by those interested in the property that the hre assay will not show the yield of this particular clase of rock owing to the peculiar nature of the rock itself. It is said to be "green" as yet, and not fully formed, and carrying the metal partly in a "liqnid state." The ore is said to carry 13% of moisture, while that from the Sierra Nevada range usually has only 9%. The ore, therefore, to he properly assayed must be prepared hy a peculiar treatment.

We are informed, however, hy a thoroughly competent assayer of thie city that he tested the ore strictly in accordance with the written instructions of Mr. McCrorey, who has devised the new system, and that he failed to get any returns. And this not only with one lot, hut with several different lots, all from the same samplings as referred to ahove. The parties interested, however, maintain that by their new process of assay they can get results far ahove those given hy mere fire assay.

View of the Eclipse from Table Mountain, Fresno County.

[Written for the PRESS by J. W. A. W.]

The Table mountain of Fresno county, very similar in every way to its namesake in Tuolumne county, ie located ahout a mile and a half east of Millerton, former county seat of Fresno, and a mile in the same direction from old Fort Miller. Its northern base extends to the south hank of the San Joaquin river, at the point where that stream makes its exit from the mountaine proper into the foothille of the Sierra Nevada. In all its parte—for though extending on a general level for several miles northwest and southeast, it ie somewhat divided on top hy denudation, though to no great depth—its upper surface is on a general level, embracing eight or ten square miles in area. The hight of this elevated mesa land ahove the old fort, whose strongly-huilt adohe houses and the surrounding land—now the property of Judge Hart—rest in a well protected nook on its northeastern hase, is some 1,100 or 1,200 feet, and at least 400 feet more ahove the eea.

Like the Tuolumne Table Mountain,

It ie capped at several pointe with more or less shattered columns of dark brown trap or hasalt, such as exists in few places in California. This feature, and its extremely flat surface, make it a conspicuons ohject from many points on the San Joaquin plains. From its northern points, a remarkably fine view is had of the river at least 12 miles westward, as its hroad and glittering waters hasten in their winding course through low hottom lande hounded by high hluffs to the vast level valley to which it gives its name. The view to eastward is still wilder, and truly grand, as the eye followe the stream for ten miles ahove Millerton, in its oddly serpentine course in a deep gorge where the river hed is quite 1,000 feet helow you, until it is lost to view among the higher ridges which rise as if in tsrraces, one ahovs another, until from 50 to 55 miles distant the great summit ridge of the Sierras is distinctly ssen, its passes over 10,000 feet high, its peaks over 13,000, all alike at this season covered with a dense white sheet of snow, that extends far down among the pine-clad sides of the lower ridges.

Prof. Davidson having shown in his valuahle paper on the total solar eclipse of January 11th that

Its Central Line

Would pass directly over Millerton, your corrspondent selected one of these points of Tahle mountain from which to view the various interesting phenomena of so rare an event as a total eclipse of the sun. This choice was made especially, that the attractions of fine mountain scenery and a good visw of the movement of the dark shadow of the moon, fromsouthwest to northeast over some 115 miles of its course from crest to crest of Coast range and Sierras, might he added to the usual features of such ohscuration of our source of light and heat.

On Time, as They Always Are,

The sun and moon hegan the performance, at Tahle mountain, not far from 2h. 50m. The total eclipse occurred about 3h. 57m.; the end ahont 5h. 4m., or a few minutes after sunset, for we distinctly saw that the northern limh of the eun was slightly eclipsed to the left as it sank below the Coast range mountains which here bound the western horizon and have ahout twice the altitude of our point of obsservation.

By 3:40 P. M. the darkness had so increassd that the whole scenery of mountain and valley was covered with that greenish light peculiar to solar eclipses, and a few minutes later all shadows gave out a weird appearance, fringed apparently with a faint halo. The lowing of cattle on the surrounding hills gave evidence of the usual impression on them.

At last an intense darkness over San Joaquin valley to the southwest showed that the line of totality had reached there. All at once

A Broad Spot of Inky Blackness

Rested a few seconds on the Coast range monntains and then hegan its steady sweep across the plains toward us. The glimmering reflection on the river's glassy surface, which continued to show faintly in the preceding twilight, suddenly disappeared and the moon's dark shadow was upon ue. On hoth sides of the penumhra, a dim twilight appeared, brightening gradually towards the north and south. The impression produced by this regularly moving shadow can never he lost through life. The stillness was profound. Not a hreath of air was stirring, hut the atmosphere was evidently chilled. The thirty-five seconds of totality allowed but little time for ohservations. But there was the dark round figure of the moon, snrrounded by a heautiful corona, uniform in width and brightness, and reminding one in tint of the

Whitenees of the Electric Light.

Next we looked for the five planets that were to he visihle. There were Jupiter, Saturn and Mars, to eastward in the order named, the first perhaps 35° from the sun; the second some 50°; the third 75° or more. But to westward where Mercury and Venus were to he seen, enough white clouds had formed to ohscure the field of vision, and we could see none but the three planets named—evidence of a rather hazy atmosphere. Indeed, immediately after sunset, the eky was suddenly overcast with dark clouds which would have entirely hidden the eclipse, had they come an hour or two earlier. No sooner did the narrow, distinct, not flickering line of the sun appear on its lower limh, than we could see the dark shadow move rapidly eastward, across the mountains, until it passed over the snowy summit and was lost to view forever. Slowly, as

The Genial Light and Heat of Old Sol

Had left us, it returned to its normal condition, hefore snnset, to the evident surprise of animated nature, and certainly to the delight of man. Thus ended one of those grandest phenomena of nature, such as is rarely seen more than once in a lifetime hy any one human heing. It is worth recording, that the naked eye revealed no indioations whatever, from our point of observation, of the coruscatione of light and other phenomena, known as Baily's Beads—a fact no douht to he accounted for hy the extreme calmness of the atmosphere at the time and place, as suggested hy Prof. Davidson.

It is to he hoped that our well equipped astronomers were ahle, from their high point of ohservation in the Santa Lucia mountains on the coast, to arrive at a nearer solution than ever hefore of the existence or non-existence of the Vulcanites, and similar prohlems of interest in their exact and instructive science.

IN the State Assemhly, on Saturday, the first hill of the session was passed—an act repealing the so-called "Rogers Act," in regard to Water Commissioners. There was a long debate, hut only one vote against the hill.

THE capital of the Giant Powder company has heen doubled, and the dividend on the new etock of 75 cents per ehare is equal to $1.50 on the old stock.

FRANK LESLIE, the publisher, died at New York last Saturday.

On Tempering.

[Written for the PRESS by R. GRIMSHAW.]

There are soms recently discovered facts conerning tempering which are not as widely known as their interest and importancs should demand. These facts relate to the temper, use and working of steel; and curiously enough they all have been discovered hy analogy from exprriments made with *glass*.

For a long tims it was not known that tempering gave steel anything more that a hardness and elasticity greater than untempered metal. But later it was noted that in tempering, steel loses its crystalline structure to take a confused and irregular arrangement of particles, a sign of increassd power of resistance to rupture. Crystalline hodies are easily hroken hetween the crystals. We may say that tempering, while entangling and compressing the amorphous (that is, uncrystalline) molecules, gives to the hody a much greater tenacity.

Caron likened tempering to the action of hammering or hot-forging, operating on the central nucleus hy the contraction of the quickly cooled exterior layer. Sudden cooling hinders crystallizing (just as agitation does in an alum solution) and causes compression and coudensation. This is proved at the great steel works of Creusot, where targets of tempered steel show the interior layers to he compressed while the outer ones are *extended* under the effort. An oil or water hath will shrink masses too large to he compressed by hammering. Tempering resemhles long-continued hot-hammering, also, in taking away the large crystals. Cooling under pressure does tbe same thing.

A series of important experiments were made hy Mons. Leger, to see whether *form* had any influence upon the internal qualities of hodies to be tempered. These studies were best made with glass, in which not only the elasticity and sonorousness, hut the tenacity, is quintupled hy tempering; while in steel the increase is only one-half. Glass has this advantage, that any etate of contraction or dilation is clearly shown by polarized light. Through a Nicol prism parts in tension show iridations or milky streaks. A tempered plate presents a wrinkled appearance. Leger has shown that the same iridescent figures and waves are produced in tempered glass, and hy compressing a similar piece of ordinary glass. Polarized light, passing parallel to the axis of a tempered glass, solid or hollow cylinder, shows concentric iridescent circles, with a crose either black or white, as the diametral plane of the polarizer makes 180° or 90° with the analyzer. Rotating changes the crosses to hyperbolas. (Fig. 1.)

Centrally compressing an untempered cylinder, hy either a hlow or a steady screw pressure, we get the same spectra. Shifting the pressure to one side, the circles *ovalize*, and near this point. The same result is ohtained hy reversing—that is, heating and suddenly cooling *the center*.

To prove that the rings are caused hy the exterior layer of the tempered oylinder, cut away enough stuff to leave only a square or polygonal prism, and the iridescence is shown to he a square or polygon, having its points of greatest compression at the angles. (Figs. 2 and 3.)

Compressing an untempered cylinder at a diameter shows a douhle series of iridescent ellipses all tangents to each of the pressure points—the system snrmounted hy a dark Maltese cross, and surmounted hy a milky ellipse, as long as the pressure diameter and half as wide. (Fig. 4.)

Compressing the same cylinder in two diameters at right angles, this last system douhles up symmetrically. (Fig. 5.)

If a tempered square plate or prism be examined it will show at the four corners strongly iridescent "peacock'e eyes," reaching farther or not so far across the diagonals, according to the temper. From one angle to the other, along the sides, are iridescent archee or festoons convex centerwards. Following the two diameters normal to the sides, is a cross which is white or hlack according to the angle of the polarizer. The squares between the "peacock's eyes" and the side arches and the cross are milky. (Fig. 6.)

A trapezium gives a spectrum merely modified according to its exterior form. (Fig. 7.)

Just in proportion as one heats (and thus expands) the center of an untempered plate, the dark cross and the milky squares develop.

To get the same effects hy artificial, that is, mechanical compression, Leger tried many experiments. In all these the "peacock's eyes" developed at the points of great pressure, and the neutral areas where the pressure did not extend were very clearly defined.

The shorter axes of the ellipses always lengthen with the pressure, proving the latter to extend further, laterally; but rupture always takes place along the longer axis.

To explain these images, one may say that two equal forces acting in opposite directions transmit their action from one to the other across a more or less elastic hody, the areas acted upon heing ellipses longest in the direction of the two forces. When there are irregularly placed points of pressure, the force lines are seen plainly curving.

In all the polarized images the iridescent and milky parts appear to indicate molecules compressed or dilated in every direction. The dark lines indicate compression in one direction and expansion in anotber. Fissures or cracks gen-

erally follow these dark lines, and scales detach themselves along the lins of the most lively iridescences.

Tn get by the compression of a square of untempered glass the same spectrum as a tempered sqnare gives without compression, it must bs uniformly pressed along the sides, and also diagonally. This shows that tempering acts liks a perfect exsternal compression. Expausion hy heating gives polarized tempering figures with nrdinary glass, aud ono can also reproduce them by properly directed external pressuro.

Experimenting with blocks of all sections, ws find iu general at ths snmmits or ponts of greatest teusion peacock's eyes of lively irisations, with hatchiugs of milky light. From one tip tn another, like side arches, iridescent festoons more or less convex. Dark branches, always derived from the hyperbola, and sep arated by milky fringes, leave the csntral nnclens and recut ths sides.

If a tempesd bar bs cut in sliccs, each fragment will present, in face and profile, spectra similar to thoso of the entire bsr, although loss vivid; jnst as in a magnetic bar eacb slice would be a perfect, though weaker magnet. If the body be transformed lengthwise by grinding, turning, filing, milling, etc., it is the samc; but if the uew section be dissimilar from the first, there will be partial fogs ou the spectra.

To study the true polarized spectrum of a given form, it must, then, be certain tbat the body was tempered in that form.

Bodies made from othcr tempered forms do not, after great reheating and new tempering, show the spectra of the first form—showing, also, how difficult it is by any exterior heating to thoroughly *untemper* a body; to destroy in the whole mass a state or a molecular arrangement once acquired.

Thie brings us to an important question: The importance of tempering after shaping, whcn the molecules, coming from the pasty etate, submitted without cees to successive hammerings or reheatings, have kept their amorphoue stato clear into the center, and offer themselvee to thc action of tempering, more malleable and moro homogeneous than they will be fonnd again after some of the particles have arranged themselves in crystals. Why is it that tempering rounds both salient and re-entrant angles?

If we imagine a layer of molecules equidistant from the outer layer of a tempered prisms we will lind that all the particles except those at the corners are heated on one-half and cooled nn the opposite. But those at the corners are cooled over tbree-fourths and heated from one-fourth nnly; hence are *driven* in by the outer laysrs. In the case of a T piece, the molecules in the re-entrant angles are heated along three-fourths and cooled over one-fourth only; hence they are driven *outwards* from the hot nucleue and the angle rounded in this case too. (Figs. 8 and 8.)

A cylindrical bar has its plane bases changed to spherical segments in tempering. A tempered hollow cylindrical has all its edges rounded, and if very thick, the bore ie "hour-glassed." (Figs. 10 and 11.)

If we were to temper a cylinder in the solid, and then bore it (and impractical case) the hore would have met the stratified layers towards the base, perpendicularly, or at a great angle, which would have caused a lack of cohesion particularly dangerous in certain applications.

The rounded hases modified hy tempering, with their discordant stratification, are not as strong as the greatly compressed parallel layers, and in instances where there was need of extreme resistance at the ends, it would be prudent to turn or grind off all those parts weakened by this discordance, and to present the plane base, where all the layers being concentric, are firmly held together. The grain would be finer and the material stronger from this oause.

A ring, as a fillet on the face of a cylinder, disturbs stratification in tempering and may actually cause that degree of weaknese which it was placed to prevent.

It is very difficult to heat the central portion sufficiently to destroy its crystalline structnre, once acquired, without melting the layers. In the reheating furnace, as in the tempering hath, it ie often neoessary to turn the pieces on their axes and cnd for end. Without this, the side turned towards the arch or the hearth, that next the door or the bridge, would present great differences. Also, during tempering, the lower side is much more energetically cooled than the upper, on account of the upward direction of the ascending current of liquid.

The supports, during tempering, exert a considerable influence, according to their specific heat, and whether or not they prevent the transmission of heat or the circulation of the cooling bath.

There is shown in tempering anotber molecular arrangement, only appearing with excessive temper.

DeLuynes remarked that the familiar "Rupert'e Drop" would, if sawed across its equator, separate into two portions terminated by cones. Sections to right and left of this line also gave conical terminations, but pointing to the center of the drop. The same disposition of symmetric cones was found in a bar of tempered glass.

Leger observed the same law and the same pointed fractures in tubes, flasks, bottles and sheets of tempered glass broken by over-flexion.

Bars of hard tempered glass, breaking spontaneously, show not only conical fractures in the central nucleus, but a fibrous texture in bnnches of needles converging towards the apex of the cones. Bars of certain tempered steel, tested for teusils strength, show ths same conical fractures and silky surface. This is because each molecnls was, in cooling, pushed towards the bars, and also towards the center of leugth, the resultant being these cones of fibers. The acuteness of the eono will depsnd on the proportions between the two forces, and hence upon tbs proportions nf the bar.

We may conclnde by saying that glass, cast iron and steel have comparabls aspects under fracture. Tempering hrings steel from coarse grain and large crystals to fins grain and that silky textnre spoken of by Chernoff, which is caused by tbe molecules being welded togsther.

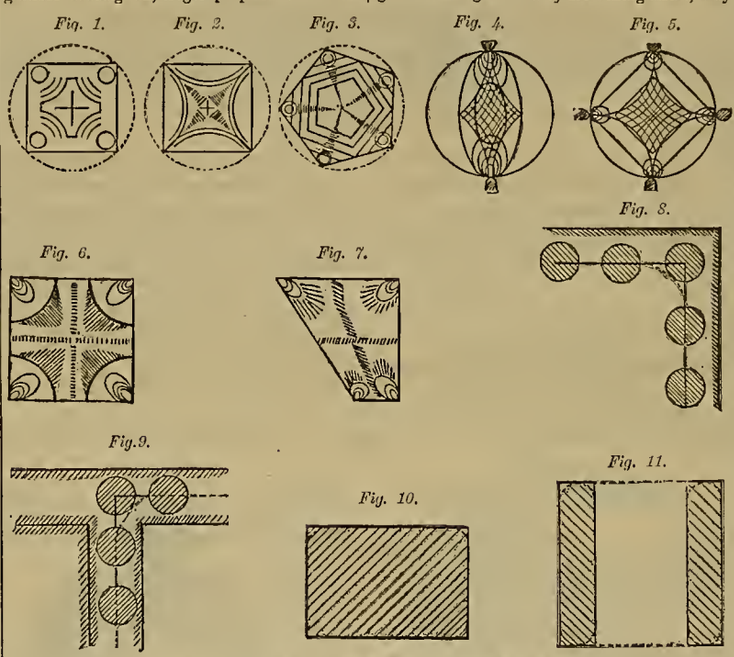
Elasticity, tenacity and sonority develop by temper the same in glass and in steel.

Under the same conditions, sonorons vibrations, on either a glass plats or a steel disk, affect the molecules the sams and maks the same nodal lines. Why would not mechanical vibratious affect tbs ons exactly as tlie othsr?

As a general precantion, expcriencs with glass shows, by analogy, that to get the effect of temper with the greatsst security, *tempering of steel must be done after all shaping or other working*—after casting, forging, or continual hammering, and at least after superficial heating of the envelope cooled by radiation and by contact with the air.* If it bo necessary to completely reheat the mass, it must he donc gradually and eqnally; and to avoid quick separations between the nucleus and the envelope, to turn the piece ahout, change its points of support, and in any case to make the heat penetrate the mass by hammering; not to temper too many pieces at once and thus cause too quick or too great compression; and to givo every opportunity for gradual cooling off, Legsr proposes to uso an crnss section shonld be elliptical, or rectangular with well roundsd edges.

For swords, bayonets, etc., to resist bending, they should not bs tempered in triangular or cross sections, as that tends to sever the ribs about the central nucleus and simply leave thres or four strips of fibers badly fastened together. It would be better to temper while elliptical, and to mill out the gutters.

And now for pieces destined to receivs great interual pressure, as cannons. There is needed tbe greatest symmetry and homogeneity in the concentric layers, and thns all hoops, fillets, etc., should bs avoided, and thsro should bs left at each end a hemispherical piece to bo cut off later.



STRUCTURE OF STEEL IN TEMPERING.

Active Labor an Evidence of Prosperity.

When the laborsrs ars receiving a fair rate of wages, and ars constantly employed, it may be regarded as a surs evidence of prosperity. Labor, intslligently applied, is ever productivs. Men cannot work with the determination of succeeding in their exertions without producing something which has advanced the value of the crude material employed in their work. When the fiat was uttered that man should earn his hread hy the eweat of his brow, it was not given forth in opposition to the great principle of the value or utility of labor. It was uttered in full accordance with the law that work is productive, and that a just compensation is consequently due to the worker.

As society is now constituted, it is incumbent upon all to be producers. Those who fail in this duty, become a dead weight upon the progress of the age. If they are willing idlers, they auxiliary bath of steam; to commence with an easy temper and work up to a higher.

The supports, in heating or in cooling, should not prevent regular and uniform diffusion of heat, lest they cause deviations of the nodal and isothermal lines and eccentricities unfavorable to durahility.

Ae regards the form of pieces subjected to temper, they should be as free as possible from angles, edges, fillets and grooves, shoulders, sudden variations in diameter or sudden bends. Otherwise there may be expected a weak spot near one of these faults. In a word, the nearer the better the approach to continuous spherical and cylindrical forms, and to pieces made up of these simple geometrical forms, which cause the greatest possihle interior cohesion.

It may be advisable even to give these forms temporarily for the tempering stage; subsequent milling, filing, grinding, turning, etc., will not change the internal grain. It may often be well to lose even the hard outer skin, to get homogeneity and cohesion in the mass. According to the intended use of a tempered piece—whether for shock or for preseure, pulling, hending, twisting, internal pressure, etc., we may look into the influence which the state of the welding can hare.

A head used for percussion should have a hemispherical end or very gradual curves. If sharp edges are wanted, as for a punch, the head can be cut off in a lathe as poor stuff; the good material being exposed behind the base of the hemisphere.

For a graver or chisel, the cutting portion is got by working away four faces from the rounded and tempered end, so as to have the greatest homogeneity possihle with a etraight base. The must, and do, suffer the penalties which slothfulness entails upon its adherents. If they are unwilling idlers—idle because no man giveth them work to do—still the pains and penalties of inertia are attendant upon them. Man must work, or must suffer because he does not. If he is a voluntary idler, though possessed of sufficent means of support, nature inflicts upon him a loss of energy, a failure of health, and, in general, a moroseness of disposition, which embitters his existence. If an involuntary idler, he suffers from the privation which his unsupplied wants create.

The law that man shall work is an inexorable one. It is imperative that he shall find occupation. He cannot escape from its imperious necessity. His own vitality as well as the vitality and welfare of othere depends upon his fulfilling the necessities of his destiny to work. Thou *shalt* earn thy hread, was the dictum of Omnipotence. There was no leniency in the strong decree of justice. The mandate was inflexihle. It must be oheyed.

Still it was not harsh. It was tempered with mercy. It was commingled with blessings, and adorned with good. It was replete with benefits and overflowing with advantages. Prominent amoug the henefits is the prosperity attendant upon active labor, and the healthy condition of the worker. These two leading blessings of the human race would not and could not exist without labor.

The nations that have held the largest corps of laborers have always been the most powerful and the most successful. They have lived up to the requirements of the laws of cause and effect, and have fulfilled the exigencies needed for productiou. Their labor has been materialized into solid wealth. Their wealth has given them power. Their power has produced stability. It is iucumhent therefore upon all governments to foster and sustain the cause of labor, for it ie the basic etratum of their existence.

*Steel, after forging and reheating, if left to itself, "tempers" like glass, but irregularly on account of the air currents. This often causes the fracture of pieces when cold, and from no apparent cause. To get an untempered steel, the mass should be cooled as in a hot sand bath. Inversely, to get a *well* tempered mass, natural temper should be avoided and even neutralized by reheating.

Mining and Opinions Concerning Metals Over two Centuries ago.

It is curious as well as interesting to look back through tbe psges of old authors to the state aud position of mining over 200 years ago, and even back into more remots periods. Some recent iuvestigations which we wers making upon tbe methods of reducing ores, led ns to investigate tbis field of by-gone years, and we were surprised at the similarity then existing on many points which are common at ths presnt day. How earnestly and with whst simplicity, both of thougbt and diction, did thoso old pioneers in miniug express their views. With what commendable brsvity they portrayed their descriptions of the various ores that passed under their observatiou. How wisely cautious wers they in their statemsnts; and, at the samo time, how credulous and superstitious withal. With what implicit faith they dwelt "upponne the subtile essence or spirritte of lifo contaynned in ye unstallc;" and, blending much that is vague and visionary with the limited class of understood facts before them, they present to the mind of the reflecting a lesson of due humility, lest in days to come the opinions now so seemingly true may he known to be weak and chimerical. Many are the pagee they transcribed to prove the existence of a "spiritual substance" from which all metals are produced. They believed that the soul or essence of gold possessed the power or property of transmuting all the more base metals into its own valuable substance. Silver stood next in tbe scale; it could not transmute tbe lower metals into gold, but it could hring them up to its own quality, and all other metals could raiss those below them to their own standard, but could not arise beyond it.

They helieved that the soul or essnce of metals arose in the form of a vapor, sometimes visible, at otber times invisible, and settling upon the sides or in the crevices of the vein, elaborated itself by its vital principlo into a true metal; and that when tbe truo metal was thus deposited, it lost its vital principle and became dead. All substances which had reached their true metallic state, either by natural or artificial means, had lost their vitality. This view they drew from their labors in the laboratory, where the analysis of ores and the reduction of metals was accomplished by the action of heat; and knowing the impossibility of animal existence being maintained in such elevated temperatures, they believed the extreme heat destroyed the vitality of the metals also.

Perhaps a few quotations setting forth the ideas they held, as mentioned above, may not be uninteresting to those who have never met with the ancient tomes, or the views of the earlier writers on mining. First we will open "Metallographia or an History of Metals," by John Webster, published in London in 1671, and passing by the laudatory dedication "To his Highness Prince Rupert, Count Palatine of the Rhyne, Duke of Bavaria, etc.," and glance a moment at the preface: "Courteous reader, expect here no flonrishing frontis-piece to allure to the buying of this untrimmed and unpolished piece; no, not so much as the author's picture, who never yet was so far in love with his earthly tabernacle as to he at the charges to have it drawn or cut in copper. Thine own desire after this kind of knowledge, and the plainness of the subject, are the greatest motives that I have to lay before thee to move thee either to huy or read." With what becoming modesty does he make his bow to the public and to his "courteous reader;" a line of policy from which he quaintly deviates as he progresseth in hie tome: "I very well understand that I shall undergo no emall censure for taking upon me to meddle with such abstruse matters, * * * and however they may censure I shall pass by it, * * * and shall modestly tell them that it is above 35 yeare since I first learned a course of common chymistry under old Johannes Huniades; and have been and am a continual reader of and studier in the best authors that have written in mystical philosophy; and therefore, let none bc too censorious of what I know, or what I know uot, in this abstruse science, but weigh the authorities and reasons that I lay down, and accordingly judge of what I write."

Somewhat of a liberal, too, was he, or would have been termed such at the present day, for he says: "Who am myself no lover of dogmatizing, and have long wished, and am now most glad to see a way set up for the promoting of experimental philosophy, that men's judgments may no longer he fettered in scholastic chains, nor always kept in the prisons of academick opinions."

Josephus Acosta saith: "The wisdom of God hath made metals for physick, and for defence, for ornament and for instruments for the work of man."

The miners of those days had much of the same inherent roguery as ohtains among their class at the present time: "So cunning are the minere that if they find any vein of ore that may contain so much of silver as would make it a mine royal, they will not let it he known, hut presently beat it, and mix it with their softer ore, pretending that one will not melt without

CONTINUED ON PAGE 44.

Bide Your Time.

Every man must patiently bide his time. He must wait. More particularly in lands like my native land, where the pulse of life beats with feverish and impatient throbs, is the lesson needful. Our national character wants the dignity of repose. We seem to live in the midst of a hattle, there is such a din, such a hurrying to and fro. In the streets of a crowded city it is difficult to walk slowly; you feel the rushing of the crowd, and rush with it onward. In the press of our life it is difficult to he calm. In this stress of wind and tide all professions seem to drag their anchors, and are swept out into the main. The voices of the present say—Come! But the voices of the past say—Wait! With calm and solemn footsteps the rising tide hears against the rushing torrent up stream, and pushes hack the hurrying waters. With no less calm and solemn footsteps, nor less certainty, does a great mind bear up against public opinion, and push hack the hurrying stream. Therefore, should every man wait—should hide his time. Not in listless idleness, not in useless pastime, not in querulous dejection; hut in constant, steady, cheerful endeavors, always willing and fulfilling, and accomplishing his task, that, when the occasion comes he may he equal to the occasion. And if it never comes, what matters it to the world whether I or you, or another man, did such a deed, or wrote such a hook, so he it the deed and the hook were well done. It is the part of an indiscreet and troublesome ambition to care too much ahout fame—ahout what the world says of us; to he always anxious for the effect of what we do and say; to he always shouting, to hear the echo of your own voices! If you look ahout you, you will see men who are wearing life away in feverish anxiety of fame, and the last we shall hear of them will he the funeral hell that tolls them to their early graves. Unhappy men, and unsuccessful, because their purpose is not to accomplish well their task, hut to clutch the "trick and fantasy of fame," and they go to their graves with purposes unaccomplished and wishes unfulfilled. Better for them, and for the world in their example, had they known how to wait. Believe me, the talent of success is nothing more than doing what you can do well, and doing well whatever you do—without a thought of fame. If it come at all, it will come because it is deserved, not because it is sought after. And, moreover, there will he no misgivings, no disappointment, no hasty, feverish, exhausting excitement.—*Longfellow.*

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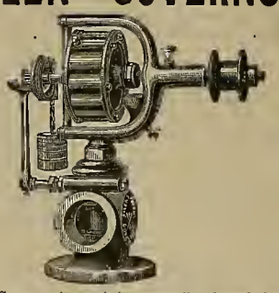

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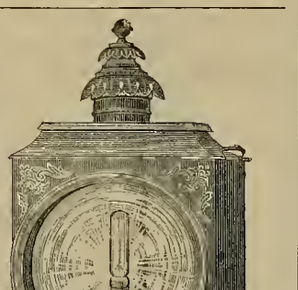

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Ladies who wish to make the skin look beautiful and natural should use PHOSPHATE SOAP.

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TESTIMONIALS.

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A. J. SPENCER, M. D.

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To the Standard Soap Company.

SAN FRANCISCO, July 19, 1879.

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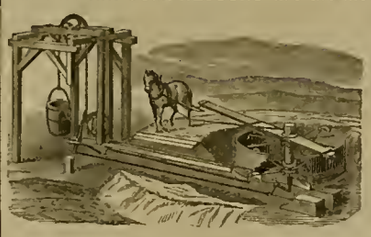

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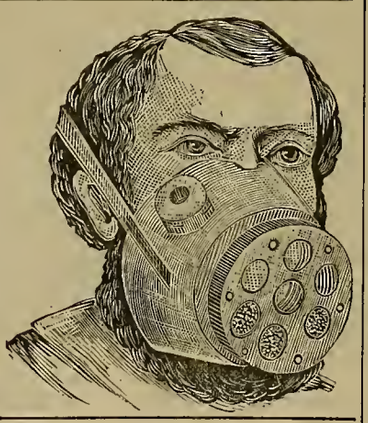
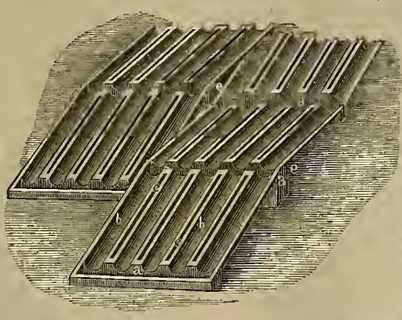


Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

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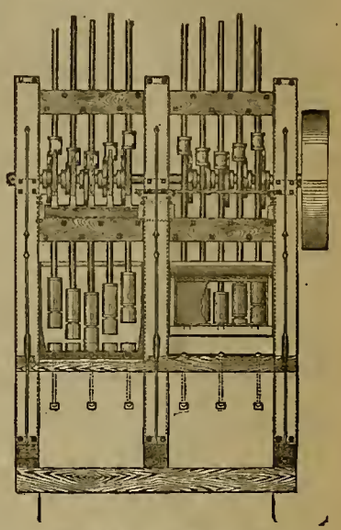

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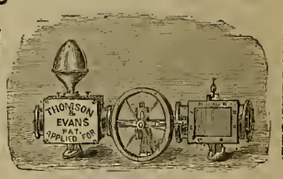

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It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. O. Hoagland, S. & J. Newsom, B. Henrickson.

Mines and Works of Almaden.

Translated from "Annales des Mines"

BY S. B. CHRISTY.

Full geological description of this famous Quicksilver Mine, illustrated by maps and plans of the works. Complete description of the Quicksilver Furnaces and Condensers, etc. 48 pages octavo—paper cover—price (post-paid) 50 Cts. Published and sold by DEWEY & CO., [202 Sansome Street, S. F.

CONTINUED FROM PAGE 37.

of copper on the southeast slope of the Huachucas. The ledge can be traced for 3 miles and is 40 ft in width. Three locations, the Commodore, Jeannette and Bennett have been made. The rock shows native silver all through the specimens, and assays $30 in silver, 65% copper and a trace of gold. Wood and water are abundant and a living spring flows on the ledge. A number of good carbonate ledges are located in this vicinity, but this is the first copper deposit of any extent and value discovered.

On the San Xavier three shafts, 90, 110 and 127, have been sunk, and on the Buena Vista a shaft of 60 ft, showing large bodies of carbonate and galena ore. About 1,200 tons of ore are now on the dumps, and over 300 ft in levels run. Messrs. Gibson & Blade have discovered and located an immense silver ledge in the Sierritas. It is 60 ft in width; there is plenty of wood and water close at hand. Samples of the ore were brought in for assay.

CUSTOM MILL.—Tucson *Citizen*, Jan. 10: Mr. Chas. Isenheck, inventor of the Isenheck process of working ores, has leased Warner's 2-stamp quartz mill, and will commence work on custom ores by his process. He has on hand 3,800 pounds of quartz from the Huachuca. Messrs. Watson & Johnson will bring in 23 tons from their mines on the San Pedro, near old Camp Grant, and Prof. Salazar will have the ore from the Black Metal claim worked soon.

HUACHUCA ITEMS.—*Arizona Citizen*, Jan. 10: The Wisconsin claim, in Ramsey's canyon, Huachuca mountains, is a large vein, carrying Peacock copper ore, which assays from 20% to 50% copper and 35 ozs. silver per ton. A contract is let for 200 ft of shaft and tunnel. At 150 ft the tunnel will tap the vein at a depth of 125 ft. The claim is on the side of the mountain and the ore can be taken out by stoping from the tunnel to a depth of 200 ft, saving the expense of hoisting. There are other claims near the Wisconsin carrying the same character of ore. A tunnel has been run in the Nelly James 18 ft, with good ore on both sides; the ore body is 15 ft in width. This claim produces three varieties of smelting ore, viz: galena, carbonates of copper and gray copper. The yield of the galena is $70 per ton in silver. The carbonates average 60% copper, and $80 to $90 per ton in silver, while the gray copper averages 40% copper and $30 to $195 per ton in silver. The Salinas mine is of the same character as the Nelly James. Work on tunnels and shafts on both mines will be pushed rapidly. There is abundance of pine, fir and oak timber in the immediate vicinity of these claims which will only cost the cutting for smelting purposes. There is also water at the mill site.

COLORADO.

LADY FRANKLIN.—Silver Cliff *Prospector*, Jan. 6: Sulphurets assaying 120 ounces in silver were struck at a depth of 100 ft. The Milk Maid lode, on the same lead, at 60 ft, are drifting for the vein. The wall rock in this shaft runs 23 ounces of silver.

TUSCARORA.—The shaft is down 25 ft. There is a fine body of manganese, with silver-bearing galena. Assays run 18 ounces. This mine is situated one-half mile northeast of Round mountain.

R. E. LEE.—A shaft has been opened 12 ft. At this depth a true fissure vein is disclosed, bearing ore of good character. The ore is iron formation and assays 16% of iron and 26 ounces of silver.

BOUER NEST.—*Register-Call*, Jan. 2: Sinking is progressing on the shaft. It is now 450 ft deep, and makes considerable water, which the pump easily keeps under control. In the east lower drift about 140 ft from the shaft, there is a fine body of ore on which stoping is now progressing. The principal work is sinking the shaft.

FREE AMERICA.—The shaft is 500 ft deep. The bottom is 90 ft below that of the Boulder Nest shaft. It does not make more than half as much water as the latter lode, although there is a comparatively short distance between them. A good vein of ore was recently encountered in the bottom of the shaft, from eight inches to two ft wide of argentiferous galena, carrying white spar, running several hundred ounces in silver.

FREE AMERICA EXTENSION.—This mine is now turning out ore of fair grade in good paying quantities to the lessees, Stevens & Co. They are drifting east about 125 ft from the Free America ground. A mill-run made this week yielded silver at the rate of 150 ounces per ton.

MENDOTA.—The shaft is 63 ft deep. The stope west of the shaft carries a foot of solid ore consisting mainly of galena, and running from 35 to 80 ounces of silver per ton, and from 40% to 60% in lead. The drift immediately east of the shaft carries 6 to 15 inches of scattered and solid ore which appears to be the top of a pocket.

PICKWICK.—The development of this lode near the summit of Saxon mountain, will be fully prosecuted. A tunnel has been commenced on the north side of the mountain which will cut the lode 400 ft deep, at a distance of 400 ft from its mouth. Messrs. McGrath and Hugh have the contract. The tunnel is now in 20 ft. The property is owned by a company from Syracuse, N. Y. Capt. T. G. Cree still retains an interest, and superintends the property. The mine carries rich ore, the lowest run taken out milling 305 ounces of silver per ton. The average is about 1,000 ounces.

TROPIC.—Recent developments on this mine are adding to the value of the property. The ore in the stopes and drifts runs all the way from 2 to 18 inches wide, and is of uniform grade, milling from $80 to $250 per ton in gold, silver and copper.

JOE REYNOLDS No. 3.—Drifting is progressing on the three main levels. Both the upper levels are showing up well in ore. There is nothing in the breast of the lower drift, but the lessees have raised into good mineral from that point. The ore is now becoming more solid, consisting largely of very fine-grained galena and copper pyrites. A late run of ore from Daily & Co.'s ground milled 500 ounces for first-class and 160 ounces for second-class.

PERUVIAN.—The Peruvian is showing up handsomely as development progresses. The shaft is now 75 ft deep, and shows ore all the way down, ranging from 10 inches to 4 ft of a pay vein; consisting principally of bright galena, gray copper and iron pyrites, with some gangue scattered through it. It assays from 50 to several hundred ounces in silver per ton.

MINING ITEMS.—Silver Cliff *Prospector:* The Kohinoor, of Clear Creek, has shown a $4,224-assay. An early opening is predicted for Camp Pitkin next season. The Dunderberg, above Bakerville, is being worked extensively. Judge T. M. Bowen has four men employed on his mines in Summit. Edison made the test for platinum in Decy's new mine in American basin, San Juan. The Stevens mine, near Georgetown, lies at an elevation of 12,500 ft, and is worked all the year round. The Dixie lode, six miles from Idaho Springs, shows a 15-ft crevice of brown quartz sprinkled with gold. The Yankee Doodle mine, on Carbonate hill, has been transferred to the Carbonate mining company for the sum of $300,000. The Michigan lode, in San Juan county, has struck a pay streak of 28 inches, which is yielding gray copper of high grade. The Emma lode property, on Democrat mountain, has recently had a run of ore which milled at the rate of 602 ounces of silver per ton without classifying. Hiram Bragg has completed 150 ft of his contract of 350 ft on the Iowa & Colorado Con. company's mines, in the Summit district.

DENVER.—Silver Cliff *Prospector*, Jan. 7: The Denver mining claim, owned by the Portagee & Colorado mining company, situated within half a mile of the Bull-Domingo, is nearly 100 ft deep and is looking well. They have followed a 10-ft vein of carbonates all the way, which is rapidly changing into fine minerals. The indications are characteristic of galena.

LIMERICK.—The Limerick lode, on the west side line of the Ben Franklin, which has been idle for some time, is being worked, operations having been inaugurated to-day.

KING OF THE CARBONATES.—Work was resumed to-day on the King of the Carbonates, under a 50-ft contract.

BEN FRANKLIN.—Yesterday the valuable mining property at Rosita, known as the Ben Franklin mine, was sold to Chicago parties for $75,000.

MONTANA.

MINING ITEMS.—Butte Mountain *Miner*, Jan. 6: A party of Chinese miners have taken a five years' lease of the gulch, or creek claims, belonging to John B. Sutton, Elias Snyder and others. They are situated on North Clear creek, above the mouth of Missouri gulch. A specification is made in the lease that they can purchase the claims within a certain period of time upon the payment of a stipulated sum. The Chinamen have taken possession of the property under the lease. Jack Needham, one of the old pioneers, on Seaton mountain, Idaho mining district, is in the city. He says that more men are employed in that district than ever before. Work is progressing on the Mack tunnel, which is to penetrate the "true inwardness" of Clifton mountain, as fast as men and means will admit. Ex-Mayor Hartman, of Blackhawk, has a fine vein of ore in the Lucerne mine; the Victor vein, in which he is largely interested, is doing well, as also the Freeman and Franklin and other veins being worked in that immediate locality.

ORO BUTTE.—Late developments are encouraging. A tunnel was commenced to prospect the ground, and at a distance of 90 ft three well-defined veins of good ore were encountered, varying in width from three to five ft. In the largest of these veins, one man with a pick and gads can break down from three to four tons of ore per day. It mills about $35 a ton.

NEW MEXICO.

APACHE TAHOE.—*Grant County Herald*, Jan. 3: Chas. Davis is making preparations to erect a five-stamp mill, to be run by water power. He will purchase ore or do custom work, and as Apache Tahoe is conveniently located either for the Georgetown, Lone Mountain or Silver City mines, we have no doubt that the mill will be kept well supplied. It is Mr. Davis' intention to enlarge if his ore supply warrants, and the buildings will be erected with that in view.

UTAH.

BARBEE.—Silver Reef *Miner*, Jan. 3: The work of rebuilding the mill is progressing. The pan and settler frame are ready for the machinery, the battery is nearly completed, and the boiler and engine have been thoroughly overhauled and put in running condition. The machinery to arrive consists of a mortar, six pans, three settlers, smokestack, etc. If this machinery were on hand to-day, Superintendent W. T. Rich says he could have the mill completed and ready to start up by the 20th inst. He thinks everything will be in place by the 1st of February.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

LAWN SPRINKLER.—Corydon Chamberlain, Santa Rosa, Cal. No. 223,277. Dated Jan. 6, 1880. This invention is called the "Universal Lawn Sprinkler," and it consists in an attachment which may be screwed into the hose pips or nozzls, which attachment is provided with a nozzle and with a swinging arm having a conical circular plate or distrihuter, which disperses the current into spray after it leaves the end of the nozzle. The swinging arm carrying the distributer is moved at will, so that the distributer will produce all the effects produced by the various sprinklers in use. A suitable stand is provided also, upon which ths attachment may rest when used as a fountain, or when it is not desired to hold it in ths band. By the use of this device the whole percentage of the current of which the nozzle is capahle is obtained, since the current is not divided until after it leaves the nozzle. Complete control of the stream is maintained so as to producs seven or eight different effects—full stream, coarse spray, fine spray, etc. All the effects desired or obtained in the various sprinklers are produced in this one device. It cannot stop up with insects or other matter, since all that will flow through the hose and nozzle can pass out.

BALANCE SLIDE-VALVE.—David B. Kimmel, Idaho City, Boise Co., Idaho Territory. Dated Sept. 2, 1879. No. 219,161. This device relates to certain improvements in valves for steam and other engines; and it consists of a novel construction of a douhle slide-valve, having a vertical seat with ports so arranged upon opposite sides that they are controlled by the double valve. The two parts of this douhle valve are united by a frame, so as to move simultaneously, and be actuated hy a single valve stem. This valve is especially fitted for locomotive engines, in which the valves and ports are large, and the valves are subjected to great pressure and rapid motion.

REFRIGERATOR. — Thomas Guinean, Sacramento, Cal. Dated Sept. 2, 1879. No. 219,154. This invention relates to certain improvements in hotel and car refrigerators, and it consists in a novel combination of chambers, with surrounding air spaces or flues and connecting pipes, by which a body of cool air from the ice-receptacle is caused to circulate around one or more containing chambers, which are unconnected with the ice chamber or receptacle so that a body of cool dry air is maintained in these chambers.

HOTEL SERVER.—James G. Tait, Stockton, Cal. Dated Sept. 2, 1879. No. 219,183. The object of the inventor is to produce a convenient tray for the use of waiters in conveying dishes in hotels and restaurants; and it consists of a palette-shaped tray, having a slot at one side to fit the arm of the waiter, and legs, one of which serves as a handle by which to hold and steady the server. A drawer is placed heneath the server in which may be placed spoons, knives, forks, checks, etc.

AN attempt was made in London last Saturday to assassinate the priest of the Halton Garden Italian Church.

INDIANS are fighting the whites in Arizona, and troops have been dispatched to the latter's assistance.

WALLACE R. WHITE, charged with bribery in the Maine bnsiness, emphatically denies the whole story.

Mining and Opinions Concerning Metals Over two Centuries Ago.

CONTINUED FROM PAGE 41.

ths othsr, being with them a common trick, lest their work should he taken from them."

Law suits were common then, as now, upon such mines as the working proved to be rich. "Sir Lewis Bulmer, having brought a mine to great perfection, and getting great store of silver ore, had a controversie ahout the title, that grew to that height that he was forced to give over pursuing the labor, and so caused the workmen to throw in the works. Sir Richard Houghton set up a very profitable 'Mine of Allom,' and his competitors finding be could undersell their 'Allom,' a contention was raised against him about the sams mine, so that he was either compounded with, or otherwise forced to give it over; so that it is now quits left, to the loss of the nation in general and to many a poor man in particular, that got their living by working there."

Ingratitude among the mine owners for services rendered was, as now, not uncommon. One Walter Basley, 76 years of age, whose travels had been multifarious, "was brought down with some Londoners, that then had a patent for mines; * * * they at last desertsd the poor old man, whom I entertainsd for three-quarters of a year."

The minsrs were a migratory class: "For it is usual with the workmen, that if they can hear of another place whers they may find hetter wages, hoth to leave ths work and their masters."

An implicit confidence could not always be placed in the authors of that period: "Though in their writings there bs some things worthy of note, and may much better the understanding of such as be ignoran', if thsy take cars to try before they trust, and not to take everything for a truth that thsy may find in them."

Soms among them were belisvers in the "vegetability of metals"—that is, that metals grow in the earth as vegetables grow in the air. Hear Peter Martyr, Counsellor to ths Emperor Charles V., on this subject: "They have found by experience that the vsin of gold is a living tree, and that the same hy all ways spreadeth and springeth from the root, by the soft pores and passages of the earth, and ceaseth not until it discovereth itself unto the open air, at which time it showsth forth certain beautiful colors in the stead of flowers, round stones of golden earth in the stead of fruits, and their plates instead of leaves. * * * * They say that the root of the golden tree extendeth to the center of tbe earth and there taketh nourishment of increase, for the deeper that they dig they find the trunks thereof to be so much the greater, as far as they may follow it, for abundance of water springing in the mountains. Of the branches of this tree they find some as small as a thred, and others as big as a man's finger, according to the largeness or straightness of the rifts and clifts. They have sometimss cbanced upon whole caves, sustained and horne up as it were with golden pillars, and this, in the way by which the branches ascend, the which being filled with the substance of the trunk creeping from beneath the branch, maketh itself way by which it may pass out. It is oftentimes divided by encountering with some kind of hard stone, yet it is in other clifts nourished by the exhalations and virtue of the root."

Basilius writes: "In Hungary there is had everywhere gold-silver—that is, in it there is gold—which, in its color and ponderosity, is pure, hath lost nothing, and is still in its working quality; and if it had not been interrupted and digged up unseasonably, then the silver would have been turned into pure gold."

Those old writers were ever ready to apologize when they were at fault. Our friend Webster, in enumerating the writers to whose ideas of mines and minerals he confesses himself indebted, accidentally omitted the name of one of them, in consequnence of which he says: "I should have inserted Gabriel Fallopius with those of the first rank, but had forgot him, yet must now commend him to the studious as one that hath toyled sore by arguments to promote mineral knowledge."

They bad a sly way of saying good things, those writers of eld—brief, graphic, and like their peculiar ideas or metals, mystical and half hidden. Webster, while mentioning the favorahle indications of desirable mining locations, tells us, among other points, that it is good to find "some small twigs of a vein of ore, for then they think that there cannot but be greater store if they can find the right way to it." It can he readily perceived that the impediments to successful mining which those workers encountered have not yet been overcome, for the great obstacle in the way of reaching large hodies of ore at the present time is that our miners can not *"find the right way to them."*

From their descriptions it will he seen that the features attendant upon gold veins were the same as now. They considered the pale blue slates approaching to hornstone, in general characteristics, as a favorahle class of rocks in which to find gold veins. The softer "granite" rocks—the decomposed granitic series of the present day—were then, as now, held "good." Also the "grey or blewish stones, flints or slates, red or yellow clay or earth, or that appears of many colors," a description which would apply to the appearance of a majority of the gold veins in the slate rocks.

"Rich" veins worked they in their day, those good fathers of mining, and, in sooth, similar veins would in our times be entitled to the same appellation. "Also every vein of gold whereof an 100 pound weight doth contain more than three ouncss of gold is rich. All the rest of the veins of gold are to be esteemed as poor ones." This last quotation is from Georgius Agricola, who, as one of his contemporaries asserteth, was "a person of great experience and laboriousness;" and who, finding that much that was then known of mines and metals was likely to he lost, "determined to write of subterransous things that which hs had read or learned of, such as were skillful in metallick knowledge, or which he had seen in the mines."

Although the "divining rod" had in those earlier times many staunch adherents, thsre were not wanting men of sound sense who gave evidence against it. Thus, Paracelsus: "Therefore care is seduously to bs taken, that ye snffer not yourselves to be seduced by the divinations of uncertain arts, for thsy ars vain and frivolous, especially the Divinatory rods, which have deceived many miners. For if they once show anything rightly, thsy on the contrary deceive ten times." Kircherus speaketh thiswise: "Certainly I very oft making an experiment of this thing upon the metallick bodies of gold and silver, was always frustrated of my hops." Those who have in our day depended upon it have, like Kircherus, besn "very oft frustrated of their hope." On ths other side a Mr. Gabriel Platte, asserts that he used a divining rod which: "I carried up and down the mountains where lead grew, and before noon it guided ms to tbs orifice of a lead mine." I quote from Webster again, who doubtingly says: "The like story to this I have seen in an unnamed author, but shall hers omit it, because I know not of what credit he was." He closss a chapter upon the rod with still mors doubt: "I shall say nothing, but refer all to experimsnt; for some have believed too much, and some too littls."

Their idea of the spirit or soul of metals, runs through all their writings. Paracelsus gives gold a threefold character: "Gold in essencs is threefold; 1. celestial and loosed; 2. fluid; 3. corporeal." Rhumelius gives it credit for four attributes: "There are four sorts of gold: 1. *Astralish*, while it is yet green, crude, immature and imperfect; because the stars as yet have their influsnce and first operations therein. 2. *Mineralish*, is that very thing, which as yet doth stick in earth-ore. 3. *Metalish*, is tbat which being freed from its schleck and raw mineralish ore-stuff, and with great force of fire is driven forth of it, and tben may be called a pure and clear metal. 4. *Elementalish*, is any earth, mineral or stone, or ths like, wherein the spirit of gold doth lie hid, and may be drawn forth by the Spagyrick art." Paracelsus, in his covert way, thus slyly says to thoss who would obtain this volatile spirit: "Wbosoever therefore goeth about to get and separats the *primum ens* of every such like body, doth stand in need of mucb experience and knowledge in the Spagyric science."

The placer mines were the most profitable ones in those olden times. Strabo writes: "That gold is not only digged forth of the pits or mines, but also the rivsrs and torrents do afford a golden sand; and that by digging of pits, divers other artifices, and wasbing the sand, they get much gold; and that more did get gold this way than hy mining. And that amongst the sparks or crumbs of gold, there are sometimes found clods or masses of gold of the weight of half a pound, that need but little purifying."

Massive nuggets were frequently found then, for Peter Martyr says: "Inasmuch that there hath heen found round pieces of three hundred pound weight, and one of tbree thousand three hundred and ten pound weight, which was sent whole to the king." Oviedus confirmeth the notation of this last-mentioned "round piece": "And the greatest of all that was found to this day, weighed three thousand two hundred castellanes of gold." Mr. Boyle tells of "a mineral that was there digged up, wherein pieces of gold of the length and also of the bigness of a human finger, grew in the ore, as if they had been parts and branches of trees."

Kircher tells of a "mine of antimony that held in it some gold." Wormius states: "In 1644, the noble John Sigfridus being General Overseer of Metallic Matters, found a mine of gold, the ore being black and like talk, shining with frequent grains, which when he had, tried, an hundred weight of the ore yielded 38 marks of pure gold. Another vein in 1646 did, being purified, yield six drachms of pure gold, contained in one pound." Lazerus Erken, Chief Mine Master to Maximilian, the Emperor, informs us that "gold is found in a white stone like marble (the Germans call it quartz); as also in a blue and yellow hornstone, likewise in a blue slate."

A question which has been revived in our day, and is still mooted without reaching a solution, was over two centuries ago definitely settled hy this old writer, Webster, whom we have quoted heretofore. Even in his time it was a matter of dehate as to the location of the Ophir from whence Solomon obtained so much gold. After devoting some pages to the subject, he says he will "lay down tbat proof that may demonstrate that the land of Ophir or Uphaz was the two Peru's now known to Europe. For that text is so plain, that no reasoning can be ahle to overthrow it. For it is said in the text: *'And the gold was the gold of Peruaim.'* And all men know that the Hebrews put *a-im* in the dual nnmber, as *Peru* heing the singular number, when *a-im* is added to it in the dual it makes *Peruaim.*" After this let this vexed question he at rest; for, has he not written that

"no reasoning can he able to overthrow it"!

A characteristic of gold mining existed in ancient times that is peculiar also to the present age. Diordorus Sicnlus is my authority for this assertion: "In the borders nf Egypt, that joyn to Ethiopia and Arabia, there are places very fertile of metals; forth of which, with *much labor and expense*, gold is drawn." The same author further describes the process of mining the ore from the veins of quartz, which was then termed "marble:" "That almost infinite thousands of men do dig forth, with iron instruments, the more soft rock, and which is broken with indifferent labor. He that discoverth the veius of gold, goeth before the workmen, showing what places they are to dig. They cleave the strong marble, being shewed, by the strength of strong bodies, not hy art, but by great force with iron wedges. But they drivo shafts or passages not straight, but that way which nature leadeth, hy the gold in the shiuing marble. But when hy reason of the divers hendings, and turnings, they are darkened in their passages, the workmen carrying lights before them, the rocks, hy great force heing cut in pieces, they carry up and cast upon the ground. Others cut them so casten into very small pieces, others carry them away. The pieces taken from these workmen, heing eut to a certain measure, they heat in stone vessels with a pestle, or hammer of iron, unto the smallness of millet seeds. They then heing cast into mills, are grinded unto the very fineness of meal. Then the workmen taking it ground, do put it upon broad tables, a little declining, and agaiu heat or rub the marhle, water being cast upon it. By that means, the earth heing washed away, the gold hy its gravity doth remain upon the tables. This they often iterating, they rub the gold with their hands. Then with thin and porous spongos, they press forth the soft earth, until it he made like nnto golden sand. Lastly, other workmen do put it hy weight and measure into eartheu pots; and do superadd in a certain measure lead, seaweed or tange, and bran of barley. These things compounded in a certain proportion, they diligently leme or dauh up the pots with clay, or lute. Furthermore, heing decocted five whole days and nights in a furnace, pure gold is only found in the vessel, the other things heing wasted, the former weight heing little diminished." Webster, from whose work is copied the above translation, continues: "I have the rather delivered this at large, because it is a very remarkable passage, and perhaps not taken notice of hy many readers, and may he of some considerable use to an ingenious mineralist." The buddle which is used in the Cornish mines had its counterpart in the workings hnndreds of years ago.

From the foregoing extracts an idea may he gained of the views held more than two centuries ago, in regard to the nature of metals. Many of the chemical properties of metallic salts were understood practically, hut theoretically they were not comprehended; wild and visionary views heing entertained concerning them. Their aim was to discover the essence or vital principle of each metal, which they helieved to exist, and hy the aid of which all metals of a lower grade could be raised or transmuted to the more valuable metals above them in the scale. But in the search for the unknown, in the vain desire to materialize the ideal, much valuable knowledge was obtained, sufficiently so to form that heautiful process of practical chemistry which now stands forth as one of the noblest evidences of the power and strength of the human intellect.

News in Brief.

The marriage of General Garibaldi has heen annulled.

Parnell spoke at a meeting in Philadelphia last Saturday.

A new opera house at Napa was dedicated January 9th.

Comanches from Texas are depredating in New Mexico.

The delegation of Ute Indians have arrived in Washington.

Dr. William Budd, the eminent London physician, is dead.

The St. Louis shoemakers demand an increase of 10% in their wages.

In county Galway, Ireland, process-serving is heing violently resisted.

The life insurance fund of the Pacific Stock Exchange has heen aholished.

Bogart, the defaulting treasurer of the New York Produce Exchange, is dead.

A serious strike is in progress among the miners in the Basin of the Loire, France.

In the Kanawha valley, W. V., the miners are in a state hordering upon insurrection.

Unemployed laborers at Cork, Ireland, plundered meat and bread shops Saturday last.

The death of Lieut. Gen. Skoheloff, Russian Inspector General of Cavalry, is announced.

The convention of the National Greenback Labor party will he held in Chicago June 9th.

Beecher addressed a meeting in New York recently in hehalf of the sufferers in Ireland.

Great excitement still exists in Maine, two State Governments now heing in existence.

Earthquakes occurred January 9th at several points in the southern part of the State.

Much sickness prevails among the British troops in Afghanistan, principally pneumonia.

At Manuwaki, Canada, a man named Brishes chopped his partner to pieces and escaped.

An unsuccessful attempt was made in New York recently to roh the grave of Count Joannes.

The True Healing Art.

We have received a copy of a lecture just published by Dr. DeWitt Clinton Moore on "The Science of Health Conservation and the True Healing Art, Hygeio-Therapy." The lecture is devoted to "explaining the first principles of Hygienic Medication, or a true Medical Science, and exposing the fundamental fallacies of all drug systems." The lecture fills a closely printed pamphlet of 12 pages, and is written in a very vigorous and straightforward style. It can hardly fail to hold the reader's attention to the close, although its unyielding rebuttal of most accepted ideas of medication will awaken opposition in many minds. The subject advanced and ably treated is one of the greatest importance, and certainly should be considered by all. We have not space to review the argument built up by the author. Indeed, this is not necessary, as the pamphlet is for free circulation, and all may obtain it by sending a three-cent stamp to the author at No. 8 Ellis street, San Francisco. It may be said, however, that the system advocated is one in which no drugs are used except to kill abnormal growths or remove offending material, and it is maintained that "as health results from a right use and relation of things and conditions (affecting life), disease must be caused by abuse or misrelation of them; hence, the true healing art consists in returning the patient to obedience to these laws—by placing him in true relation to his environment—in removing the causes of disease and supplying the best conditions of health."

OUR AGENTS.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. Tharp—San Francisco.
B. W. Crowell—California.
A. C. Knox—Pacific Coast.
S. V. Blakeslee.—California.
O. W. McGrew.—Santa Clara county.
J. B. Bachelder.—Shasta County, Cal.
James Rogers—Oregon and Washington Ter.
Thos. H. Manning—Nevada, Idaho and Montana Ter.
Capt. W. H. Seamens—Arizona.
M. P. Owen—Santa Cruz County.
H. E. Hallett—Los Angeles County.
Perley P. Kilbourne—Sacramento County.
M. B. Starr—Contra Costa county.
F. M. Varden—Alameda Co., Cal.
C. A. McMahon—Butte Co., Cal.
W. B. Turner—California.
J. W. A. Wright—Merced, Tulare, Kern and Fresno counties.

We are under obligations to Messrs. Dewey & Co., S. F., for a copy of the "Pacific Rural Handbook," by Charles H. Shinn. The book embraces 120 original pages, and contains a series of brief and practical essays and notes on the culture of trees and shrubs, adapted to the Pacific Coast; also hints on farm and household economy. It contains valuable suggestions on laying out grounds, improving soil, irrigation, wind-breaks and hedges, fruit trees and small fruits, shade trees, shrubs, the vegetable garden, flower garden and lawn, seeds and seed planting, cuttings, etc. The book is substantially bound in cloth, and sent postpaid for $1. Address Dewey & Co., No. 202 Sansome St., San Francisco.—*Kern County Gazette.*

Bound Volumes of the Press.—We have a few sets of the back files of the Mining and Scientific Press which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future refereuce and library use.

A Cylinder Pressman

Of good experience wants a situation in a S. F. or interior office. Understands running an engine. For a steady situation will accept moderate wages. Address "No. 2," this office.

An Engineer

Wants a situation to run a stationary engine in the city or country. Will accept a modorato salary. Address "No. 1," this office.

Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Sample Copies.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

Extra Copies can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew Jackson's Best Sweet Navy Tobacco

METALS.

[WHOLESALE.
WEDNESDAY M., January 14, 1880.

Iron.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
Copper.—	
Sheathing, lb	22 @— —
Sheathing, Yellow	18 @— —
Sheathing, Old Yellow	8 @— —
Nails	25 @— —
Bolts	24 @— —
Brazier's, in all sizes	24 @— 30
Old	16 @— —
Steel.—	
English Cast, lb	15 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
Tin Plates.—	
10x14 I O Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
Zinc.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
Nails.—	
Assorted sizes	3 50@4 50

LEATHER.

[WHOLESALE.
WEDNESDAY, M., January 14, 1880.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kll, doz	48 00 @50 34
11 to 13 Kll	46 00 @57 00
14 to 19 Kll	61 00 @73 00
Second Choice, 11 to 16 Kll	55 00 @70 00
Cornellian, 12 to 16 Kll	57 00 @67 00
Females, 12 to 13 Kll	63 00 @67 00
14 to 16 Kll	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kll	58 00 @62 50
14 to 15 Kll	66 00 @70 00
16 to 17 Kll	72 00 @74 00
Simon, 18 Kll	61 00 @63 00
20 Kll	65 00 @67 00
24 Kll	72 00 @74 00
Robert Calf, 7 and 9 Kll	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	35 @ 37½
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	15 @ 18
Wax Side	15 @ 18

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]
San Francisco, January 14, 3 P. M.

Silver, par.
Gold Bars, 890@910. Silver Bars, 10@18 ⅌ cent. discount.
Exchange on New York, 20, on London bankers, 494@49¾, Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 90@90½.
London Consols, 97 5-16; Bonds (4½), 106¼
Quicksilver in S. F., by the flask, ⅌ lb. 39c.

Signal Service Meteorological Report.

San Francisco.—Week ending January 13, 1880

Highest and lowest barometer.

Jan. 7	Jan. 8	Jan. 9	Jan 10	Jan. 11	Jan. 12	Jan. 13
29.038	30.196	30.057	30.327	30.449	30.415	30.287
29.765	30.028	29.830	29.991	30.374	30.300	30.111

Maximum and minimum thermometer.

59	50	57	52	54	48	54
46	46	48	44	40	41	43

Mean daily humidity.

75	71	84.3	56.3	70.3	68	66.7

Prevailing wind.

S	W	SW	NW	N	N	N

Wind—miles traveled.

164	279	281	362	228	77	158

State of weather.

Cloudy	Fair.	Cloudy	Clear.	Clear.	Clear.	Clear.

Rainfall in twenty-four hours.

.24	.12	1.03	.03			

Total rain during the season, from July 1, 1879, 10.84 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juan County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Fourth (24th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No 420 Montgomery street, San Francisco, California.

Butte Hydraulic Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Poirson	13	2½	$25 00
L Lapierre	22	2½	25 00
H Marceoux	24	2½	25 00
J B Lussier	25	2½	25 00
John Britt	26	2½	25 00
Geo W Deitzler	37	5	50 00
N Desautelle	41	2½	25 00
Jos Lucier	42	2½	25 00
N Goldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervais	45	10	100 00
Geo Moreau	46	5	50 00
Geo W Deitzler	47	15	150 00
A S Hawes	17	10	100 00
J Callaldream	4	10	100 00
A M Wilder, Trustee	1	10	100 00
A L Lengfeld	5	5	50 00
L L Dennery	6	5	50 00
W E Lutz	7	5	50 00
Geo. H. Powers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francisco California, on Monday, the 22nd day of December, 1879 at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 3, No. 220 Sansome St., San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock of the Butte Hydraulic Mining Company is postponed to the Fifth day of January, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock is postponed to the second day of February, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

San Francisco, Cal., January 3d, 1879.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the 24th day of December, 1879, an assessment (No. 40) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the First day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Mariposa Land and Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 10th day of December, 1879, an assessment (No. 17) of Fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. currency to the Secretary, at the office of the company, room 33, Nevada block, No 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of January, 1880, will be delinquent and advertised for sale at public auction; and unless payment is made before will be sold on the 2d day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

LEANDER LEAVITT, Secretary.

Office—Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, California.

Numa Mining Company.—Location of Prin-

cipal place of business, San Francisco, California. Location of works, Humboldt County, Nevada.

NOTICE.—There is delinquent upon the following described stock on account of assessment (No. 2) levied on the 23d day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Alexander, E W	43	2000	$40 00
Blasdel, E W	15	250	5 00
Blasdel, E W	16	250	5 00
Blasdel, E W, Trustee	27	500	10 00
Blasdel, E W, Trustee	28	500	10 00
Blasdel, E W, Trustee	30	500	10 00
Blasdel, E W, Trustee	31	500	10 00
Blasdel, E W, Trustee	45	250	5 00
Blasdel, E W, Trustee	46	250	5 00
Blasdel, E W, Trustee	47	500	10 00
Blasdel, E W, Trustee	49	500	10 00
Blasdel, E W, Trustee	50	2500	50 00
Blasdel, E W, Trustee	51	4000	80 00
Blasdel, E W, Trustee	64	250	5 00
Brown, George A	42	500	10 00
Burns, A M	23	7500	150 00
Burns, A M	55	500	10 00
Burns, A M, Trustee	56	2500	50 00
McKusick, H J	44	4000	80 00
Merry, D B	65	500	10 00

And in accordance with law and an order of the Board of Directors, made on the 10th day of November, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 328 Montgomery street, room 21, San Francisco, California, on Monday, the Twelfth day of January, 1880, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale

DAVID WILDER, Secretary.

Office—328 Montgomery St., room 21, San Francisco, California.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer County, California

Notice is hereby given that at a meeting of the Board of Directors, held on the Fourteenth day of January, 1880, an assessment (No. 2) of Ten Cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. Gold coin, to the Secretary, at the office of the Company, room 1, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 11th day of March, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

A. C. TAYLOR, Secretary pro tem.

Office, 314 Bush street, San Francisco, California

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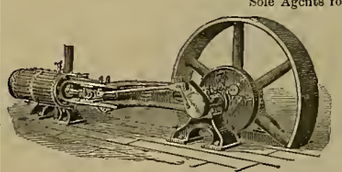

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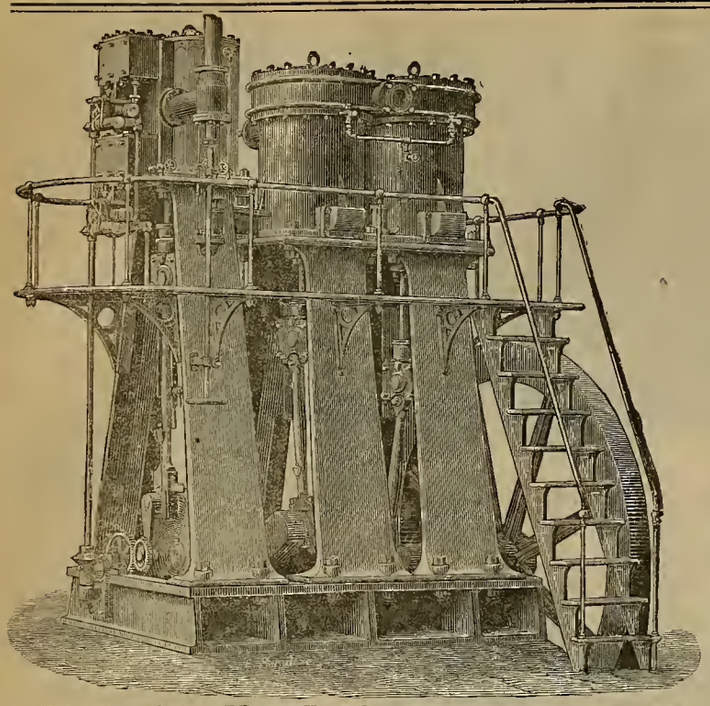

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DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half-year ending this date, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a Dividend on Term Deposits at the rate of Six and Nine-Tenths (6 9-10) per cent. per annum, and on Ordinary Deposits at the rate of Five and Three-fourths (5¾) per cent. per annum, free from Federal Taxes, and payable on and after the 15th day of January, 1880. By order. GEO. LEITE, Secretary.

San Francisco, December 31st, 1879.

DISSOLUTION OF COPARTNERSHIP.

The partnership heretofore existing between George Spaulding and Solon H. Williams, in the city and county of San Francisco, under the firm name of Spaulding & Williams, is this day dissolved by mutual consent.

George Spaulding alone is authorized to collect the outstandings and accounts, and will pay all claims against the late firm.

GEORGE SPAULDING,
SOLON H. WILLIAMS.

Dated at San Francisco this 1st day of November, 1879.

The business of job printing and publishing in all its branches will be continued as heretofore by George Spaulding, at 414 Clay St.

San Francisco Jewelry Manufactory.

D. W. LAIRD,

27 Post St., bet. Kearny and Montgomery,

(Opposite Masonic Temple.)

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Miners, write for your paper.

This paper is printed with Ink furnished by Chas. Eneu Johnson & Co., 509 South 10th St., Philadelphia & 59 Gold St., N. Y. Agent for Pacific Coast—Joseph H. Dorety, 120 Sutter St., S. F.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JANUARY 24, 1880.

VOLUME XL Number 4.

Lodes and Ore Deposits.

Mode of Origin of the Great Flat Lode.

In our issue of December 27, 1879, we gave some extracts from a paper by C. Le Neve Foster "On the Great Flat Lode south of Redruth and Camborne, and on some other tin deposits formed by the alteration of granite." In that part of the paper treated in that number of the PRESS, we gave some engravings showing sections of the lode in question, and we have now to consider the probable mode of origin of these deposits of tin. These distinctive features are:

1st. The invariable presence of a small leader, generally only a few inches wide, apparently occupying the space due to the shifting of the two sides of a comparatively flattish fissure, and filled partly mechanically, partly chemically.

2d. A lode or mass of stanniferous schorl rock, containing 1% to 3% of cassiterite, from 4 to 15 feet in width, either above, below, or on both sides of the leader. The tin is distributed in little grains in the rock, or in strings or minute veins. We believe that the fact of the lodes themselves consisting of *schorl rock* is a point which has never before been made known.

3d. Schorl rock poor in tin ore (locally called *capel*, *grayback*, *black granite*), separating the lode from the granite, and schorl rock, with its constituent minerals arranged in layers, also called *capel*, separating the lode from the killas.

4th. Gradual passage of the schorl rock (capel) into lode on one side and into granite or killas on the other; in other words, absence of any *wall* between the capel and the lode, or between the capel and the enclosing rocks.

All these facts point, in Mr. Foster's opinion, to the idea that the lode and capel are merely altered rocks, the fissure now occupied by the leader having served to bring up vapors or solutions capable of entirely changing the rock on both sides of it. The microscopical examination affords confirmatory evidence that the compact blue stanniferous schorl rock was once granite.

Alteration of Granite in other Districts.

That granite can be altered into schorl rock is a fact that can scarcely be questioned. Every china-clay pit affords evidence of the fact. You constantly find little veins of quartz, or quartz and tin ore, bounded on each side by granular schorl rock, which is followed by granite more or less decomposed. The sharp walls of the quartz veins on the sides of the original fissures, and the absence of such walls between the granite and the schorl rock, is what would be expected if the altering solutions gradually soaked in from the sides. Sometimes the schorl rock itself bears plain marks of its origin, as it contains numerous pseudomorphs of quartz after orthoclase.

It must not be supposed that schorl rock is the only form of altered granite. The conversion of granite into "Greisen" is not uncommon, and Prof. Von Cotta has given ample proof that the fine grained *Zwittergestein* has also been derived from the same rock.

In the parish of Wendron, Cornwall, are several remarkable tin deposits deserving special mention in this connection.

The Balmynheer mine is remarkable for presenting a large, irregular mass of stanniferous rock, the mode of occurrence of which will be seen from the accompanying section (Fig. 1.) In this, *G, G*, is ordinary granite, *B, B*, is the tin-bearing rock, in the form of a mass from 30 to 50 feet thick and following the *slide*, *A, A*, six inches thick is a vein of white clay with a little quartz and mica. Much of the tin rock is full of little cavities and where this honeycombed structure is apparent the stone is sure to be rich in tin. Between the tin-deposit and the underlying granite there is no regular plane of separation; on the contrary there is a gradual passage—the rock becomes less cellular, feldspar crystals appear spotted with chlorite and finally you come to clean granite. Occasionally there is a little tin rock above the slide or the granite may contain iron pyrites.

The Lovell mine is an example of a still more curious deposit, there being two so-called lodes or veins, the two lodes finally uniting. At the south lode I take a section as I saw it at 30 fathom level (Fig. 2).

In the engraving, *A A*, is ordinary granite, *B B*, is the so-called *cab*, composed of quartz, mica, gilbertits, chlorite, iron pyrites, copper pyrites, and a little schorl. It is usually from 6 to 12 inches thick, and is sometimes found on both sides of the lode. *C C*, is the lode itself, a compact, dark-colored mixture of quartz, gilbertite, mica, zincblende, chlorite, iron pyrites, and a little copper pyrites, fluor and tin stone; of the latter the rock carries two and a half per cent. The most remarkable point with regard to this lode is the occurrence of numerous pseudomorphs of quartz after orthoclase, many an inch long by one-quarter inch wide. And they show out very plainly in the dark ground formed by blende and chlorite. Some of the pseudomorphs contain small grains of cassiterite. The lode is traversed by numerous joints, which are mere planes of division in the rock; the principal ones dip and strike at the same angle as the lode itself. When, however, a joint diverges it carries "lody stuff" with it. Thus, if a joint, *E F*, goes off from the main joint, *C D* (as shown in plan, Fig. 3) a little tin stuff will be found following it for a short distance into the granite. These so-called lodes or masses of tin-bearing rock, do not run continuously from one end of the mine to the other, but only occur in bunches here and there; and when these gradually come to an end on all sides, the lode becomes a mere joint in the clean granite.

The South Wendron mine, adjoining the

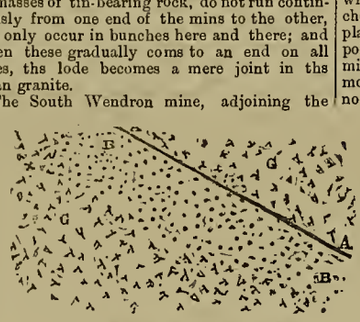

Fig. 1. Section at Balmynheer.

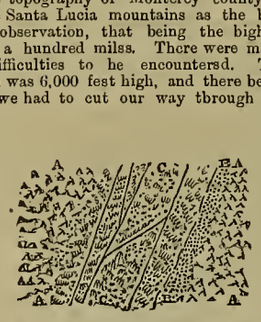

Fig. 2. Section at Lovell Mine.

Fig. 3. Plan of Lode at Lovell Mine.

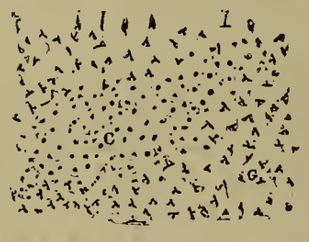

Fig. 4. Plan at South Wendron Mine.

Lovell on the southeast, is worked upon a *pipe* of tin-bearing rock of a somewhat remarkable character (Fig. 4.) It may be described as a very irregular cylindroid of stanniferous rock, merging gradually on all sides into granite, with its axis dipping at an angle of 49° in a direction N. 25° W. The longer axis of the oval section of the *pipe* is from 20 to 60 feet in length, whilst the shorter is about 10 feet. The mass consists of quartz, mica, gilbertite, a little iron pyrites and tin stone, and is traversed by a few irregular joints. The stuff is usually cavernous or honeycombed, and in the little cavities fine acicular crystals of tourmaline may often be detected. The southern part of the *pipe* is sometimes very granitic in appearance, and consists of pink orthoclase crystals imbedded in a mass of quartz, chlorite, mica, iron pyrites, copper pyrites, fluor and tin ore.

The characteristics of these three deposits may be summed up in a very few words: They are masses of stanniferous rock passing gradually into the surrounding granite. The fact of the passage and the presence of the pseudomorphs justify us in concluding that the so-called lode at the Lovell mine was once granite; and if this is admitted, we can have no hesitation in affirming that the Balmynheer and South Wendron deposits were formed by the alteration of the same rock.

The conclusions drawn from these facts as bearing on the question of the proper definition of the term lode or mineral vein, we shall give in our next number.

The Solar Eclipse.

Observations of the Coast Survey Party.

At the meeting of the California Academy of Sciences on Monday evening, Prof. Geo. Davidson, of the U. S. Coast Survey, said that, as Superintendent of the Coast and Geodetic Survey, had given him permission to communicate to the Academy the general facts observed during the late solar eclipse. Then, with the aid of the blackboard, he described the points of interest in a very lucid manner. He said:

In the late eclipse the cone of shadow was so small, from the apparent diameter of the sun and moon being so nearly the same—the latter exceeding the former by only the two-hundredth part, that it made it hardly worth the while of astronomers to come here from different places to view it, especially as it took place so late in the afternoon. Being well acquainted with the topography of Monterey county, I chose the Santa Lucia mountains as the best place of observation, that being the highest point for a hundred miles. There were many minor difficulties to be encountered. The mountain was 6,000 feet high, and there being no trail, we had to cut our way through the

exhibited themselves. On account of the slight apparent diameter of the moon, the crusts became remarkably sharp. As the moon advanced, upon its edge became visible the lunar mountains. The darkness above the disk of the moon was less than the darkness of the moon on the sun. Venus and Mercury have both been seen projected on the corona before their transits, and it has been supposed possible to see the dark body of the moon before it touches the sun. None of us saw it, however, and I doubt if any authority has.

My instrument was so arranged as to exclude all but one-tenth of the light and heat rays. The approach can be detected by spectroscopic methods before it quite touches, but not as a dark body. As the two disks became concentric, the crescent was moderately prolonged, because the diameter of the moon was apparently only 1-200th greater than that of the sun. At that time the sun was passing into some cirrus clouds. I was somewhat surprised at the prolongation of the segment. As it became narrow the phenomenon of Baily's Beads, a series of bright points of the sun hanging on the edge of the moon, caused by the irregularity of the waves of light from atmospheric vibration, was possible. This phenomenon was not visible owing to the clear atmosphere, but the line of light was broken into dots and dashes, like the Morse alphabet. And when one point of light disappeared it did not reappear, as in Baily's Beads, but was gone for good. Thirty seconds is a very short time, unless you are hanged by the neck. That was all the time we had, however. Each one of us attended to his assigned duty. I was seeking for an intra-Mercurial planet, and had one chance in a million. I had prepared a chart, with all the stars down to the seventh magnitude, and hoped to locate any unknown star by the configuration of those about it. I was satisfied beforehand, however, that the sky was too bright and that the cone of shade was too bright from a sort of re-illumination.

When the shadow came over the ocean we saw a shade of so light a brown that it was a disappointment to me, knowing that an intra-Mercurial planet would probably be invisible. There are four sketches of the corona made by our party, however, more consistent in their outlines than those by many more skilled observers with much more time. It is impossible to describe the magnificence of the sight that the eclipse presented. Huge masses of red flames burst out above the upper surface of the sun one-twelfth or one-fifteenth of its entire diameter in size, from 40,000 to 50,000 miles in height. The lower limb of the sun produced a broken, jagged line of rose-colored intense flame, extending around a third of the sun's circumference, above the apparent disc of the moon, and covering millions of miles in area. The flames were visible for one or two seconds after the disappearance of the sun, a rather unusual phenomenon. After the re-appearance of the sun a curious thing occurred showing the effect of atmospheric causes. The atmosphere became disturbed and in watching the end of the eclipse the limbs of the sun and moon were remarkably disturbed. The smaller telescopes lost the point of contact. As the moon went out of the sun's disc, two curved, wavy lines appeared in black and red. Had the atmospheric vibration occurred at totality we should have had an exhibition from this cause of Baily's Beads. The photosphere or disc of the sun during totality was covered with the phenomena known as "rice grains." The mottlings were remarkably well portrayed. Among these were larger and more crooked lines of bright light of irregular shades and forms. These were the aspect of the masses of flame. The theories of various astronomers and physicists were referred to, and the speaker seemed to favor that in which the greater part of the solar volume was gaseous, highly condensed, because it would best account for the supply of heat which the sun was constantly radiating into space. In the corona as seen by the spectroscope, the green line called "1474," for which we have no element on earth, and the helium line preliminarily so called, were exhibited.

chemical. In the instructions for astronomers issued in 1878 for the eclipse of 1879, it was especially mentioned that the English and American almanacs differed so that the estimated paths of totality differed three miles in location. I was desirous, though the arrangements could not be made, of having the north, south and central points determined by different observers at different points, and thereby rectify minute errors that might exist in the nautical almanac. To meet the requirements as well as possible our party was equipped with a large equatorial of 6½ inch objective, one of 3 inches, two of 2⅞, and one of 2¼, all good glasses of high power and definition. These last qualities, as well as the quiet atmosphere and the high elevation which we sought to obtain, are necessary in order that the first and last points of contact may be accurately observed. The beginning all along the coast was similar to what you saw here.

The moon left the sun at a point about 16 degrees from the vertical on the left. By the high power and large aperture of my glass I was enabled to see the first movement on the limbs several seconds ahead of the others.

Both disks were real and not spurious. Spurious disks arise from the undulations of the atmosphere, occasioned by unequal refraction, and in that case the body of the sun or moon will not only appear too large, but there will be no well-defined point of contact at any phase. As the moon advanced we saw its contact with the sun's spots in three different groups. As totality advanced, several peculiar phenomena

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SPURGEON is still at Mentone in Southern France, and so sick as to be frequently troubled with attacks of mental despondency. He writes occasional letters to his congregation in London.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Spruce Mountain Mines.

Answers to Important Inquiries.

EDITORS PRESS:—I would like, through the medium of your valuable and highly appreciated columns, permission and space to answer the several questions recently received from different parties by letters of inquiry regarding the principal mines in this district; its location and facilities for working the ore. Knowing your ability and willingness to aid and assist in the development of any legitimate mining enterprise, I believe that such permission will be granted; and I will consequently proceed:

1. This mountain is 35 miles southerly from Wells, a town 215 miles west of Ogden, on the Central Pacific railroad. The wagon road from Wells to Spruce mountain is of good and easy grade, over which heavy freight teams are frequently passing on their way to Cherry Creek, Shelhorn, Ward and other points south of Sprucemont. The mountain is surrounded by fertile valleys, in which stock raising and farming are successfully conducted. This mountain is sufficiently heavily timbered to last, for mining and building purposes, for many years. The adjacent foothills are heavily timbered with nut-pine, the best wood for making coal. There is plenty of water for all practical purposes, and nothing lacking that nature can provide to make it the equal of Eureka or the best camp in the west.

I will only give descriptions of a few of the principal mines, which I think will be sufficient to satisfy those anxious inquirers for mining property, in which they can be sure of making a safe, legitimate and remunerative investment.

The Mines.

I will first describe the Juniper. It is situated on a spur of the mountain running from the summit to the northeast, and is developed by cut, tunnel, incline and shaft to a depth of 150 feet. For the last 50 feet, it shows a very large body of good ore. The size of the ledge is not known, but it is evidently a "mammoth" mine. The ground is patented. A tunnel has been started to cut the ledge, and is in 300 feet, but has not reached the point where it should strike it, at a depth of 250 feet; but it will probably be driven ahead ere long to that point, where the owners expect to open a bonanza.

The Black Forest group of mines are situated a quarter of a mile northeast from the Juniper. There are four locations adjoining, of which the Black Forest is the principal. It is developed by three tunnels run into the mountain at different levels, each tunnel cutting the ledge and showing large bodies of high grade, free smelting ore. The upper tunnel is in about 80 feet, and has cut two large chimneys of ore. The upper and middle tunnels are connected by an incline run down on the first chimney. The middle tunnel is in about 225 feet, and has cut three large chimneys of ore. It is connected with the lower tunnel by an incline run down by the side of the third chimney. The lower tunnel is in about 275 feet, and cuts the vein at a depth of about 300 feet on the dip from the top of the ledge. From the level of the lower tunnel there have been two inclines sunk on the vein—one 30 and the other about 50 feet—both of which show the largest and cleanest body of ore in the mine. The prospects for further developments are exceedingly flattering. There has been no stoping nor drifting done in the mine for the purpose of extracting ore, only such as lies in the regular course of the tunnels and inclines having been taken out. It is estimated by good judges that there are from 600 to 700 tons of splendid ore on the dump, and from 8,000 to 10,000 tons in sight, which can be placed on the dump at a very small expense. The ore is calculated to average 40% lead and from 40 to 50 ounces in silver per ton. I can here give you a better idea of the facilities for and the expense of working the ore in this mine by figures obtained from reliable men who have had many years of experience in the business elsewhere:

1. A 30-ton furnace can be built and arranged ready to run for about $10,000.

2. Six coal kilns, 17 feet in diameter by 18 feet high, will furnish sufficient coal for the furnace. Two men are all that are required to attend to them; said kilns can be built for $5,000.

3. Wood can be contracted for at from $4 to $5 per cord, and one cord will yield from 45 to 50 bushels of coal—the cost of which will not exceed 12½ cents per bushel. Seven hundred and fifty bushels of coal are sufficient to smelt 30 tons of ore.

4. The ore in the Black Forest mine can be extracted and placed on the dump for $1.50 per ton, and hauled from dump to furnace for 50 cents per ton.

5. The cost of smelting will not exceed $7 per ton.

6. Three tons of this ore will yield one ton of bullion. The freight on bullion from furnace to railroad (Wells) will cost $8 per ton, and from Wells to New York market $40.50 per ton—making freight $48.50.

7. For the convenience of inquirers and readers of this article, I will arrange in condensed form (hereafter) the figures showing the expense of converting 10,000 tons of this ore into cash; also the net profit resulting therefrom.

Great care has been taken to obtain the above figures from practical and reliable men, such as John McVicker, of Salt Lake City, and many other reliable assayers; also Mr. Frantz Jung, of the Germania Smelting Company, Utah, Mr. Remley, of Utah, a practical coal-kiln builder and burner, and from the different general freight agents of the railroad companies from the Central Pacific railroad to New York city.

I believe that the calculations and figures given below can be worked up to and the result, as shown by the figures, fully demonstrated:

Value of lead in 3,333⅓ tons of bullion at 5½ cents per lb., in New York market	$366,666.66
Value of silver in bullion, reckoning 40 ozs. per ton of ore, or 120 ozs. per ton of bullion, at $1.12 per oz.	448,000.00
Total	$814,666.66
Cost of furnace, machinery, etc.	$10,000.00
Cost of 6 coal kilns	5,000.00
Cost of ore house, track, cars, etc.	3,000.00
Cost of mining, hauling and smelting 10,000 tons	90,000.00
Freight on 3,333⅓ tons of bullion from furnace to New York market	161,666.66
Total	$269,666.66
By net profit in the business	545,000.00
	$814,666.66

I will here add that, in addition to the above-described mines, there are numerous prospects that show exceedingly well for the amount of work done on them. I am confident that if a good company, using sound judgment, with the necessary qualifications, such as capital, energy and honor (a part of which, however, may be a novel element to some who have been in this camp), would buy the property, they can, within 60 days from date of beginning, declare a dividend of over $30,000 from the net profits, and continue so doing regularly every 30 days thereafter. I hope that the inquirere will find in the above the information desired.

OLD FORTY-NINER.

Wells, Elko Co., Nev., Jan. 14, 1880.

Northeastern Arizona.

EDITORS PRESS:—While general attention is being directed to the central and southern portions of the Territory of Arizona, little or nothing is said about Mohave county, comprising the northeastern portion of the Territory. This immense county is about 250 miles long, with an average width of 100 miles. Its resources are limited almost entirely to mineral products, gold, silver, lead, antimony, copper and iron ore being found in great abundance in all parts of the county. Its agricultural products are decidedly limited, only two small portions of the county being in any way suitable for farming, viz.: Along the Sandy creek, at the southern end of the county, and along the river bottoms of the Colorado, which bounds the county on the north.

The land along the Sandy suitable for farming consists of a strip about nine miles long, varying in width from one-half to three miles; this produces every year large crops of barley, barley hay and alfalfa, which finds a ready market at Mineral Park, Signal, Cedar and McCracken and other mining camps in the county. Considerable flour and barley for Mineral Park, comes by Colorado river steamers from California. The agricultural lands on the Colorado consist of a few scattered ranches, devoted principally to stock raising, though some barley and hay is raised, most of which is consumed at Fort Mohave, on the river. Large quantities of watermelons are raised every summer on the rich river bottoms—melons that cannot be excelled anywhere for size and flavor. There are also a few scattered ranches, consisting of a few acres each at the springs and stage stations, devoted principally to vegetable raising, but these like the springs and stations are very few and far between.

It is to the

Great Mineral Resources of Mohave County

That I desire principally to call attention. There is a wealth of mineral here in this almost unknown part of the world that is destined ere long to throw into the shade all past discoveries in the Territory, not excepting even the great Tombstone district. The principal mining district of the county is situated in and around Mineral Park. Within a radius of 20 miles are the mining districts of Cerbat, the former county seat, Stockton, Hualpai Mountain and Chloride. Mineral Park, the present county seat, has a comfortable court-house, recently erected at a cost of $6,000, two large stores, post-office, livery stable, drug store, three saloons, two butcher shops, one shoemaker, two restaurants, an assay office, wagon and blacksmith shop, one doctor and three lawyers. Also one first-class five-stamp quartz mill, owned by Messrs. Breon & Spear, which has the reputation of being the best mill in the Territory of its size, and also of working ores to a higher percentage. Messrs. Breon & Spear are the wealthiest firm in the county, owning the mill, principal store, Keystone and Ithaca mines at Mineral Park, besides various other mines in other parts of the county, as well as a store at Fort Mohave.

The Keystone mine is down 260 feet, has steam hoisting works, and employs from 5 to 30 men. The ore is rich in antimonial silver, assaying from $100 to $1,500 per ton, averaging probably $300. This is generally considered the leading mine in the camp, but its title is disputed by the Lone Star, owned by W. F. Grounds. This mine is down 200 feet, and differs from most of the mines about here in that its ore carries a very large percentage of gold. This may be called the "specimen" mine of the county, furnishing any quantity of specimens rich in wire, horn, native and ruby silver; average ore from the 200 level of this mine will assay from $200 to $1,000 in silver and $100 in gold. This valuable mine, together with the "Setting Sun," a mine with an eight-foot ledge averaging $100 to the ton, has lately been sold to Messrs. Pinkham, of San Francisco, and Carroll, of Sacramento, who propose to erect immediately a ten-stamp mill, steam hoisting works, and to thoroughly prospect the two mines.

Another good mine is the Fairfield, formerly owned by Hon. W. H. Hardy, who is the present Superintendent, and sold by him last fall to a wealthy New York company. The company are running a tunnel 900 feet into the mountain to tap the main shaft of the mine at a depth of 250 feet. Pending the completion of the tunnel, about 250 feet of which remains to be finished, work on the mine is suspended. When the tunnel is finished the company propose to put a large force of men on the mine, and also to erect a ten-stamp mill and steam hoisting works. Great results may be expected from this mine, which has a brilliant future before it.

The Other Principal Mines

Around Mineral Park are the Ithaca, Setting Sun, Blue Boy, Starke and Ewing, Old Mohave, Cincinnati, and a thousand others on which more or less work has been done, according to the means of the locators. Suffice it to say that the whole mountain range is honey-combed with tunnels and shafts, and ore that will not assay $150 to the ton is not considered worth working. All that is wanted to make Mineral Park a second Leadville or Bodie, is a few live capitalists to develop our mines, the present owners not having the means to do so. Among other companies about to operate here is the Cerbat mill and mining company, owning about 15 mines in and around Cerbat; they also have a five-stamp mill in course of erection at the Gold Bar mine, which, as its name implies, is a gold mine. Specimens from this mine show free gold in large quantities. At Cerbat is the Connor mine and mill, owned by John Barry. This mill is doing good work on ore from the mine, which is one of the best in the county. At Chloride is a smelting furnace, formerly owned by Temple & Workman, of Los Angeles. This property has recently changed hands, and the new owners are now engaged in putting it in running order. At Stockton are several rich mines, notably, the I. X. L. and Infallible, at present houded to a company of Oakland capitalists who propose to erect a mill, etc.

All of These Outside Camps

Are dependent on Mineral Park for supplies, being supplied by pack-trains, etc. At Hackberry, 35 miles south of Mineral Park, is the property of the Hackberry mill and mining company, consisting of the Hackberry mine and a ten-stamp mill. This mine is down 450 feet, furnishing $400 ore enough to keep the mill running. This splendid property is now lying idle, owing to the company having become involved in litigation, caused by extravagant salaries to useless officials, offices in San Francisco, etc., together with general reckless management. At Hualpai Mountain, 25 miles from Mineral Park, is the celebrated American Flag mine. This mine was bought 12 months ago by six Cornishmen, for $25,000. Since then they have extracted ore enough to pay for the mine, besides doing over 700 feet of tunneling. Third-class ore from this mine assays $150 silver. Second and third-class ore is milled at Breon & Spear's mill, and first-class ore shipped to San Francisco. Here also is the celebrated Bill Deen mine, also involved in litigation. In the southern part of the county is the great McCracken mine, furnishing any amount of low-grade ore, keeping a 20-stamp mill constantly running. At Signal there is a 10-stamp mill; also one at Cedar, recently built by a New York company.

The assessment roll of this large county foots up over $840,000, and the great register shows a list of 345 voters, thus making this county, in proportion to its population, one of, if not the richest counties on the Pacific coast. Miners' wages are $4 a day; mill men, $5 and $6; engineers, $5; carpenters, $7; board, $10 and $11 per week. Provisions and clothing are very high; barley, from 4 to 12 cents per pound, according to season; flour, from $10 to $12 per 100 pounds; bacon, 30 cents a pound; eggs, 75 cents a dozen, canned fruit and meats, 75 cents per can; lumber, $140 per 1,000, and everything else in proportion. Meat is high, being 15 to 20 cents per pound; no mutton in the county. Any further information in regard to this part of the territory will be cheerfully furnished by the writer, whose name will be furnished by the Editor. * * *

Mineral Park, Mohave County, A. T.

Tem Pahute District.

EDITORS PRESS:—The district of Tem Pahute is situated in the western portion of Lincoln county, 200 miles east of south from Eureka, and about 100 miles almost due east from Tyho, in an isolated mountain, a broken continuation of the White Pine range, and evidently a segregation from that portion of the range known as the Pahranagat mountain, that rises skyward a few miles to the east. The Tem Pahute mountain is some ten miles in length by four in width, of an average altitude of from 6,000 to 7,000 feet. The ore-bearing belt is of immense width, measuring 1,000 feet at the southern, and widening to one-half mile at the northern end, with a general trend of north and south, and an easterly dip of from 30 to 70 degrees. The formation is, on the eastern or banging wall of the belt, a lime shale, like that at the Eureka Consolidated, and also at the Raymond & Ely at Pioche.

The western or foot wall of the belt consists of an immense reef of quartzite. Below this again, and appearing at intervals across the valley, is a white and red sandstone, where the geologist would find some very interesting erosions. The mountain is covered with the scrub pine and cedar peculiar to the country, useful for firewood and mining timbers, but for no other purpose. There is an abundance of feed in the foothills and valleys, of the nutritious grasses of the country—bunch-grass, sand-grass, etc. Water has heretofore been considered the grand desideratum, and the lack of it the great drawback; but of late, developments have demonstrated that an abundance of the aqueous fluid exists in the mountain eight miles west, several miner's inches having already been developed with a very small amount of labor.

The mines were discovered in '69, by a party of adventurous prospectors from Pahranagat, who, with such changes in their ranks as are incidental to and inseparable from a ten years' residence in a new mining camp have, with an abiding faith in the richness and permanency of their mines, remained in the district, sheltered in their rude cabins beneath the frowning bluffs, developing their property to the extent of their limited means, and manfully battling every adverse fortune.

The district has had its little tragedies, as what rich mining camp in this turbulent argentiferous region has not? Away up, near one of the highest peaks, a cedar whispers above the lonely grave of old man McMurry, a talented, kindly gentleman, well known to the pioneers of the State, who was shot down while defending his property from interlopers.

> He said no more, and never will.
> We buried him up in the brush,
> Where the shadows fall from the giant hill
> On his grave with a kindly hush.

And the fate of John Russell, the owner of the celebrated "Inca," while returning from Eureka, after having disposed of a quantity of first-class ore, his fearful death and the mysterious and very suspicious circumstances in connection with it, are still fresh in the minds of the people of this section.

Throughout the length and breadth of our immense mineral area, veins of the richest and freest chlorides known to mining men have been forced to the surface from nature's treasure-house in the bowels of the mountain, as if inviting capital and enterprise and labor to trail them to their fountain-head. At the southern end of the mountain, Messrs. McBurney & Lamb (the former a merchant of this place, and the latter an ex-foreman of the Eureka Consolidated) have a series of mines, and are at present engaged in pushing a tunnel, called the "Great Western," into the mountain, with the most flattering prospects. Immediately north are the Savage, Balbec, Blue Bell and others, the property of Messrs. Service, Putcher, Smith & Co. These gentlemen are pioneers of the district, have remained in it through evil and good report, and have a magnificent property for capital *intelligently handled*. Still further north is the Inca and Auxiliary mines, the property of Mr. George Russell. The Inca is too well and widely known to need but a passing glance. It has been developed to a depth of 300 feet. The ore body in sight varies in width from 5 to 15 feet, and the entire mass will mill from $150 to $200 per ton. Portions of this will go high into the thousands, and it is a fact well known, not only to us, but to the mill men of Kiko, Tyho, Reveille and Hamilton, that the ores of the Inca are so densely impregnated with silver that non-mineral-producing rock, lime, shale and spar, which mingles with it, will yield remunerative returns.

Negotiations are now pending at the East for the sale of this property, and it is to be devoutly hoped, for the reputation of our mines abroad, that they may be successful, and if so, it is again to be devoutly hoped that in order to make the enterprise ultimately successful, the company may place the management in *competent hands*.

Still north of the Inca is the property of the Chicago Company, who performed a small amount of work during '78, and I believe anticipate resuming operations at an early date, and of the Wyandotte Company, an association of Boston, New York and Philadelphia gentlemen. The mines of this company are the Wyandotte, Thompson, Rattler, and others, the Wyandotte being the only one developed to any

CONTINUED ON PAGE 58.

Mechanical Progress.

Important California Inventions.

Several valuable inventions have recently been produced by the mechanical ingenuity connected with the Central Pacific Railroad shops, at Sacramento, and which are briefly described in the *Record-Union*. The first which we notice, and which is now in successful operation at the shop, is

A Car-link Machine.

Invented by foreman Stephen Uren, of the blacksmith department, and by the use of which refuse scrap iron is in the brief space of a few moments converted into coupling-links and ready for use. The machine is made by the introduction of an attachment to the ordinary steam hammer, consisting of dies placed in the hammer and bed, to cut the iron to its proper length, curve, bend, lap and weld the links. This is all done with such rapidity that the iron does not lose its heat from the time it is first taken from the furnace until it is complete in links. The process by which this is accomplished may be briefly stated as follows: The refuse pieces of wrought-iron are weighed out and put up in the usual way for blooms, placed in the furnace, and when brought to the proper heat, they are then taken, one at a time, and placed under a 5,000-pound steam hammer, and by a few strokes are formed into billets of four inches square. They are then passed immediately into another furnace, and from thence through the rolling mill, which forms it into bars of the size desired for links. These bars, which are left by the rolling mill at red heat, are at once placed in the link machine, when by a single stroke a piece is cut off of proper length for a link, and the ends scarfed. The piece is then placed under another die of the machine, and a stroke upon each end curves them in shape to properly form, when brought together, one end of the link, while a third stroke with an oval die upon the center of the piece forms it into perfect link-shape, with the scarfed ends neatly lapped together ready for welding. It is then brought to welding heat, when it is again put into the machine, and with a single stroke the link is perfected and ready for use. The capacity of the machine, is 1,000 links per day, requiring 66,000 pounds of iron. The work done by the use of this machine is accomplished in about one-fifth the time required for the same number of men by the old process, and with corresponding economy in fuel. These advantages, together with its simplicity of construction, and the facility with which it can be introduced and attached to steam hammer machinery generally in use, will no doubt secure for it ready and general adoption. Mr. Uren has also recently introduced a process for making

The Best Cast-Steel

From the refuse steel scraps which have accumulated to the extent of hundreds of tons at the railroads shops, and which has heretofore been considered as entirely worthless. Under the process brought forward by Mr. Uren this waste material is readily converted into merchantable bars of the finest quality of cast-steel, and at the reasonably low cost of only about five cents per pound, as against the general market price of 18 cents. The practical working of this method has already been thoroughly tested by the manufacture of considerable stock, and is found in every way to be successful.

Still another improvement, which promises to be of great value to railroad interest, is

A New Wrought-Iron Car-Wheel,

Invented by General Master Mechanic, A. J. Stevens, of the Central Pacific road. The cost of this wheel will not exceed that of the ordinary cast-iron make, while it will be more durable, less liable to accident, and far less in weight. In making the wheel, the rim and hub are forged by machinery into two circular sections, with recesses in the sections of both rim and hub to receive the spokes. The spokes, which are made in the form of an ellipse, with rib in center of each side for increase of strength, are placed in position in these recesses, and the two parts of both rim and hub brought together, thus forming the wheel, but consisting of eighteen pieces, there being fourteen spokes in a wheel. The whole is then taken in that position and placed to a furnace, by the use of a large pair of tongs made for the purpose and operated with the furnace-crane, and when brought to the required heat for welding is placed under a five thousand pound steam hammer, in which are dies of the desired form, and with three strokes it becomes a perfect wheel and ready to receive the steel tire, which is fitted and shrunk on in the same method that the tires of locomotive wheels have been heretofore. One set of furnace men will manufacture from eight to ten of these wheels in a day. The difference in weight between cast-iron and this new wheel is two hundred and fifty pounds each in favor of the latter, which difference in an ordinary train of forty cars will amount to forty tons, or four full car loads of shipping weight. This indicates the importance of the improvement, and if it proves as successful as it now promises, will effect a general change in the rolling stock now in use.

Steels for Hardening and Tempering Purposes.

Hardening and tempering processes are performed upon steel for three purposes:

1. To enable it to resist abrasion and wear.
2. To increase its elasticity.
3. To enable it to cut hard substances and increase the durability of the cutting edge.

Of these, the first is the simplest, because the precise degree of hardness imparted is not of vital importance.

The second is more difficult, because the quality of the steel employed for such purposes is variable, and hence the tempering process must be varied to suit the steel. The third is of the greatest importance, because the articles to be tempered are the most expensive to make, the duty obtained is of the greatest consequence to manufacturing pursuits, and the fine grade of steel employed renders it more liable to crack in the hardening process.

In those mechanical parts of machinery which are hardened to resist abrasion and wear, the quality or grade of the steel is very often selected with a view to obtain strength in the parts and ease of mechanical manipulation in cutting them to the required shape, rather than to the capacity of the steel to harden. Hence, tougher and more fibrous grades of soft steel termed "machine" steel, are employed, meaning that the steel is especially suitable for the working parts of machines. This class of steel is of a lower grade than that known as "tool" steel. It is softer, works, both on the anvil and in the lathe, more easily, and will bear heating to a higher temperature without deteriorating. It approaches more nearly to wrought-iron, and is sometimes made of so low a grade as to be scarcely distinguishable therefrom.

The kinds of steel used where elasticity is desired, are known as spring steel, blister steel, and shear or double-shear steel, although, for small springs, steel of the tool-steel class is often employed.

The steel employed to make cutting tools is known as tool steel, being a fine, close-grained cast steel, harder but less fibrous and tougher than other steels. Treating these steels in the order of their importance, the last named takes precedence. The English brands of tool steel known as Jessops', Hohson's, Sanderson's, Groaves', Stubbs', Firth's, and some others, were for many years held in the most esteem; but of late several American brands are considered equal, and, indeed, by many, preferable, especially the Crescent Steel company's brand of tool steel. The secrets of successful tempering, however, are applicable to all brands of steel, since they consist in the method of manipulation. Whatever brand of steel the toolmaker may use, it is essential that it be as uniform as possible in its grade, so that the tempering process for one batch may be suitable for the next. If this is the case, the temperer is enabled to obtain reliable and uniform results by a constant process, instead of being obliged to alter the process to suit variations in the quality of the steel. Under these circumstances, the experience gained by constant practice is made available in securing the most desirable tempering process for that steel. If the steel varies much (all steels vary to some slight degree), the tempering may, of course, be varied to suit it; but, in this case, the practical man has no means of knowing what variation to make in the process until he has, by a trial, discovered wherein the degree of temper requires alteration or modification.

The preference of an expert temperer for a particular brand of steel is, by no means, to be taken as a proof of the superiority of that steel for the specific purpose. It may be that, under his conditions of manipulation, it is the best, but it may also be that, under a slight variation of treatment, other brands would be equal or even superior. It may be accepted as a rule that the reputation of a steel for a particular purpose is a sufficient guarantee of its adaptability to that purpose, and all that is necessary to a practical man is to be guided by the reputation of the brand of steel, and only change when he finds defects in the results, or ascertains that others are using a different steel with superior results.

Where large quantities of steel are used, the manufacturers in many cases request customers to state for what particular purposes the steel is required, their experience teaching them what special grade of their make of steel is most suitable.—*The Blacksmith and Wheelright.*

Straightening Castings.—Sometimes a casting is warped in cooling and requires straightening before being used. If the piece is to be planed or otherwise finished it should be straightened by heating and placing weights upon it. If it yields to this treatment, it will retain its corrected form after the scale is removed, and through all the after processes. But, if the piece is to be used without finishing, it may be straightened by "pening" with the hammer—striking with the "peno" or wedge-shaped end of the machinist's hammer. This process makes a series of indentations on the convex side of the iron, stretching the "skin" of the casting; but when these indentations are removed by after working, the casting is liable to return to its curved form. In "pening," that portion of the casting that receives the blow should be immediately over the face of the anvil or bench block; in other words, each blow should find a solid resistance, and the casting should be moved along the face of the anvil as the work progresses.

Scientific Progress.

Recent Researches in the Polarization of Light.

Faraday, in 1845, made the important discovery that bodies which (like glass or water) have ordinarily no particular action on polarized light, rotate the plane of polarization when influenced by strong electric or magnetic forces. Many experimenters have since worked in this field, and it has been proved that not only in solids and liquids, but in gases also, an electromagnetic rotation of the plane of polarization may be effected. MM. Kundt and Rontgen have recently described to the Munich Academy experiments by which they prove such rotation, even in the less easily condensed gases, hydrogen, oxygen, atmospheric air, carbonic acid, and marsh gas, and measure its amount. Their method consisted essentially in compressing the gas strongly in a copper tube with glass ends, through which a beam of polarized lime light was passed, the tube being surrounded by a coil of wire for passage of the current. For certain reasons the polarizer and analyzer were placed within or between the glass ends of the tube, and consisted of tourmaline plates. The polarizer end of the tube was fixed, while the rest of the tube, with the analyzer, could be rotated about its axis. The amount of rotation of the plane of polarization was found to differ considerably in the different gases, and to be greater the greater the index of refraction. In one and the same gas with varied density the amount of the rotation is proportional to the density.

An interesting question connected with such researches is that as to the possible influence of the earth's magnetism on polarization of light of the atmosphere. Some time ago M. Henri Becquerel made a striking experiment, in which, a beam of light having been polarized by successive reflections through a tube containing sulphide of carbon, it was found that if the tube was in the plane of the magnetic meridian, the plane of polarization had not the same position when one looked northwards as when one looked southwards. But if the tube was at right angles to the magnetic meridian, the plane had the same position whether one looked east or west, and its position was midway between those in the two other cases. This seemed to indicate a magnetic rotation of the plane under the earth's influence. Recently M. Becquerel has made numerous observations on atmospheric polarization in regard to the earth's magnetism. The plane of this polarization should coincide with the plane of the sun (a plane, *i. e.*, passing through the sun, the point looked at, and the observer's eye), when the sun's plane is vertical, if there were no disturbing influence. Now, looking at a point near the horizon, north or south, or better, near the magnetic meridian, when the sun's plane is vertical, the plane of polarization is found by M. Becquerel to be deflected by a small angle, and the coincidence of the two planes never occurs till after the passage of the sun. It is exactly as if the plane of polarization underwent a rotation, always in the same direction (which with reference to the axis of rotation of the earth is direct), and this rotation M. Becquerel attributes to the earth's magnetism. In the region at right angles to the magnetic needle, the rotation was found to be *nil.*

Noxious Vapors and Smoke.

Some highly successful experiments have been made for depriving smoke of its deleterious compounds. Sulphurous acid and carbon or soot, it is proved, can be completely scrubbed out by a mechanical process. The smoke, in its way to the chimney, is intercepted by two or more wooden racks; between these are dash wheels, which, as they revolve rapidly, throw water from a tank beneath in a fine spray over the racks; the smoke from the furnace is drawn through the chamber by the action of a fan driven at high speed. In the model showing the experiment, the liquid consisted of a solution of soda, which so completely absorbed the sulphurous fumes from burning brimstone that it was possible to inhale the air from the exit flue. Equally effective was the apparatus when turpentine, about the most fuliginous of combustibles, was burned. After its smoke had been washed in the model apparatus, a sheet of white paper was not soiled by exposure to the vapor—no longer smoke—of the flue corresponding to the chimney.

At this stage of the inquiry one cannot say if the experiment shows that erection on large premises will pay, or will altogether act in certain cases, but the experiment with the model, and the subsequent demonstrations of practical use in the chimney of a furnace consuming 50 tons of coal per week, proved the test a complete success. In the latter case a striking proof that the apparatus clears the products of combustion from soot consisted in first placing a piece of wetted linen in the ordinary furnace chimney, when it presented an inky aspect in about half a minute; a similar piece held in the flue from the washing apparatus was scarcely soiled.

Microscopic Discovery of Malarial Poison.

For some years, physicians and scientists have been much occupied in efforts to ascertain the nature of the poison which produces malarial fever, and success has finally crowned these labors, as will be seen by the following, which we copy from a contemporary:

The poison is not cognizable by the senses, nor can it be detected by chemical tests. The air of malarial districts has been analyzed, the soil has been submitted to microscopical examination, but no light was thrown on the subject. But not finding a thing looked for is only negative proof, and by no means decisive in any investigation. One thing was certain, namely, that the poison was generated in salt and freshwater marshes, in wet meadows, from vegetation decaying under a hot sun, in lands alternately flooded and drained, in the moving of earth rich in vegetable matter, and in the drying up under certain atmospheric conditions of stagnant pools. But what the poison was that produced those remittent and intermittent diseases which are known by the various names of marsh fever, malarial fever, fever and ague, and popularly as "chills" and "shakes," has at length been discovered by two scientists, Signor Tomasi, of Rome, and Prof. Kleb, of Prague. After spending three weeks in that fever-stricken region, the Roman Campagna, experimenting on its soils, its atmosphere, and its stagnant waters, they have succeeded in seeing the microscopic fungus, which, on being placed under the skins of healthy dogs, caused distinct and regular paroxysms of intermittent fever, and produced in the spleens of these animals that peculiar enlarged condition which is a recognized part of the pathology of this disease.

The report of their investigations and experiments, and the success that crowned them, was read a short time since in the Academy at Rome, and if further tests substantiate the truth of their discovery, the next series of experiments will have for their object the means whereby these poisonous fungi may either be destroyed or rendered innocuous. The practical agricultural remedy of draining and liming will probably remain the best remedy.

The discovery of the source of malaria in a minute fungus, discernible only under the microscope, merits the applause with which it has been received, and will strengthen very materially the belief in the germ theory of disease which has found in Tyndall one of its ablest advocates.

Wonders of the Telephone.—Capt. John E. Greer, U. S. A., shows how the flight of projectiles can be measured by the telephone, as follows: Hitherto the accurate determination of the time of flight of small-arm projectiles has been practically impossible at long ranges, owing to our inability to see them strike, even when firing over water. The discovery of the telephone has opened up to us a simple as well as novel means of obtaining the time desired, and has also afforded us the means of verifying the formulas by which these times were formerly deduced. In these experiments two telephones provided with Blake transmitters (a form of Edison's carbon telephone) were used. One was placed within a few feet of the gun and left open to receive and transmit the sound of the discharge. The other was in the shelter-proof, which was about thirty feet in front of the right edge of the target. A stop watch, beating fourths of a second, was used in connection with it. The telephone being at the ear, the instant the sound of the discharge was received at the target the watch was started, and, on the bullet striking, was stopped. A mean of a large number of observations, which rarely differed more than a quarter to half of a second from each other, gave the time of flight. The velocity of sound may be readily obtained with the telephone in the same manner.

Fusibility of Metals.—By means of extremely delicate processes, M. Violle has lately determined the fusing points of the more refractory metals. The following are given as the exact temperatures for five of these metals in the order of their fusibility: Silver, 1,749° Fah.; gold, 1,863°; copper, 1,890°; platinum, 3,195°; iridium, 3,510°. It will be seen that pure copper requires a higher temperature to fuse it than gold; ordinary commercial copper, however, melts below 1,035°. Iridium is the most difficult of all metals.

Nitrolin.—A new explosive compound, known as nitrolin, is compounded as follows: From 5 to 20 parts of sugar or syrup are mixed with from 25 to 30 parts of nitric acid in a wooden or gutta-percha vessel. Of this compound 25 to 30 parts are mixed with 13 to 35 parts of nitrate of potassa, and from 13 to 15 parts of cellulose.—*Chem. Centralblatt.*

It is recommended that the manufacturers of ammonia soda calcine it very thoroughly so that it may not contract further on ignition. Furstenau says that the great and unequal shrinkage which this soda sometimes undergoes at a red heat is the cause of the uncertain and unsatisfactory results when it is used in the manufacture of ultramarine.

When gun-cotton is decomposed in closed vessels it gives rise to products which are few in number and simple in character, namely, carbonic acid, carbonic oxide, hydrogen and nitrogen.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 31.		Week Ending Jan. 8.		Week Ending Jan. 15.		Week Ending Jan. 22	
Alpha	9½	8½	11½	10	11½	10	12	10½
Alta	3.15	2.60	4½	2.95	4.05	4⅜	5¼	4½
Andes	45c	30c	1	45c	80c	60c	1½	75c
Alps								
Argenta	1.15	1	1.55	1.30	1⅜	1.40	1½	1¼
Atlantic								
Aurora Tunnel								
Baltimore Con								
Belcher	4.10	2.90	6⅜		11	10½	5¼	13⅜
Belmont	85c	70c	1	70c	75c	65c	75c	60c
Best & Belcher	10⅜	10	14½	10⅜	13⅜	13	14½	13½
Bullion	3.70	3⅜	5	3.80	5	4.40	6⅜	5¾
Bechtel	1½	1.30	1⅞	1½	1.95	1.55	2	1.65
Belle Isle	1.45	1.30	1.55	1⅜	1.80	1½	1.90	1.60
Bodie	8½	9	9	8½	9	8½	8⅝	7
Benton	1¾	1.80	2.90	1.65	2.80	2.35	3¼	2.40
Bulwer	9¾	9¼	9¾	9	13	9½	12	10
Boyle								
Black Hawk	60c		1	45c	85c	60c	1	75c
Belvidere	75c		90c	1	75c	1¼	1	95c
Booker	45c		40c	50c	35c	50c	40c	65c
Caledonia	1¼	1.05	1⅜	1.45	1¾	1¼	2⅛	1.60
California	4.10	3.90	4.40	3.95	4.40	4¼	4.40	4.05
Challenge	1.90	1.70	2.10	1.80	2.05	1.90	2¼	2
Chollar	6	5¼	8	6	9¼	7¼	9⅜	8
Confidence	6⅞	6¼	8¼	7¼	8¾	8	9	8¼
Con Imperial	45c	35c	65c	45c	90c	55c	1	85c
Con Virginia	4	3⅞	5	4	4.60	4¼	4.90	4.05
Crown Point	2¾	2.40	4½	3.15	5¾	3.30	6⅞	5
Con Washoe					25c		30c	
Champion	15c	10c	20c		10c	20c	10c	25c
Concordia	50c		50c	25c				
Dayton								
DeFrees								
Daney	75c	65c	70c	65c	75c	65c	75c	65c
Eureka Con	16¾		16⅞	18	18	16¼	16¾	15¾
Exchequer	3	2¾	3¾	2.90	3.80	3.10	4.20	3¾
Endowment	60c	40c	40c	35c	50c	35c	60c	45c
Gen Thomas								
Grand Prize	1		1¼	1.15	1.70	1¼	1.55	1.40
Gila	10c		10c		15c	5c	15c	10c
Golden Chariot								
Golden Terra	12	10	11	10½	10½	9	10½	9
Goodshaw			35c	15c	50c	35c	40c	
Gould & Curry	5¾	4⅝	7	5¾	6¾	5⅞	7	6¼
Halo & Norcross	6¾	6	9¼	6¾	9	8⅜	8⅞	8¾
Hillside	1.40		1¾	1.40	2.05	1⅞	1¾	
Highbride								
Homestake								
Hussey								
Independence	1		1	1	1.10	75c	90c	75c
Julia	2	1.55	2.60	1.95	2.25	2¼	3¼	2.55
Justice	1.70	1¼	2.60	1⅞	2¼	2	3.40	2¼
Jackson			3¾		3¾			
Joe Scates								
K K Con					5	4¾		
Kentuck	3	2¾	4¼	3.30	4.10	3.30	4.20	3.90
Kossuth								
Keystone								
Lady Bryan	20c	5c	30c	15c	1.45	40c	3¼	25c
Lady Wash	50c	45c	85c	50c	75c	65c	1.15	80c
Leopard	15c		10c		10c		20c	15c
Leviathan	45c	30c	40c	30c	40c	30c	50c	40c
Leeds			50c		80c	60c	75c	50c
Lee								
May Belle			15c	10c	30c	20c	40c	20c
Modoc								
Manhattan	1¼		1.80	1⅞	2	1¼	1.90	1¼
Martin White	60c	50c	75c	60c	1.40	45c	1.40	1¼
McClinton	50c	40c	50c	40c	1	50c	75c	65c
Meadow Valley								
Mexican	18	15¾	22½	17½	21¼	19¾	19¾	17½
Mides								
Morning Star								
North Con Virginia								
New York	35c	20c	50c	30c		30c	75c	45c
Northern Belle	6¾		8	6¾	10¼	9¼	9¾	
New Coso								
Navajo	25c		75c	25c	40c	35c	40c	35c
Occidental	1	60c	1.60	1	2.05	1¾	2	1¾
Ophir	20	17	21¼	19¼	21	19¼	20	17¾
Oriental				15c	80c	55c	90c	70c
Overman	6¾	5¾	8¾	7	9¼	7¾	10	8¼
Panther								
Phenix								
Phil Sheridan								
Potosi	3	2.80	4¼	3	5¾	4	5¼	4.90
Prospect								
Raymond & Ely	90c		1	90c	1	95c	1	80c
Richer								
Rock Island								
Rye Patch								
Rough & Ready								
Savage	6	4.35	7¾	5¾	7¼	6¼	8	7¾
Seg Belcher	14	11	19	15	23¼	16	25	21
Sierra Nevada	18¼	17	27	18¾	22¾	20¼	24	20¼
Silver Hill	1	70c	1	75c	90c	75c	2	95c
Silver King	7	6¼	7¾	7	7	6¼	7¾	6¾
Silver Prize								
Succor								
Summit			1¼	80c	1¼	1	1.40	1
Scorpion	3	2.60	4.15	2.85	3.30	3.20	3.95	3.40
Solid Silver							50c	20c
South Bodie			25c	20c	20c	15c	25c	15c
South Standard								
Star	10c		10c		25c	15c	30c	20c
St. Louis							50c	15c
Syndicate	1.40	1	1¼	1¼	1¼	1	2	1¼
Tioga Con	2.20	2.10	2¾	2¼	3.35	2.45	3.40	2.90
Tiptop	2	1.90	3	2	4	3¼	3¾	3¼
Trojan							5c	5c
Union Con	41¾	38¾	50	40¾	51¼	45¾	47	44
Utah	9	8	13¾	9¾	12¾	11¼	17⅜	12¾
Vermont Con								
Ward	1.05	1	1¼	1	2¼	1.40	2.85	2.40
Wells-Fargo			10c		10c		15c	10c
Woodville								
White Cloud								
Yellow Jacket	9¼	8¾	12¼	9¾	11¾	10¼	13¼	10¾

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 16.

1115 Andes.....80@75c
130 Alpa.....11
340 Alta.....4½@4¾
105 Best & Belcher..13½@13¾
1785 Bullion.....67½@68
2020 Belcher.....9¼@9½
560 Benton.....2.90@2.
700 Cosmopolitan.....50c
40 Confidence.....8¾
385 California.....4.30
1785 Crown Point.....5¼@5
605 Con Virginia.....3¾
175 C Dorado.....1¾
300 Con Washoe.....30c
1050 Con Imperial.....90@90c
445 Caledonia.....1.60@1¾
525 Chollar.....8¾
20 Challenge.....2
250 Dardanelles.....90c
565 Exchequer.....3.95@4
3200 Flowery.....3.45@3.50
400 Fairfax.....75c
970 Golden Gate.....3@2.70
140 Gould & Curry.....6¾@6¾
185 Halo & Nor.....8¼@8¾
150 Justice.....2.55@2.50
1115 Julia.....2
215 Kentuck.....4.15
2100 L Bryan.....2¼@2.40
635 Leviathan.....40c@50c
150 Lady Wash.....80@85c
540 Mexican.....19½@19¾
825 Mackey.....10c
1350 New York.....75c@70c
3690 N Bonanza.....70c@75c
295 Occidental.....1.90@1¾
35 Overman.....8¼@8½
465 Ophir.....15½@15¾
785 Potosi.....5¼@5½
20 Seg Belcher.....21¼@21
125 Savage.....7¾@7
565 Scorpion.....3¼@3.20
565 Sierra Nevada.....23@23¾
2325 Silver Hill.....1½@2
100 Solid Silver.....20c
210 Utah.....12@12½
620 Syndicate.....1.85@2
305 Silver King.....7@6¾
2790 S Bulwer.....1¼@1¾
200 S Bodie.....20c
250 S Noonday.....1½
100 Summit.....1½
750 Star.....25c
340 Tiptop.....3½
100 Tuscarora.....20c
235 Tioga Con.....3@2.90
250 University.....25c
400 Vortex.....25c
230 Wales.....3¼@3.05

Saturday A.M., Jan. 17.

805 Argenta.....1.40@1.30
100 Alpa.....11
580 Alta.....4½@4.60
1325 Andes.....90c@1
100 Alpha.....12
330 Best & Belcher..14@14½
310 Belcher.....12@13
100 Belmont.....70c
800 Bullion.....6¾@6¾
905 Benton.....2.90@3
220 Belle Isle.....1½
115 Bodie.....7@6¾
610 Bechtel.....1.80@1.90
1350 Cosmopolitan.....50@40c
370 Confidence.....8¾@
400 Con Dorado.....1.85@
340 Con Imperial.....70c
290 Exchequer.....4@4.20
170 Eureka Con.....15½
1450 Endowment.....50c
650 Golden Gate..2.85@3.05
20 Keutuck.....4.10
650 Leviathan.....45@50c
1165 L Wash.....1@1.15
100 Leopard.....2.70
4005 Lady Bryan.....2@1.30
570 Metallic.....1.35@1½
950 May Belle.....30@35c
100 McClinton.....65@75c
55 Mt Diablo.....15@15½
140 Manhattan.....1.85@1.90
2850 Mackey.....10@15c
290 Mexican.....19½@19¾
750 New York.....75@70c
200 Navajo.....40c
220 Northern Belle.....9@8¾
2535 N Bonanza.....1@1.45
890 Oriental.....75c
180 Occidental.....1.90@1.85
370 Overman.....9¼@10
135 Ophir.....19½@20
90 Paradise.....1½
260 Potosi.....5¾
100 Raymond & E.....1
250 Summit.....1.20@1.10
110 Savage.....2.
150 St Louis.....50@45c
250 Sierra Nevada.....24@23¾
200 Syndicate.....1.85
100 Star.....25c
55 Seg Belcher.....24@25
400 Solid Silver.....30@25c
445 Scorpion.....3.45@3.
1350 Silver Hill.....1¼@1.40
810 Tioga.....3
100 Trojan.....5c
340 Union Con.....47@46
160 Utah.....13@12¾
200 Wells-Fargo.....13½
310 Ward.....2.80@2.85
180 Wales.....3.10
850 Yellow Jacket..11¾@11¼

Monday A. M., Jan. 19.

200 Alpha.....10¾@11
400 Alta.....5¾@5¾
1260 Andes.....3.10@3
930 Benton.....3.10@3
545 Bullion.....6¾@6¾
4410 Belcher.....12½@13
250 Best & Belcher..13¾@14
920 California.....4¼@4.30
10 Confidence.....8¾@
1500 Con Imperial..1@1.05
1990 Crown Point.....6¾@6¾
935 Caledonia.....2@2
1930 Con Virginia..4.30@4.05
700 Chollar.....8¾@8¾
1300 Cosmopolitan.....50@55c
770 Challenge.....2.20
250 Dardanelles.....1
280 Exchequer.....4.15@4
2320 Flowery.....50@60c
420 Golden Gate..2.80@2.85
490 Gould & Curry.....6¾@7
436 Hale & Nor.....8¾
1075 Justice.....3@3.40
1855 Julia.....2.90@3
215 Kentuck.....4.20@4.15
650 Leviathan.....45c
1240 Lady Wash.....1.10@1.15
1320 Lady Bryan..1.85@1.65
655 Mexican.....18½@19
2290 Mackey.....20c@15c
1950 N Bonanza.....1@1.05
1300 New York.....65c@70c
530 Overman.....10@9¾
390 Ophir.....19@18¾
50 Occidental.....1.90
615 Potosi.....5¼@5¾
70 Seg Belcher.....24@23¾
370 Savage.....8@7¾
1005 Sierra Nevada.....22@20
630 Scorpion.....3.95@3
200 Solid Silver.....10¾
535 Silver Hill.....1¼@1.60
1600 Tiptop.....3¾@3¾
195 Utah.....14¼@14¾
715 Union Con.....45@45¾
1100 Wells-Fargo.....15c
1120 Ward.....2.65@2.85
565 Yellow Jacket..13@13¼

AFTERNOON SESSION.

350 Addenda.....60@70c
1450 Argenta.....1.45@1.35
600 Atlas.....15c
250 Albion.....25c
1100 Benton.....2.85@3
210 Belle Isle.....1¼@1.65
50 Black Hawk.....75c
500 Booker.....65@60c
130 Bulwer.....11¼
200 Bodie.....7¾@8
2700 Belcher.....2.05@1.90
500 Belvidere.....1¼@1.45
3800 Champion.....50@40c
400 Caledonia (B H).....3¼
25 C Pacific.....5
2600 Dudley.....60@70c
600 Day.....70c
1100 Endowment.....50c
305 Eureka Con.....16@16¼
885 Grand Prize.....1¼@1.40
2270 Gila.....15@20
395 Goodshaw.....40c
520 Hillside.....12
230 Independence.....75c
385 Jupiter.....1.40@1¼
200 Leopard.....20@15c
100 Manhattan.....1¾
20 Manhattan.....1¾
470 Metallic.....1¾
540 Mono.....8½@8¾
100 M White.....11
250 McClinton.....75c
115 Mt Diablo.....15¾
1800 Mammoth.....2@1.95
440 Noonday.....5
630 N Noonday.....3.80@4
200 Navajo.....30c
780 Northern Belle.....9¼@10
100 Oriental.....75c
100 Paradise.....90c
1200 Queen Bee.....35@30c
150 Real del Monte..1½@1.30
210 Raymond & E.....1
320 Silver King.....7@7¼
1115 S Bulwer.....1¼
100 Star.....30c
145 Syndicate.....1¾
850 S Bodie.....20@15c
180 Summit.....1.40@1¼
1010 Tioga Con.....3¼@3.40
200 Tiptop.....3.30@3¾
150 University.....25c
70 Wales.....3@3.05

Tuesday A. M., Jan. 20.

185 Alpha.....11
1125 Andes.....1¼@1
60 Best & Belcher.....13¾
1010 Bullion.....5¾@6
2710 Belcher.....9¼@9
350 Benton.....2.80@2.70
200 Cosmopolitan.....50c
70 Confidence.....8¾
95 California.....4.10
550 Con Imperial.....85c
20 Con Dorado.....2.05
1360 Crown Point.....5¼@5¾
1230 Con Virginia..4.10@4.20
1150 Chollar.....8¾@8¾
600 Challenge.....2.10@2.20
375 Exchequer.....3.80@3¾
2480 Flowery.....50@60c
2300 Gould & Curry.....6¾@6¾
1240 Golden Gate.....2.80@3
50 H & Norcross.....8¼
125 Justice.....3¼@3.05
225 Kentuck.....4@4.10
100 Leviathan.....45c
500 L Bryan.....3.20@3¼
985 Lady Wash.....95c@1
310 Mexican.....17@17½
4500 Mackey.....25@30c
400 N Bonanza.....1¼@1.20
2050 New York.....45@60c
1000 Ophir.....17½
2220 Occidental.....1.90@2
285 Overman.....9¼@9
315 Potosi.....5¾@5¾
200 Savage.....7¾@7¾
100 Seg Belcher.....21
1010 Silver Hill.....1¼@1.35
100 St Louis.....25c
265 Sierra Nevada.....21@21¼
590 Scorpion.....3.60@3¼
100 Trojan.....5@10c
1590 Union Con.....43@43¼
1700 Wells-Fargo.....15@10c
950 Ward.....2¼
675 Yellow Jacket.....12@12¾

AFTERNOON SESSION.

470 Albion.....25c
650 Addenda.....65c
2105 Argenta.....1¼@1.40
180 Bodie.....8@8¾
230 Belmont.....60c
2010 Booker.....25@30c
1910 Bechtel.....2@1.90
200 Boston.....1¼@1.30
230 Black Hawk.....90c@1
1250 Belvidere.....1¼@1¼
80 Bulwer.....11¼
1010 Champion.....50@40c
75 C Pacific.....4¼@4¾
100 Caledonia (B H).....3¼
430 Dudley.....70@75c
100 Endowment.....55c
330 Grand Prize.....1¼@1.55
1130 Goodshaw.....40c
50 Golden Terra.....10¼
320 Independence.....75c
300 Jupiter.....1.30@1¼
2010 Leopard.....20c
515 Leeds.....50c
915 Martin White..1¼@1.35
50 Mt Diablo.....16
100 Manhattan.....1¼
250 McClinton.....75c
2530 Metallic.....1½
895 Mammoth.....2@2¼
750 May Belle.....25c
480 Mono.....9@8¾
820 Noonday.....5@4.90
80 N Noonday.....3.80
175 Navajo.....35c
160 Northern Belle....9¼@9¾
220 Oriental.....75@85c
250 Oro.....20c
600 Queen Bee.....35@30c
375 Raymond & E.....50@51
145 Syndicate.....1.90@2
10 Summit.....1
300 S Noonday.....1¼@1.80
650 S Bodie.....20c
900 Star.....20c
360 Silver King.....7@7¼
1345 S Bulwer.....1.40@1¼
350 Tioga.....3¼@3.20
375 Wales.....3¾@3.05

Wed'day A.M., Jan. 21.

35 Alpha.....11¼@11¾
95 Alta.....5¼@5¾
230 Andes.....1.10@1.20
3365 Belcher.....10¼@10¾
440 Bullion.....5¾@5¾
110 Best & Belcher..13¾@13¾
120 Benton.....2.80
565 California.....4.20@4.15
1000 Con Imperial.....2.10@2.20
195 Con Virginia..4.¼@4.20
875 Chollar.....8¼@8¾
1360 Crown Point.....5¾@5¾
360 Confidence.....8¼@9
1300 Con Dorado.....2@1.95
400 Con Imperial.....90@85c
900 Challenge.....2.15@2¼
100 Dardanelles.....95c
190 Exchequer.....3.90@3¾
2545 Flowery.....55c
4100 Gila.....15c
200 Gould & Curry.....6¾@6¾
500 Golden Gate.....2.70@2¾
405 Julia.....2.90@2.80
695 Justice.....3¼@3.20
310 Kentuck.....4@4.10
1300 Leviathan.....45c
215 L Bryan.....2¼@1.95
925 Lady Wash.....90c@1
2935 Mackey.....30@25c
240 Mexican.....19¼@19¾
1000 N Bonanza.....1¼@1.20
500 New York.....55c@60c
50 Occidental.....1¾
170 Ophir.....19¾
130 Overman.....9¼@9¾
515 Potosi.....5¾@5¾
150 Savage.....7¾@7¾
320 Sierra Nevada.....22@22¼
30 Seg Belcher.....21@21¾
310 Scorpion.....3¾@3¾
340 Solid Silver.....50c
550 St Louis.....20@15c
1650 Trojan.....5c
525 Utah.....17@17¾
425 Union Con.....44
2100 Wells-Fargo.....15c
600 Ward.....2.80@2.85
400 Yellow Jacket..12¼@12¾

AFTERNOON SESSION.

1385 Argenta.....1¼@1.05
1000 Atlas.....15c
2020 Albion.....25@30c
300 Bodie.....8¼@8¾
1345 Bechtel.....1.90@1.95
550 Belmont.....60@70c
160 Belle Isle.....1.60@1¼
430 Boston.....1¼@1.30
1100 Bullion.....6¾
450 Booker.....45c
315 Belvidere.....1¼
150 Black Hawk.....90c@85c
1570 Champion.....25@35c
50 Con Pacific.....4¾
750 Day.....70@65c
200 Dudley.....75c
1500 Endowment.....55@50c
60 Grand Prize.....1.55
145 Hillside.....1¼@1.40
250 Independence.....90c
500 Jupiter.....1.30@1¼
100 Leeds.....50c
800 Leopard.....20c
210 McClinton.....75@70c
65 Mt Diablo.....16
200 May Belle.....25@20c
300 Mammoth.....2@2¼
1750 Mackey.....10@15c
1010 Bullion.....5¾@6
620 Benton.....2@2.35
235 California.....4.30
255 Con Virginia..4.45@4.40
950 Chollar.....8¾@8¾
1040 Crown Point.....5¾@5¾
445 Con Imperial.....90c@85c
70 Confidence.....8¾@8¾
125 Caledonia.....1.60@1.70
925 Challenge.....2@1.95
150 Cosmopolitan.....45c
450 Dorado.....1.80@1.75
200 Dardanelles.....90c
305 Exchequer.....3.70@3.60
600 Flowery.....35c
600 Fairfax.....80@75c
1000 Gould & Curry.....6¾@6¾
1450 Golden Gate.....2.75
270 Hale & Nor.....8¼@8¾
415 Julia.....2.40@2.35
210 Justice.....2¼
610 Keutuck.....4@4.10
2385 Lady Bryan..1.20@1.15
675 Leviathan.....40c
470 Lady Wash.....70@75c
820 Mexican.....20c@19¾
200 Mackey.....10c
1300 New York.....45c@50c
635 N Bonanza.....65c@60c
160 Ophir.....20
125 Overman.....8¼@8
325 Occidental.....2
1050 Potosi.....5¾@5¾
155 Savage.....7¾
710 Sierra Nevada..22¼@21¾
875 Silver Hill.....80c@90c
275 Scorpion.....3.30c@3¼
330 Utah.....11¾@12
115 Mt Diablo.....15¾
500 Wells-Fargo.....10c
310 Ward.....2.10
590 Yellow Jacket..10¾@10¼

AFTERNOON SESSION.

450 Argenta.....1.45@1.35
1175 Addenda.....60@55c
100 Atlas.....10c
100 Oro.....20c
750 Queen Bee.....35@30c
110 Raymond & E....80@90c
300 Star.....30c
1175 Sierra Nevada.....24@23¾
1345 S Bulwer.....1.40@1¼
350 Tioga.....3¼@3.20
375 Wales.....3¾@3.05

Thursday A.M., Jan. 15. Thursd'y A. M., Jan. 22.

715 Alta.....4¼@4.20
510 Andes.....70@75c
40 B & Belcher.....13¼@13¾
2005 Belcher.....9¼@9
1015 Bullion.....5¾@6
410 Bullion.....6@5¾
535 Benton.....2.60@2.40
550 Con Imperial.....85c@90c
100 Con Virginia..4.15@4.20
1040 Crown Point.....5¾@5¾
50 Confidence.....8¼
830 Challenge.....2.20@2.15
170 Caledonia.....2@1.95
375 Crown Point.....5¾@5¾
135 California.....4.10@4.05
140 Cosmopolitan.....50c
450 Con Dorado.....2.10
105 Dardanelles.....90c
105 Exchequer.....3¾
950 Flowery.....20@30c
1450 Golden Gate.....2¾
165 Gould & Curry.....6¾
450 Golden Gate.....2¾
90 Hale & Nor.....8¼@8¾
525 Justice.....2¼@2¾
345 Julia.....2.60
400 Yellow Jacket..12¼@12¾

AFTERNOON SESSION.

1700 Alta.....1.05
1700 Andes.....1.10@1.20
1700 Belcher.....10¼@10¾
1700 Bullion.....6¾@6¾
1700 Benton.....2.35@2.40
1700 Crown Point.....5¾@5¾
1700 Con Virginia..4.15@4.20
1700 Chollar.....8¾@8¾
1700 Gould & Curry.....6¾@6¾
1700 Julia.....2.60@2.55
1700 Mexican.....19¾@19¾
1700 Ophir.....19¾@19¾
1700 Potosi.....5¾@5¾
1700 Sierra Nevada.....24@23¾
1700 Union Con.....44@43¾
1700 Yellow Jacket..12¼@12¾

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	2	20 Dec 10	Jan 14	Feb 3	T H Dixon	238 Montgomery st
Alta S M Co	Nevada	16	50 Dec 18	Jan 22	Feb 10	W H Watson	302 Montgomery st
Andes S M Co	Nevada	13	25 Dec 13	Jan 23	Feb 16	B Burris	Nevada Block
Bechtel Con M Co	California	4	25 Dec 22	Jan 30	Feb 9	W H Lent	Nevada Block
Belvidere M Co	California	5	25 Dec 18	Jan 27	Feb 21	C V D Hubbard	203 Bush st
Best & Belcher M Co	Nevada	16	1 00 Nov 5	Dec 23	Jan 19	Wm Willis	309 Montgomery st
Booker Con G M Co	California	4	20 Dec 30	Feb 4	Feb 24	W H Leut	309 Montgomery st
Caledonia M Co	Black Hills	5	50 Dec 18	Jan 27	Feb 12	—	6 & 7 Stock Ex
Champion M Co	California	5	20 Dec 24	Jan 30	Feb 20	J Crockett	302 Bush st
Con. Imperial M Co	Nevada	10	20 Dec 10	Jan 14	Feb 4	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	40	50 Jan 15	Feb 19	Mar 11	J Newlands	203 Bush st
Double Standard M Co	California	2	15 Dec 10	Jan 14	Feb 4	W H Lent	309 Montgomery st
El Tesoro	California	8	25 Dec 15	Jan 30	Feb 16	W H Chickering	214 Sansome st
Europa M Co	Nevada	8	10 Dec 30	Feb 3	Mar 6	J L Fields	240 Montgomery st
Exchequer M Co	Nevada	15	50 Jan 13	Mar 9	Mar 29	C F Elliott	327 Pine st
Gila S M Co	California	6	25 Jan 15	Feb 7	Mar 9	W W Parrish	328 Montgomery st
Goodshaw M Co	California	2	25 Nov 24	Jan 5	Feb 2	V Fernbach	327 Pine st
Gould & Curry S M Co	Nevada	37	1 00 Jan 6	Feb 11	Mar 4	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	63	1 00 Jan 14	Feb 19	Mar 11	J F Lightner	309 Montgomery st
Independence M Co	Nevada	5	30 Jan 13	Feb 17	Mar 9	E M Hall	327 Pine st
Leeds M Co	Nevada	3	50 Jan 21	Feb 23	Mar 11	R L Thomas	411½ California st
Justice M Co	Nevada	30	50 Nov 29	Jan 3	Jan 24	R E Kelly	419 California st
Lady Bryan M Co	Nevada	4	50 Dec 27	Jan 30	Feb 28	—	203 Bush st
Lady Washington Con M Co	Nevada	1	20 Dec 22	Jan 26	Feb 14	W H Watson	302 Montgomery st
Mammoth M Co	California	3	1 00 Dec 5	Jan 15	Feb 13	A W Field	302 Montgomery st
Martin White M Co	Nevada	5	50 Dec 10	Jan 12	Feb 3	J J Scoville	309 Montgomery st
Mackey G & S M Co	Nevada	2	15 Jan 3	Feb 7	Feb 26	J M Buffington	303 California st
Mexican M Co	Nevada	10	2 00 Jan 10	Feb 13	Mar 4	C L McCoy	203 Bush st
Mono M Co	California	6	50 Dec 22	Jan 26	Feb 16	—	62 Nevada Block
Mountain View S M Co	Nevada	1	25 Dec 31	Feb 10	Feb 28	J Moore	309 California st
North Bonanza M Co	Nevada	4	25 Nov 21	Jan 9	Jan 30	W W Stetson	309 Montgomery st
North Carson S M Co	Nevada	9	25 Dec 13	Jan 15	Feb 5	G Roberts	113 Leidesdorff st
Original Gold Hill G & S M Co	Nevada	8	15 Dec 20	Jan 26	Feb 14	J M Buffington	309 California st
Real del Monte M Co	Nevada	9	25 Dec 1	Jan 3	Jan 24	C V D Hubbard	203 Bush st
Scorpion S M Co	Nevada	6	25 Jan 6	Feb 10	Mar 2	G R Spinney	310 Pine st
Senator M Co	Nevada	1	10 Dec 22	Jan 24	Feb 21	L Reynolds	317 Mission st
Sierra Nevada S M Co	Nevada	61	3 00 Jan 6	Feb 11	Mar 3	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	9	50 Jan 2	Feb 5	Feb 26	W E Dean	203 Bush st
South Bodie G M Co	California	2	10 Jan 16	Feb 18	Mar 10	—	309 Montgomery st
South Bulwer M Co	California	6	25 Jan 20	Feb 24	Mar 17	W Stuart	320 Sansome st
South Utah M Co	Nevada	4	10 Dec 22	Jan 24	Feb 13	W S Hinkle	207 Sansome st
Trojan M Co	Nevada	12	25 Dec 23	Jan 26	Feb 16	D Wilder	328 Montgomery st
Utah S M Co	Nevada	2	00 Dec 18	Jan 21	Feb 9	C G Pratt	309 Montgomery st
Wells Fargo M Co	Nevada	13	10 Nov 17	Jan 12	Jan 30	A Colburn	10 Leidesdorff st
Ward G & S M Co	Nevada	5	40 Dec 10	Jan 16	Feb 5	Jacob Stadtfeld	419 California st
Yellow Jacket S M Co	Nevada	35	1 00 Dec 19	Jan 23	Feb 23	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Ætna M Co	Arizona	1	05	Dec 23	Jan 29	Feb 18	J S Benear	420 Montgomery st
Albion M Co	—	1	10	Jan 15	Feb 27	Mar 26	—	7 Stock Exchange
Atlanta M Co	Utah	1	05	Dec 23	Jan 29	Feb 13	A F McGrew	420 Montgomery st
Black Rock M Co	California	1	03	Dec 16	Jan 20	Feb 24	N T Root	227 Bush st
Giant and Old Abe M Co	—	3	50	Nov 21	Dec 31	Feb 10		49 Nevada Block
Gover M & M Co	California	40	10	Dec 24	Mar 1	Mar 1	W O Wilson	402 Front st
Hazard Grav M Co	California	4	03	Dec 2	Jan 5	Jan 25	J T McGeoghehan	318 Pine st
Hcadlight M Co	California	1	15	Dec 4	Jan 17	Feb 12	A W Field	302 Montgomery st
Ivanpah M & M Co	California	1	10	Jan 19	Feb 23	Mar 11	F J Friedlander	309 California st
North Sonora G M Co	California	1	10	Jan 13	Feb 20	Mar 20	F R Bunker	606 Montgomery st
Liberty Hill Con M & Water Co	Cal	1	60	Dec 30	Jan 16		J W Pew	310 Pine st
Mariposa Land and M Co	California	17	50	Dec 10	Jan 10	Feb 2	L Leavitt	309 Montgomery st
Maybelle Con M Co	California	4	05	Dec 13	Jan 19	Feb 10	W J Taylor	310 Pine st
Mayflower Grav M Co	California	7	10	Jan 19	Feb 23	Mar 16	J Morizio	328 Montgomery st
Monte Christo Con G M Co	California	2	10	Dec 22	Jan 26	Feb 20	B Burris	Nevada Block
Butte Creek Hydraulic M Co	California	4	15	Dec 31	Feb 5	Feb 25	R L Taylor	230 Montgomery st
Quartz Mountain G M Co	California	8	50	Dec 1	Jan 5	Jan 26	E Hestres	729 Montgomery st
Rocky Point M Co	California	2	10	Jan 14	Feb 20	Mar 11	A C Taylor	314 Bush st
Requiza M Co	California	1	05	Nov 24	Jan 7	Jan 28	—	320 Sansome st
Star M Co	California	3	10	Dec 10	Jan 15	Feb 10	—	320 Sansome st
Telhurium G & S M Co	California	20	10	Dec 3	Jan 7	Jan 29	J M Litchfield	415 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Belcher S M Co	Nevada	J Crocket	203 Bush st	Annual	Jan 27
Cataract and Wide West H G M Co	Cal	W B Lake	261 Kearny st	Special	Jan 28
Champion M Co	Nevada	J Crockett	203 Bush st	Special	Jan 31
Con Esmeralda M & M Co	Nevada	A Meyers

410 Justice	3.15@3.1	90 Chollar	.8[illegible]@8[illegible]
120 Lady Bryan	2[illegible]@2.95	180 Crown Point	.5[illegible]@5.80
230 Lady Wash	.90c	100 Con Imperial	.90c
90 Mexican	.19½@19	300 Cosmopolitan	.50c
200 Mackey	.35c	10 Caledonia	.2.05
90 New York	.50c@45c	50 Endowment	.60c
400 N Bonanza	.1.20	50 Flowery	.50c
40 Overman	.9[illegible]	50 Gould & Curry	.61[illegible]
130 Ophir	.19c@19½	100 Julia	.2[illegible]
60 Potosi	.5[illegible].45	170 Justice	.3[illegible].80
300 Savage	.7½@7[illegible]	100 Lady Wash	.9[illegible]
40 S Nevada	.22	180 L Bryan	.1[illegible].10
60 Silver Hill	.1.20@1.[illegible]	200 Mammoth	.2[illegible].05
100 Trojan	.6[illegible]	20 Mexican	.18½
50 Union Con	.44	100 Mono	.8½
20 Utah	.17½@17½	50 New York	.55c
570 Yellow Jacket	.12½@12½	100 Nob Hill	.25c
AFTERNOON SESSION.		50 Potosi	.5[illegible]
800 Atlanta	.8c	180 Silver Hill	.1.10
400 Attua	.7c	20 Sierra Nevada	.22
20 Andes	.1[illegible]	300 Trojan	.6c
170 Alta	.5[illegible]@5[illegible]	20 Utah	.16½
110 Belcher	.10c@10[illegible]	100 Wells Fargo	.15c
50 California	.4[illegible]	30 Yellow Jacket	.12[illegible]@12½

California Board—Latest Sales.

Wed'sday A.M., Jan. 21.			
200 Atlantic	.7c	70 Utah	.18@18[illegible]
50 Andes	.1.30	40 Union	.43½@43[illegible]
100 Addenda	.60c	140 Ward	.2.70@2.65
80 Arcenta	.1[illegible]	20 Yellow Jacket	.12[illegible]
40 Alpha	.11[illegible]@11[illegible]	AFTERNOON SESSION.	
95 Alta	.5[illegible]@5[illegible]	220 Arcenta	.1[illegible].20
400 Black Hawk	.90c@95c	30 Alpha	.11[illegible]@11[illegible]
100 Belcher	.10[illegible]@10[illegible]	95 Alta	.5[illegible]@5[illegible]
40 Best & Belcher	.13½@13[illegible]	210 Belcher	.9[illegible]@9[illegible]
60 Bullion	.5[illegible]@5[illegible]	30 Bullion	.5[illegible]
130 California	.4.20@4[illegible]	20 California	.4.15
145 Con Virginia	.4.15@4[illegible]	30 Con Virginia	.4.20
200 Con Imperial	.1[illegible]	250 Con Imperial	.95c@1[illegible]
100 Crown Point	.6[illegible]@6[illegible]	20 Crown Point	.5[illegible]
130 Chollar	.8[illegible]@8[illegible]	35 Caledonia	.2[illegible]
80 Caledonia	.2[illegible]@2.30	100 Enterprise	.1[illegible]
235 Endowment	.55c	30 Exchequer	.3[illegible]@3.70
40 Exchequer	.3.95@4	50 Gould & Curry	.6[illegible]@6[illegible]
220 Goodahaw	.42c@40c	110 Julia	.2.90
20 Gould & Curry	.61	120 Justice	.3.10
120 Justice	.3.05	40 Kentuck	.4
100 Leviathan	.50c	30 Mexican	.18[illegible]
250 Mint	.9c	180 N Bonanza	.1.15
300 Mackey	.36c	200 New York	.55c@50c
40 Mexican	.19c@19½	20 Ophir	.19½
100 N Sierra Nevada	.7c	20 Overman	.9½
320 New York	.55c@50c	20 Potosi	.4.90
20 Ophir	.19½	20 Savage	.7½
30 Potosi	.5[illegible]	60 Sierra Nevada	.21[illegible]@21[illegible]
30 Savage	.7[illegible]@7[illegible]	600 Trojan	.7c@5c
40 Sierra Nevada	.22[illegible]@22½	40 Union Con	.43½@43[illegible]
100 Trojan	.7c@8c	40 Utah	.17½@17[illegible]
		440 Wells Fargo	.16c@15c
		40 Yellow Jacket	.12c@11½

Mining Share Market.

The transactions during the past week have held a firmer tone than for some time past. The amount of sales is evidently on the increase, and though, with a few marked exceptions, there has been material advance, there is certainly greater confidence as to the future. The general outlook from the mines is full of promise for a prosperous season. It is from this cause that outside stocks are attracting attention, even from cautious buyers. The developments in many of the class of mines, which the outside stocks represent, are so favorable that they must ultimately come to the front and assume a popular position. It would be invidious, among so many mines of this character, to name any of them; by doing so, and omitting other equally entitled to notice, an injustice would be done to the latter. But it is certain that from all sections of this coast well authenticated statements are continuously received of rich developments being made and rich discoveries consummated. The shipments of bullion are evidences of increasing yield of the mines. Under this favorable state of mining, it is not likely that any severe depreciation in sound stocks can occur. On the contrary, there will be, in good stocks, a gradual and healthy advance in price. There will be fluctuations, but the recede will be temporary, while the advance will be, in the main, continuous.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Eureka Con., Jan. 13, two days past, $63,620 lbs.; Jan. 14, 34,680 lbs.; Jan. 18, total, past week, 227,020 lbs; Wells, Fargo & Co., at Eureka, Jan. 16, $1,000; Jan. 18, $4,377.24; Jan. 18, total, past week, $18,212.06; at Silver Reef, Jan. 10, for one week, $29,773; Tyho Con., Jan. 1 to Jan. 8, $6,000; Stormont, Jan. 10, $7,539.50; Bodie, Jan. 12, $13,329; Standard, Jan. 12, $41,680.48; Noonday, Jau. 12, $8,000; Hannington & Mellor, Jan 16, $4,500; Belmont M. Co., Jan. 12, $2,570.96; Jan. 16, $1,960.35; Bartell M. Co., Jan. 8, $1,784.12; Tyho, Jan. 16, since last report, $3,190; Richmond Con., Jan. 18, during past week, $25,836.61; McMillen S. M. Co., Jan. 11, $2,260; Jan. 13, $4,783; Jan. 16, $1,913.71; Eaton & Bailey, Jan. 13, $1,183.95; B. Weisl & Co., Jan. 13, $1,742.83; Argenta, Jan. 19, $14,400; Leopard, Jan. 19, $3,818.

TYLER'S HAY UNLOADER.—Jerry Tyler, of Milford, Lassen county, exhibited his hay and grain unloader, stacker, barn filler and distributer, Saturday, Jan. 10th, in front of the Stewart House, Susanville. Quite a crowd assembled to examine its workings and discuss its utility, and all pronounce it a success. The hay or grain is taken up in a net, and easily carried to the top of the stack or barn, where it is neatly emptied and distributed. One man and one horse and a hoy can accomplish in a moment what would require an hour's hard work for three men in pitching hay into a barn or upon a high stack. Mr. Tyler will start next week for Reno, and will give exhibitions of its working along the route, thence to San Francisco, where he will have castings made, when he will return and canvass the county for the sale of farm rights. Every man who puts up 50 tons of hay each year can save money by buying one, for they will last for years. Its simplicity is its greatest recommendation.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

DOWNS.—Amador *Ledger*, Jan. 17: Drifting has been on a small vein of very rich ore. At 250 ft a crosscut was run and a large body of rich quartz was found. It has been cut into six ft without getting through it. It is the richest strike in the county off the mother lode.

MELLO MINE.—Work has commenced and the ore assays $30 per ton. The quantity of ore is large.

EL DORADO.

ESPERANZA.—*Democrat*, Jan. 17: The crosscut is in the vein 41 ft, without reaching the hanging wall; all good milling ore. That mine is bonded to a San Francisco company for $30,000.

INYO.

ANTELOPE.—*Independent*, Jan. 17: A two-ft ledge of ore has been struck in one of the principal mines of Antelope district, nearly opposite Bishop creek.

MARIN.

NEW MINE.—An assay of ore from a mine near San Rafael, by C. F. Kirchner, yielded $15 per ton of silver, $3 of gold and 10% of copper. The specimen assayed was picked up by himself as a fair sample of a large amount of croppings. Copper ore containing 10% is valuable without gold or silver.

MONO.

GLENN-DALE CON.—Bodie *News*, Jan. 16: It is on Silver hill; it contains 2,684 ft. ft has three shafts—two inclines, one vertical. The main incline, 506 ft from the south end is down 125 ft, cutting a fissure six ft wide, assaying well. The other incline is sunk 75 ft, following the ledge, which is five ft with 16 inches of very rich ore. The vertical shaft is 60 ft with good ore.

SOUTH BULWER.—In the winze on the 350 level the ledge is four ft.

BOOKER CON.—The plunger pump on the 480 level is now in place, and this insures perfect freedom from water at the 480 level. Work in the crosscut, 400 level, is rapidly advancing; in 95 ft, with prospects of soon cutting the ledge.

ORO.—The west crosscut is in 102 ft. The material passed through is tough porphyry, with seams of good quartz, carrying iron sulphurets and gold. The east crosscut is in 109 ft, passing through a succession of clay and quartz seams.

SOUTH NOONDAY.—The double-compartment shaft is down 126 ft. The ground in the bottom is a red, iron-stained porphyry, one of the best indications of rich mineral in the district. On the croppings of the sand bank ledge an incline shaft was sunk 60 ft, and good milling ore was struck.

ORIGINAL SUMMIT.—The shaft is down 100 ft, following the ledge. It is rich in free gold, and with high-grade ore to the bottom.

QUEEN BEE.—The east crosscut on the 400 level is in 96 ft, passing through a strata of quartz, carrying good ore.

SONORA CON.—The west drift on the 100 level is in 66 ft. The rock is of a favorable character. Stringers of quartz and clay coming in.

STANDARD CON.—The north drift, 385 level, is in 620 ft. The ledge is 3½ ft wide, of good milling ore. An upraise is started from this drift, 500 ft north of the main crosscut. The ledge in this raise is 4½ ft wide of good ore. The north drift is in 200 ft, showing a ledge 2½ ft wide of fine ore. An upraise has been started from this drift 254 ft south of the main crosscut. The ledge here is 3 ft wide and looks well. An upraise has been made from the intersection of the main east crosscut and north drift, 30 ft. The ledge here is 4 ft wide, of very rich ore. The north drift, 500 level, is in 15 ft, showing a ledge 4 ft wide of good ore. The east crosscut, 500 level, is in 145 ft, and is now in very favorable formation. The south drift from the west crosscut, 300 level incline, is in 124 ft. The ledge here is 3 ft wide of good ore. A connection was made between the drift on the east ledge, 300 level incline, to ventilate the workings on that ledge. This ledge was cut in the east crosscut, 400 ft north of the incline, from which a drift was run north 200 ft, showing a ledge 2½ ft wide of good milling ore. The company will now extract ore from this drift. The west side shaft is down 48 ft below the 700 level. In the north drift, 385 level, the ledge is 20 ft wide of good milling ore. In the south drift, 500 level, the ledge is about 8 ft wide, and looking well. The West Standard is 6 ft wide of rich ore.

BULWER CON.—Drifts have been started north and south on the Stonewall ledge, which was cut last week in the west crosscut from the bottom of the winze on the Ralston ledge, 480 level. The north drift is in 12 ft, showing a ledge two ft wide, of good ore. The south drift is in 14 ft. The ledge here is 18 inches wide, and looks well. The west crosscut from the south drift, 380 level, is in 220 ft. The west crosscut from the 400 level of the Bodie mine is in 84 ft. The north drift on the Ralston ledge, is in 10 ft. The ledge is three ft wide, of good ore. The south drift is in 13 ft, showing a ledge two and a half ft, of good milling ore.

SUMMIT.—The north drift, 630 level, is in 37 ft. The ledge is three and a half ft wide. The north drift is in 39 ft. The ledge is two ft wide.

TIOGA.—Active work has been going on the past week. The shaft has reached a depth of 735 ft. Samples of ore taken from the bottom show free gold in quantities. The Syndicate drift is being pushed ahead, and is now 644 ft from the shaft; east crosscut from the Ralston winze, on the 620 level, is now in favorable vein matter; the upraise from the 520 to the 320 levels, on the vein No. 3, is up 57 ft, and in fair milling ore.

MARYLAND CON.—During the past week the main shaft has been sunk 24 ft, the whole bottom in vein matter, carrying seams of rich quartz and clay. The stopes on the 253 level are yielding good milling ore. The ore continues good in the drift on this level. It is expected that the 500 level will be reached by the last of the month, at which point a station will be opened and crosscuts for the company's three ledges started. Rapid progress is being made, and praiseworthy energy is displayed in advancing the work. The machinery works smoothly. Everything around the mine is in good order, and indicates a practical man at the head.

MCCLINTON.—On the 500 level the west crosscut has reached a distance of 245 ft. The character of the ground is porphyry, with stringers and bunches of quartz, and is evidently near the Jayhawk ledge. On the 675 level the north drift has reached a distance of 675 ft, and the ledge is looking well. The water is handled very easily. Everything in and about the mine is working well.

NEVADA.

PLANET GRAVEL.—*Transcript*, Jan. 15: A test washing of 15 carloads of gravel produced a little over $10 of very fine gold. No quicksilver was used, and consequently more or less of the gold escaped. The gravel coming out improves each day.

PROSPECT.—A tunnel run 300 ft. Ledge 16 inches wide with good ore.

PROVIDENCE.—The 1,500 ft of tunnel leading from the 600 level of the old incline has been connected with the new shaft near the center of the claim. The ore bodies are ready for stoping clear to the 1000 level, and have never been broken into only to obtain samples for testing their value.

MERRIFIELD.—*Herald*, Jan. 17: The last clean-up was the most remunerative they have had since the mine first started. The outlook is most prosperous.

MILTON.—Grass Valley *Union*, Jan. 21: The ditches of the Milton company, above the snow line, are choked with ice and snow, as also the ditches of other companies, and an unobstructed flow of water is not expected for some time yet, or until a warm rain shall help to melt the snow.

MARYLAND.—Surveys are now being made on the Maryland mine with a view to the proper location of a shaft and the erection of hoisting works. The Maryland has long been regarded as a property that would make a valuable mine when the necessary development was made. Hoisting and pumping works of strong capacity will be put up to work the mine at least 1,000 ft, while the tunnel will be utilized to drain off the surface water. There is probably no quartz mining property in the State more inviting as a field for exploitation than the Maryland, as its geological features go to show that a strong contact vein runs into, and probably through the whole length of the location, which is 2,000 ft, and is part of the wonderful lode, which on that portion embraced by the Eureka and Idaho mines has yielded over $10,000,000.

MINING ITEMS.—*Herald*, Jan. 20: The sulphuret works of the Murchie mine, commenced operations last Saturday. The mill of the Providence mine has been idle since last Saturday, on account of a break in the Rough and Ready ditch. It started up again yesterday afternoon. A new pump was put into the Merrifield mine last Saturday. The old pumps would not handle the amount of water requisite from the two lower levels.

NEW DISCOVERY.—*Transcript*, Jan. 21: Sharp & Co., who have for some time past been prospecting below the V Flume, near Canada hill, at last have the satisfaction of "striking it rich." The main tunnel was run into the hill a long distance without showing anything more than stringers. A couple of drifts were made with like result. Finally the tunnel was pushed ahead, and after being extended 40 or 50 ft, developed a three-foot ledge that shows very rich in galena and sulphurets. The owners naturally feel much encouraged, and outsiders who claim to be posted say they have every indication of a first-class mine. It is said that if the present prospects hold out, a mill will be erected in the spring.

SAN BERNARDINO.

IVANPAH CON.—A letter from the Superintendent of the Ivanpah Con. mine, dated January 12th, contained the following: "I have much pleasure in reporting that we have to-day struck ore of a very good grade in the shaft of the lower tunnel. We still continue to have ore in the west drift from the Cook shaft." Another letter from the Superintendent, dated January 15th, says: "Since last writing you the shaft in the lower tunnel is showing an increased body of ore and richer in character. The lower west drift from the Cook shaft is still in ore." The last shipment of ore to San Francisco assayed $1,614.86 per ton.

SIERRA.

GRAVEL MINE.—*Mountain Messenger*, Jan. 17: The gravel mining company called the "One Thousand and One," located above Sierra City on Chips hill, are cutting down their tunnel four ft, and retimbering is in progress. The tunnel is in 500 ft. We saw some coarse gold from this claim.

BLUE GRAVEL.—They have sunk a shaft 42 ft into blue gravel, and are now running a tunnel to tap the same. Expect to find pay on bedrock. Tunnel is in 140 ft and channel about 70 ft ahead.

NORTH STAR.—The company, of Cornishmen, have a tunnel in about 300 ft. Prospects good for pay, as they are undoubtedly nearing a rich channel.

LAST CHANCE.—They are running a bedrock tunnel for the extension of the 1001 channel.

LOST CHANNEL.—This mine is running a tunnel under Thompson's ranch, which is in 250 ft.

SAVAGE.—The tunnel is in 500 ft and gravel 300 ft ahead.

MILTON CREEK.—Chinamen have taken out, within the past three months, 240 ounces of coarse gold.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Gold Hill *News*, Jan. 21: On the nine ft of milling ore passed through after the porphyry horse was penetrated, a drift has been started north and is opening up a fine formation of rich ore. On the 2300 level stopes are being opened south from those on the 2200 level of the Sierra Nevada incline. The ore in this part of the mine extends nearly to the Union shaft, and is of fine quality. The work of enlarging and retimbering the drift south from the Sierra Nevada incline on this level has been completed and a crosscut started east which shows signs of approaching the ore body encountered east on the 2400 level. The south drift on this level was last evening within 11 ft of the line of the joint Mexican winze from the 2000 level. When it reaches a point under this winze, connection will be made by a raise of 10 or 12 ft.

UNION SHAFT.—The work of placing the large pumping engine in position is being urged forward as rapidly as the precise nature of such operations will admit. The large cylinders of the engine are both in place, and to-day the dumps for the skips are being removed and the three-decker cages attached. In the shaft the work of preparing for and placing the pumping apparatus progresses well.

BELCHER.—The east drift on the 3000 level has been pushed up to the casing of the ore vein, and there left for the present for fear that water might be encountered by penetrating that casing, and the mine is now handling all the water it conveniently can. The south drift on this level is being driven ahead with all energy, in order to reach a point under the crosscut on the 2700 level, so as to work east and test the vein under the ore streak encountered above.

YELLOW JACKET.—The shaft has attained a depth of 2,850 ft and reached a mixture of quartz, porphyry and dyke. A station set has been placed at the 2866 level corresponding with the 2760 of the Belcher and the 2700 of the Crown Point and Kentuck, at which point connections with these mines are to be made. The north drift on the 2700 level is reaching out toward the Confidence and Con. Imperial, with which mines connection is also to be made.

CON. VIRGINIA.—Preparations are being made for running a drift south on the 2350 level from the C & C shaft to connect with the joint Best & Belcher winze to be continued on down from the 2150 level. A crosscut east from the foot of this winze and on the 2150 level has been started. On the 1750 and 1550 levels the stopes continue their accustomed yields.

OPHIR.—The joint Mexican crosscut west on the 2300 level continues in soft vein porphyry, which requires timbering; total length, 307 ft. Drifts are being run both north and south on the Hardy vein on the 2200 level. The drift south continues in low-grade ore, but it is known that below the level above there is good ore further on. The north drift is in ore of a good milling quality and looks well.

CALIFORNIA.—The northwest drift on the 1506 level is being reopened and retimbered, and from it a crosscut will be run to explore the ground lying beyond the old stopes.

GOULD & CURRY.—By the latter part of this week or the fore part of next, the joint Best & Belcher east drift on the 1700 level will reach the perpendicular of the G. & C. and B. & B. shaft, and as soon thereafter as preparations can be made a diamond drill will be sent up to tap the water there encountered.

LADY BRYAN.—The latest developments have been made by running a crosscut east from a point in the incline 90 ft below the 750 level. This crosscut this morning had the top for five ft from the face, and the face in very fair rock.

LADY WASHINGTON.—A crosscut west has been started on the 1550 level, 500 ft south of the north line. This crosscut will pass under the point in the vein from which the winze was sunk from the 800 level and found some good ore, and will prospect the vein at the depth of 750 ft.

MEXICAN.—The north drift on the 2300 level continues in a heavy vein formation, in which stringers of quartz giving low assays are found. The joint Union crosscut west, 2000 level, is in vein matter, the face 480 ft from the main north lateral drift.

SIERRA NEVADA.—The drift east on the 2300 level, and running from the station of the incline, has passed through 20 ft of ore, giving fair assays, and further work in that direction stopped. The west drift on this level is in an excellent vein formation, carrying stringers of quartz giving low assays. The north drift on the 2200 level from the east shaft continues in fine-looking vein matter, its face 365 ft from the starting point.

KENTUCK.—The drift north from Crown Point on the 2700 level has reached the south line of the mine, and the work of extending it to the Yellow Jacket line has been commenced, preparatory to crosscutting and exploring the vein on this level.

SUTRO TUNNEL.—The north header of the tunnel is making unprecedented progress through Best & Belcher ground, penetrating dry rock which needs no timbering. The south header is in Bullion ground and is also making excellent progress.

CHOLLAR.—The west drift, 2400 level, is nearing the point from which the Potosi branch is to be started.

BEST & BELCHER.—A crosscut joint with Con. Virginia has been started east on the 2150 level, from which a winze is to be sunk to the 2250 level.

CROWN POINT.—The north drift on the 2700 level has reached the Kentuck line and been taken up by that mine.

UTAH.—The south drift, 1750 level, is in 45 ft and cutting a vein formation of porphyry and clay, carrying stringers of quartz. The east crosscut on this level is in 25 ft in vein matter also. The incline is now 135 ft on the slope below the 1750 level.

OVERMAN.—The east crosscut, 1906 level, is penetrating a very fine vein formation of quartz and porphyry, yielding fair assays. This formation was encountered about 40 ft from the lateral drift and continues over 90 ft.

CALEDONIA.—The south drift, 1900 level, is making rapid progress through soft vein porphyry carrying seams of quartz; total length, 465 ft.

BELMONT DISTRICT.

ALEXANDER.—Cor. Belmont *Courier*, Jan. 17: The bullion product of the Alexander mine for December was $37,530.07. So far in January we have shipped only $7,918.48, but our mill has been shut down part of the time to enable us to put in improvements and additions which we expect will more than double its capacity before the expiration of this month.

BRISTOL DISTRICT.

HILLSIDE.—Pioche *Record*, Jan. 18: A large body of heavy carbonate ore has been cut on the east and west levels. The furnace is reducing 50 tons of ore per day. The cupel furnaces are refining a large quantity of bullion.

EUREKA DISTRICT.

THE K. K.—Eureka *Sentinel*, Jan. 15: All the levels in the K. K. are now producing ore of a good quality. Last month the sale of ores was about $10,000, and it is expected that this amount will be largely increased the present month.

BLOSSOM.—The mine was jumped by parties acting in the interest of the company owning the Home Ticket, which the Blossom adjoins. The Home Ticket assert that it is a part of their claim. Mr. McLaughlin is the proprietor of the Blossom, and has not yet decided what steps he will take in the matter.

CONNOLLY.—Mr. M. P. Murphy, who has leased the lower workings of the Connolly mine, has already made developments that promise to lead to something permanent. He has struck a chamber containing low-grade ore on the lower level, and also a good-sized cave, the sides of which are covered with ore of a good quality.

TRINITY DISTRICT.

NUMA.—*Silver State*, Jan. 15: This mine has produced large quantities of very rich ore. For 15 years it has been the touchstone that other mines have been discovered by, and is now probably the richest mine known in the district. N. Duperu, of San Francisco, patented the mine some 10 years ago, and last year it was reopened. Assays of the ore run from $100 to $3,600 per ton of 2,000 pounds, and the best is at the bottom.

THE ore-producing belt leads from Trinity to Arabia, where the famous Montezuma, Hurricane and other mines have done so much to swell the wealth of the world. Gen. Buckner has lately taken steps to patent the Montezuma, and the idle furnaces of the Oreana works will undoubtedly warm toward their old Arabian friends soon. Most of the developed mines could be purchased cheaply, and easily opened by capitalists.

WINNEMUCCA DISTRICT.

RYE PATCH MILL.—*Silver State*, Jan. 19: Angus Morrison and J. L. O'Donnel have purchased a three-fourth interest in the Rye Patch mill and all the tailings which have accumulated at the mill since it was built. They are now repairing the mill, and will put it in first-class order for the purpose of working the tailings and any ores that may be sent to the mill to be reduced.

OHIO.—Frank Snapp informs us that work was suspended on the Ohio mine, at Rebel creek, about a month ago, in consequence of the drifting snow which filled the cut almost every night. Last week work was again resumed on the mine, and five men are now employed drifting and taking out ore. The ledge looks well and the owners will shortly ship another carload of ore.

ARIZONA.

STONEWALL LODE.—*Silver Belt*, Jan. 10: At the Brilliant, Bates and Amador work has been pushed to the ore vein, but not deep enough to show much ore. At the Virginia a tunnel in progress has reached 60 ft.

STONEWALL JACKSON.—They are turning out large quantities of very rich ore. On the the porch of the office are three boulders weighing from 300 to 600 pounds each, bristling with native silver; while tons of nearly the same character of ore lie on the dumps awaiting to be milled. In the office were three silver bricks weighing 420 pounds, worth $6,500. The difficulty under which the company labor is a want of sufficient water for milling purposes, but that can and will be obviated.

ANTLER.—On the dump there is quite an amount of rich ore. Large boulders coated and seamed with native silver, from one-sixtecnth to one-eighth of an inch in thickness, are extracted. The ore taken from against talc formation is chlorate of silver, of a high character. Water has prevented the further sinking of the shaft, but they are running a drift to the northward.

CONTINENTAL.—Work is progressing with very favorable prospects.

FLORIDA.—The shaft is now in about 55 ft, and they expect to strike ore at 75 or 80 ft. The ledge is very wide and spreads as it goes down, having indications of turning out rich in both quantity and quality.

MISSISSIPPI.—But little work has been done yet.

CHROMO.—The tunnel is in 448 ft, passing through small and large veins of ore. On the hill, lying loose, are tons of very rich ore, which can be taken out at a very trifling cost. On the northern side of the mountain an incline has been sunk 50 ft, following a vein of high-grade ore, which assays $526.60 per ton.

CENTENNIAL.—Has wide veins of rich ore.

SUNSET.—Tombstone *Star*, Jan. 15: In the old shaft the vein is from 11 to 13 ft of solid mineral; grade of ore, about $200; vein dips south and strikes nearly east. The new shaft is turning out rich ore; the vein is large; two-thirds of its ore is gray carbonates and chlorides, very rich, and will run to $600; it contains much horn silver.

PROMPTER.—Has a body of ore in a 22-ft shaft 14 ft wide that will grade to $100. They are running a tunnel 220 ft to strike the 60-ft shaft.

MOUNTAIN TOP.—The tunnel shows the same volume and grade of ore as the Prompter.

RATTLESNAKE.—The shaft is 75 ft, all in ore, with but little waste; ore grades $100, while samples run $300 to $400. It is bonded for $75,000.

NAUMKEG.—Has a rich vein of ore in the shaft.

SIDNEY.—Has a 40-ft shaft in a vein of rich ore of same grade as the Naumkeg.

PRONUCER.—Has one shaft 35 ft and one 22 ft, in good ore all the way.

MOUNTAIN VIEW.—The surface is covered with ore rich in horn and chloride silver. Assays run from $100 to $3,500; by picking specimens, higher results could be obtained.

HAPPY BOY.—*Miner*, Jan. 16: The ore is very rich and

CONTINUED ON PAGE 60.

Influence of Cut-offs on Engines.

The following report of M. Keller, on a memoir presented by M. Hallauer on "Steam Engines," has been translated for us from the *Bulletin de la Societe Industrielle de Mulhouse*, by S. H. Wheeler, of this city:

The work of M. Hallauer, of which I have the honor to present you a summary, is, as its title indicates, a study on the economical influence of the degree of cut-off in various types of steam engines. It tends also to support, on very numerous analyses, the conclusion of the last memoir of the author, that is to say, the equality, in point of working expense, of Woolf engines and single cylinder engines, the advantage being rather on the side of the latter.

It is divided into three parts: The first comprising the researches relative to double cylinder engines; the second, those concerning single cylinder engines; finally, the third, summing up and comparing the results obtained.

We will follow M. Hallauer successively in the study which employs us, and we will take the order adopted by him; that is to say, that after having studied the double cylinder engines, we will examine those with a single cylinder, summarizing for each type, and drawing conclusions then on the whole business.

First Part—Double Cylinder Engines, Called Woolf Engines.

M. Hallauer cites at first all that has been said on the advantage of engines of this system, and after discussion, comes to the conclusion that the only prime consideration truly eerious and incontrovertible, which militates in its favor, is this: That the difference of the stresses from the commencement to the end of the stroke is not so great as in the other types, and that, in consequence of this better distribution, the working of the engine is much more easy. As to the useful effect of a two-cylinder engine, the brake trials executed under the auspices of your committee on mechanics, have shown that the Woolf engines ahsorhed more power for themselves than the eingle cylinder engines, which was otherwise easily foreseen.

Passing then to the examination of the influence of a cut-off in the small cylinder, M. Hallauer commences by examining the results obtained:

1st. In a series of trials executed by bimself in 1877, on a vertical, beam, Woolf engine, situated at Munster, and coming from the workshops of the Societe Alsacienne de Constructions Mecaniques.

2d. In the trials made in 1876, under the auspices of your committee on mechanics, on a horizontal Woolf engine from the same builders, report of the triale having appeared in the *Bulletin* of July–August, 1877.

3d. In those made in February, 1877, by the Association Alsacienne des Proprietaries d'Appariels a'Vapeur, on an engine at Malmerspach, furnished by the same builders, but fitted with a variable cut-off in the small cylinder, actuated by the governor and put on by the Societe des Ateliers de Constructions Mecaniques de Bitschwiller-Thann.

4th. In the trials made at Saint-Remy by M. Queru, and at Rouen hy the Association Normande des Proprietaries d'Appariels a' Vapeur, on two vertical, beam, Woolf engines from the workshops of Messrs. Thomas & Powel, of Rouen.

Having eliminated the trials in which the verification was not sufficiently exact, M. Hallauer determined the consumption of dry saturated steam per bour, per absolute horse power, per indicated horse power, and per effective horse power, per hour, basing hie calculations on the sum of the calories of heat supplied to the cylinder by the steam and water leaving the boiler; in other terms, hy substituting for the entrained water the quantity of steam which the same number of calories of heat would have furnished to the cylinder as this water has taken there, and taking account also of the calories left in the steam jacket by the steam which is condensed there. He passes then to the analysis of each trial, and determines the quantity of steam and suspended water at the end of the admissiou and at the end of the stroke, the variations of the internal heat, and, finally, the cooling effect Rc of the condenser. This cooling effect is verified by two different methods already explained several times hy M. Hallauer in your *Bulletins*.

I ought to pause here a moment to say a few words on the verification of the trials.

M. Hallauer'e very elegant method of investigation has already heen given in his last work; hut I helieve that it is not useless to repeat it here, in order the better to appreciate its importance.

When it is desired to take account of the quantity of steam expended during a given time by a steam engine, the quantity of water fed to the hoiler is measured. This quantity of water, increased or diminished by a weight easily calculated, according as the water level in the boiler is higher or lower after the trial than hefore, gives the quantity of steam used. A method given hy M. G. A. Hirn, and puhlished several times in your *Bulletin*, suffices to determine the proportion of water entrained in the eteam. This constitutes the direct determination, which is verified in the followiug manner:

Knowing the weight of water and steam supplied from the boiler; also the steam pressure in it, it is easy to determine the number of calories supplied to the engine per stroke of piston. This number of calories diminished hy the external radiation, and by the heat ahsorbed in the work, ought to be equal to the number of calories ahsorbed by the water of condeusation, which is obtained in gauging the water leaving the condenser and measnring its final and initial temperature. The method of performing this has been several times described. The difference hetween the number of calories supplied to the engine diminished by that of the calories absorbed in the work and the external radiation, and that of the calories found in the condenser, divided hy the total number of calories, will give the percentage of error that will have been made.

One word, also, *apropos* of the work in absolute horse power, which has not always been easily understood.

The excellent works of M. Hirn have shown the enormous influence of the internal surface upon the manner in which tbe steam behaves inside the cylinder.

When two engines of different types or different dimensions are compared, or otherwise the work furnished by the same engine under conditions of varying work, it is the influence of the internal surface, which must be determined in order to make calculation, for each trial, of the manner in which the steam is utilized.

Now, whatever may be the construction of the condenser, this influence of the internal surface varies hut little, while the vacuum, and consequently the indicated work, may vary within wide limits. The variable vacuum, entering into the calculation if the engines are compared according to their iudicated power, will tend to falsify the results. It is, therefore, compulsory to suppose that the engines which are being compared are provided with ideal condeusers, furnishing a perfect vacuum behind the niston, and to compare the engines with reference to the work furnished with this perfect vacuum. It is this work which constitutes the absolute work of the engine, and it is the consumption for this absolute work which makes it possible to compare among themselves different engines or those operating under conditions of varying work.

It is well understood besides tbat, from a practical and industrial point of vicw, the better the condenser the better will also be the results. This is an affair of the constructor, and has but little influence on the manner in which the steam hehaves in the interior of the cylinder. The absolute work is then the term of comparison, to employ from a tbeoretical point of view, in comparing between themselves engines of different types, or working under different conditions; but the effective work will always be the term of comparison from an industrial point of view.

This stated, I summarize in the following table the results of the verification and analyses of M. Hallauer, and I arrive with him to the following deductions. (See table I.)

The trials made on the Munster engine, for which thè variation of the work is obtained by means of a throttling by the regulating valve, give, as the difference of consumption per hour per absolute horse power, for the extremes of work 3%, which represents the influence of the throttling.

In passing to the coneumption per hour per effective horse power, the economy is much more considerahle and iucreases to 20%, which arises from the increasing influence of the counter-pressure, as tbe work furnished diminishes, and of the co-efficient of friction, which increases under the same circumstances.

M. Hallauer was led to conclude in his previous work that the most simple method of regulating consisted in a cut-off variable hy hand and a governor operating on a valve, the regulation by hand to he employed for considerable variations, the valve serving to maintain the regular epeed despite the small perturhations in the quantity of work required at each instant.

The author of the work explains also, hy simple considerations hased always on the influence of the cylinder walls, different apparent anomalies, which seem to result from the trials. I will not enter into those details which will necessitate giving again thc whole work; all prove that the practical theory indicated hy M. Hiru, and which M. Hallauer applies here, suffices to explain all the phenomena which take place in the interior of the cylinders. After having studied the condensations and the evaporations in the interior of thc small and the large cylinders, M. Hallauer comes to the following important conclusions, which I collect under a little different form from that adopted by him:

1st. Haviug given a boiler working at 5k 5 of pressure (78.22 pounds per square inch), for example, and a Woolf engine capahle of furnishing at this pressure a maximum force of A horse power, there is a possibility of obtaining, industrially, at least 10% of economy in cutting off iu the small cylinder in place of throttling the steam, when on account of circumstances the engine ought to furnish only the half of the work of A horse power. The economy will diminish as the work approaches to A.

2d. The engine workiug in the neighborhood of its maximum power, its power can be varied 10% by the wiredrawing produced by the valve without any noticeable change in tbe economical regime.

The importance of these conclusions is seen at once. In point of fact, there are few Woolf engines working at their maximum power. Besides some huilders of our vicinity when they furnish an engine, rate it at least one-half less power than it really is.

Thus an engine sold for 100-horse power can ordinarily furnish 200 without heing at its maximum; this style of working presents some practical advantages, hut it is nevertheless true that when this engine makes only 100-horse power, regulated by throttling, it consumes 10% more than it would have consumed if this work of 100-horse powcr had been ohtained by admitting at full pressure, and cutting off in the small cylinder.

I am not, however, altogether of the same opinion as M. Hallauer when he prefers a cut-off variable hy hand; I believe that from a practical point of view a cut-off variable hy the governor works better, for it insures against any neglect of the engineer, who can not nearly so well give the cut-off called for at the moment as when it is left to its own free will; besides we have almost always observed that the cut-offs variable by the governor give a steadier speed than tbose regulated by the valve.

Second Part—Influence of the Cut-off in Single Cylinder Engines.

M. Hallauer proceeds for these engines as he has done for those of two cylinders, he first verifies the trials on which he depends, then he analyzes them.

The documents serving in this examination give the following experiences:

1st. Those executed under the auspices of your mechanical committee in April and May, 1878, on a Corliss engine constructed by Messrs. Berger, Andre & Co., of Thann.

2d. Those enterprises in 1873 and 1875 by Messrs. Hallauer, Groseteste and Dwelshauvers-Dery, under the direction of M. G. & A. Hirn, and executed on au experimental engine, unjacketed and working with superheated steam, or with saturated steam. We group the results of the verifications and of the analyses in table II.

Examinations of these results shows:

1st. That for the Corliss engine with steam jacket there is a theoretical economy (per absolute horse power) of 1% 6 in passing from ¼ to 1-11 cut-off, but that industrially this economy disappears and changes its sign, and there is a practical advantage (per effective horse power) of 4½% by working with a cut-off of ⅛ in place of a cut-off of 1-11.

2d. Tbat for the unjacketed engine without super-heat the economy furnished by the cut-off is much more considerable, since on the Hirn engine working with saturated steam there is a theoretical economy of 7.4% at 1-7 instead of ¼ cut-off, and that industrially this economy still remains at 4%.

3d. In taking account of the difference of the super-heat of the trials I. and II. (196° and 231°—384° F. and 447° F.) it ie noticed that this influence of the cut-off in the unjacketed engine remains with super-heated steam what it was with saturated steam.

Trial III. with super-heat proves still more the great economy of the cut-off in these circumstances, when certain limits are passed, eince between one-half admission and one-seventh there is 15% of economy, which would have been still more considerable if during trial I. the work had been done with the same super-heat as during trial III.

4th. In tbe Hirn engine, the trials with saturated steam give at the end of the stroke the same weights of water, .0940 and .0927, in the cylinder, and the cooling effects by the condenser are also the same, 37.53c and 37.02c; therefore, unjacketed, the same weights of water give the same values of Rc. For the Corliss engine, on the contrary, with different weights of water, .0298 and .0398 at the end of the stroke, give the same valnes for the cooling by the condenser, 11.21c and 11.15c, a result which comes from the steam jacket. For the trials II. and III. with euper-heat, the weights of water at the end of the stroke are .0367 and .0373, and the cooling by the condenser 16.61c and 20.34c, a difference which must be attributed to the super-heat, for in the same conditions the saturated steam gives equal cooling effects by the condenser for the weights of water evaporated at the end of the stroke. Which shows that the super-heat works differently from the steam jacket.

Analyzing the variation of internal heat in the various trials which concern us, and the values of the cooling effect by the condenser which result from differences of cut-off, according as we work with or without jacket, with or without super-heat, M. Hallauer is also convinced of the different mode of action of the jacket and super-heat.

The jacket works more actively than super-heat and in the same sense, during the period of expansion, but becomes disadvantageous during the condensation; for then, supplying heat to the water which covers the interior walls of the cylinder, it augments the cooling effect of the condenser, which is not produced by super-heat, and which renders the latter more econnomical in the majority of cases. Examining, then, the theoretical economy, in comparing the consumptions per hour per absolute horse power and the industrial economy, in comparing them per hour per effective horse power, the author comes to the conclusion with M. Zeuner that high grades of expansion are econonomical from a theoretical point of view, and with M. Hirn, that it is inversely from an industrial point of view.

Thus, the conclusions of these two savants which seem to contradict, are found to agree in taking into account the different considerations which have guided each of them; the one, M. Zeuner, having made the general study of steam engines, in arguing from unrealizable considerations, (impermeahility to heat of the cylinder walls), the other, M. Hirn, on the contrary, having studied them from an industrial point of view, in taking account of the permeability of the cylinder walls to heat and of the work ahsorbed hy friction.

Third part. *Comparison of the different types of engines studied.* The conclusion of M. Hallauer's work comprehends the comparison of two cylinder engines and single cylinder engines, in reckoning always from the analyeis of the trials which have served for the two first parts of the work. He reiterates at the heginning, what he understands hy absolute, indicated and effective horse power.

The absolute power is the work whicb the engine would have given with an ideal conden-

Single Cylinder Engines.—Table II.

	Corliss—Steam Jacket.			Hirn—Without Steam Jacket.				
	Saturated Steam.			Saturated Steam.		Superheated Steam.		
	I.	II.	III.	1.	II.	I. 196°	II. 231°	III. 273°
Ratio of expansion	1-11	1-8	1-6	1-7	1-4	1-7	1-4	1-2
Power indicated on the piston	105	137	153	107	146	113	154	125
Percentage of error, discvrd by the verification	3%1	2%3	2%4	0.1%	0.7%	0.6%	0.8%	0.6%
Consumption of dry saturated steam per hour per absolute horse power (kilos.)	7.188	7.236	7.307	7.822	8.449	6.655	7.000	7.874
Consumption of dry saturated steam per hour per indicated horse power	7.983	7.939	7.955	8.837	9.307	7.370	7.633	8.655
Consumption of dry saturated steam per hour per effective horse power	9.071	8.724	8.046	9.929	10.341	8.188	8.207	9.511
Proportion of steam condensed in the jacket	6.5%	6%	5.3%	.....	.....	.....	.....	.....
Proportion of water contained in the steam at the end of the admission	38.3%	31.7%	25.3%	37%	31%	24.6%	6.5%	Suprhtd
Proportion of water contained in the steam at the end of the stroke	21.7%	19.2%	18.5%	35.2%	25.2%	21.4%	12%	13.2%
Values of Rc	11.21	11.14	11.15	37.01	37.53	18.80	16.61	20.34
Rc in times % of the calories supplied to the engine	12.3%	9.8%	8%	21.6%	15.4%	12.5%	7.8%	10.5%

Centigrade Measures.

Table I.

Two Cylinder Engines.—Centigrade Measures.

	Munster Engine.			Malmerspach Engine.				Vertical Woolf Engine.		Thomas & Powel Engine.	
	Trial I.	Trial II.	Trial III.	Trial B.	Trial C.	Trial D.	Trial E.	Trial F.	Light Work.	Heavy Work.	Trial Anée.	Trial Queru.
Ratio of expansion	1-9	1-7	1-7	1-6	1-13	1-13	1-28	1-25	1-0	1-0	1-22	1-10
Indicated horse power	347	267	185	201.6	215	212.92	143.11	149.53	130	181	137	9.702
Percentage of error discvrd by the verification	1.35%	0.29%	1.5%	2.8%	4.9%	2.9%	3.2%	2.5%	1.13%	7.00%	9%	3.5%
Consumption of dry-saturated steam per hour, per absolute horse power (kilos.)	7.112	6.045	7.334	7.402	6.678	6.983	6.731	6.821	7.290	7.333	.....	7.591
Consumption of dry-saturated steam per hour, per indicated horse power	8.614	8.750	9.730	8.847	8.140	8.210	8.273	8.300	9.120	8.878	.....	6.840
Consumption of dry-saturated steam per hour, per effective horse power	9.304	10.357	12.411	10.301	9.465	9.517	10.011	9.938	10.563	9.975	.....	.....
Proportion of steam condensed in the jacket	8.6%	0%	10.4%	5.1%	7.7%	.....	8.5%	.....	10%	10.8%	.....	.....
Proportion of water contained in the steam at the end of the admission	16.17%	14.21%	21.17%	12.8%	23.7%	.....	40%	.....	11.20%	10.8%	.....	.....
Proportion of the stroke of the small piston	19.1%	.....	7.39%	11.5%	13.1%	14.9%	19.1%	17.5%	5.34%	4.5%	.....	.....
Proportion of water contained in the steam at the end of the stroke in the large piston	6.6%	5.30%	.....	.....	17.0%	.....	17.6%	.....	.....	.....	.....	.....
Negative work of the exhaust relative to the absolute work	17.43%	20.52%	24.10%	16.4%	15.0%	.....	18.6%	.....	20.00%	17.3%	.....	.....
Value of Rc	21.80%	6.65%	13.49%	8.44%	31.44%	.....	19.31%	.....	1.65%	1.10%	.....	.....
Value (in %) of the calories supplied to the engine	3.38%	1.32%	3.65%	2.1%	8.3%	.....	7.8%	.....	1.10%	0.6%	.....	9.0%

This trial has been neglected on account of not verifying itself.

*Not having the original minutes of the curves, the analysis has not been completed.

ser making a perfect vacuum behind the piston. (It is the theoretical work.)

The indicated work is that furnished directly by the steam on the pistons; it takes account of the influence of the back pressure. (It is the power calculated from the diagram drawn by the indicator.)

The effective power is finally the work industrially available; it takes account of the influence of the back pressure and the friction of the various organs of the engine itself.

This premised, there are two trials verified, the one made on a Corliss engine, ¼ cut-off; the other on an engine at Malmerspach, 1-13 cut-off, the figures of which are as nearly alike as possible.

	Corliss Engine.	Woolf Engine.
Water contained at the end of admission	25%	23.7%
Water contained at the end of expansion	18.5 "	17.9 "
Difference of initial and final heat	1.83 calories	1.21 calories
Cooling effect of the cylinder	8.3 "	8. "

The comparison of these two trials lead to some very interesting conclusions.

A phenomenon to be immediately noticed for the Woolf engine serves to destroy that false idea held till now, that in the two cylinder engines the refrigerating influence of the condenser is reduced one-half.

Indeed, in the small cylinder, the half-stroke cut-off gives rise to an evaporation of 10% 6 of the weight of water contained at the end of the admission, and the internal heat increased much more rapidly than in the Corliss engine. Then, the mixture of steam and water passes to the large cylinder with 13.1% of water, and in place of the evaporation continuing in this cylinder, there is, on the contrary, condensation, despite the influence of the jacket, since at the end of the stroke we find 4.8% more water separated than at the end of the stroke of the small piston. This points to a great condensation at the moment of the entrance of the steam into the large cylinder, a condensation which is so powerful that, in spite of the effects of the jacket, all the steam that is condensed in the large cylinder in excess of that which was already in the small, cannot be evaporated.

In the Corliss engine on the contrary, evaporation is continued to the end of the expansion. It is easily seen, therefore, that the influence of the large cylinder, in case of an expansion commenced in the small one, does not tend always to reduce the losses of heat, but that on the contrary, it can sometimes augment them, which contradicts that which was until now admitted.

The consumptions of dry saturated steam per hour per absolute horse power, give the theoretical economy realized by either engine. If we take the consumption of the Corliss at what it would have been with 1-13th cut-off, which is that of the Woolf engine for the trials which we are comparing, we find that the theoretical economy is 4% in favor of the Woolf engine; but the influence of the counter pressure, and still more that of the friction, reduces this economy as soon as we pass into the industrial domain, it then changes sign, and we find that the practical economy becomes 8.7% in favor of the Corliss.

Comparing the horizontal Woolf engine with the Corliss, in taking account of the absence of compression in the former, M. Hallauer still found a theoretical economy of 4% for the Woolf engine. But this economy also disappeared in practice, and then again, the Corliss engine became industrially superior by 9%05 to the horizontal Woolf engine; nevertheless in taking account of the construction of this latter, the difference fell to 2%, and then the horizontal Woolf engine consumed only 8.8 kilos of dry saturated steam per hour per effective horse power, which would be the minimum to which we could attain by a careful construction of the condenser and a greater compression. In concluding, M. Hallauer collects in a table II, the consumptions of steam per hour, per absolute, indicated and effective horse power, adding the consumptions of coal per effective horse power per hour, in supposing that a kilogramme of coal evaporates 8 kilos of water.

This table shows that the various double cylinder types studied, consumed from 9k 1 to 9k 5 of steam per hour per effective horse power; the Corliss engine with ¼ cut-off consuming only 8k 6, whilst the Hirn engine with superheated steam has only 8 kilos of consumption with 1-7 cut-off. Recapitulating the work of M. Hallauer, which is one of those laborious and conscientious studies, to which he has for a long time habituated our society, is very remarkable in its conclusions and tends to prove once more the impossibility of stating anything about steam engines with the precision of fact, if one does not support himself on verified trials of existing engines.

We have been obliged in this epitome, to neglect many interesting things and to seek principally to set forth the various conclusions of M. Hallauer; but everybody engaged with steam engines will certainly find in his work exceedingly useful material, which can serve in many circumstances. We ought then, with the utmost good will, to thank M. Hallauer for all these studies which make enormous demands upon time, patience and reflection; all which he has certainly not spared in his last memoir. You know besides, that he is clad in truth, as you have been able to judge by the numerous works which he has already presented to our society; of which this last, gives, in some degree, the most interesting practical conclusions.

Useful Information.

Mending Belts.

It is not always economy to replace a partially worn belt by a new one. So long as there are portions of a worn belt that retain a part of their original soundness, it is useful as a portion of another belt. In no case put a piece of new, unused belting into an old or partially worn one; more than eighteen hundred years ago this fact was recognized and recorded, although the word "bottle" was used instead of belt. The uniform tension of a belt is impaired by uniting new and unused leather with that which has grown supple by use. No belt should have more than one butt joint. The pieces should be put together in scarf joints by means of rivets or lace leather; old belts have usually absorbed so much lubricating oil that belt cement—fish glue—will not "take." In riveting, the heads should be on the wearing or pulling side and the burrs or washers on the other. In sewing a lap the awl should be passed through in a slanting direction and the stitches should present the smallest amount of surface on the pulling side. In making a butt joint the lacing should not be crossed on the pulley side. The ends of the belts should always be cut by a try square to insure perfect straightness. In taking up belts, even narrow belts, it is much better to cut and sew the belt *in situ* than to run it off the pulleys. The proper degree of tension can always be thus secured and the belt not be kept too loose nor shortened too much; besides, there is always an uneven strain, liable to work injury to the belt in running it on. The Billings & Spencer Co., of Hartford, Conn., make a handy clamp for this purpose. It is geared and is rapid in operation, and is made in all widths. Perhaps there are other good ones in the market; a good belt clamp should have a place in every shop and factory. If you cut your own lace leather, the handiest way to make laces is, after straightening one edge of the skin, to guide the knife with the thumb instead of a straight edge, under which the leather will stretch and pull. By holding the thumb rigid any width of lace may be assured and the work is very rapidly performed.—*Ex.*

Grindstones.—What can disable a machine shop more effectually than to destroy the grindstone? Unless the loss were supplied by the modern substitute, the emery grinder, to destroy the grindstone would be to wreck the shop. A thorough study of the subject will develop more requirements than many think, and much ingenuity or skill in designing might be displayed in working out the problem. It should be strong, simple and clean; the trough expanded to catch as much as possible of the drip water and grit; a movable shield securely hinged to keep the water from splashing, and yet permit the stone to be used from either side; rests provided upon which to rest tools and the rod for turning the stone, these rests being arranged to move toward the center as the stone wears smaller. The bearings should be generous in size, proper provisions being made for oiling without washing the grit into the bearings with the oil, and the ends of the bearings being protected by some device which effectually prevents the entrance of the grit. The stone should be secured to the shaft by nuts and washers, and the washers fixed so that they cannot turn with the nuts as they are screwed up or unscrewed. In hanging the stone, great care should be taken to hang it true sidewise, not only for convenience in using, but because a stone that is not true sidewise can never be kept true edgewise.

Chlorate of Potash from the Dead Sea.—Chemical analysis having long ago shown that the waters of the Dead sea in Palestine are rich in chlorate of potash, a company has been formed, and already commenced operations, to extract this salt from its waters. It is stated that in this way chlorate of potash can be obtained 30% cheaper than by the cheapest process thus far known; and as there is an increasing demand for this salt, it is a safe and profitable investment. In order to save fuel, which is scarce in those regions, the works are kept in the most active operation during the dry season, when the water is low and the River Jordan does not dilute them much, the water level varying considerably, and consequently the concentration. This body of water, of course, contains the soluble ingredients from the hights surrounding the whole water-shed, of which the rains have made a lye, and solar evaporation has concentrated in that sea.

Cellular Construction.—A good illustration of the principle and strength of cellular construction may be given as follows: Take a piece of tin, some 12 inches long and 6 inches broad. Lay its ends on two blocks. Thus suspended a few ounces of weight bends it down to the ground. But roll it up in a tight roll and you may suspend very many pounds from it without its yielding a particle. This illustrates the strength of cellular construction. On this plan the *Great Eastern* steamship was built, she having, up to the water-mark, an inner and outer metal shell of three-quarter-inch plate, placed three feet ten inches apart, and between them, at intervals of six feet, run horizontal webs of iron plates, which convert the whole into a series of continuous cells or iron boxes.

Incombustible Wood.

M. M. P. Folbarri claims that he has discovered a method by which wood of any kind can be rendered incombustible. It becomes, as it were, petrified, without any alteration in appearance. When intense heat is applied to wood so prepared it chars the surface slowly and without flame, but does not penetrate to any extent, and leaves the fiber intact, whereby, in case of fire, the firemen would have no occasion to fear that the materials on which they tread would give way beneath them, if this operation had been undergone by the wood composing the staircases, floors, etc. The following chemical compound is said to produce the result: Sulphate of zinc, 55 lbs.; potash, 22 lbs.; alum, 44 lbs.; oxide of manganese, 22 lbs.; sulphuric acid of 60 deg., 22 lbs.; water, 54 lbs. All of the solids are to be poured into an iron boiler containing the water at a temperature of 45 degrees C., or 113 F. As soon as the substances are dissolved, the sulphuric acid is to be poured in little by little, until all the substances are completely saturated. For the preparation of the wood it should be placed in a suitable apparatus, and arranged in various sizes (according to the purposes for which it is intended) on iron gratings, care being taken that there is a space of about half an inch between every two pieces of wood. The chemical compound is then pumped into the apparatus, and as soon as the vacant spaces are filled up, it is boiled for three hours. The wood is then taken out and laid on a wooden grating in the open air, to be rendered solid, after which it is fit for uses of all kinds, as shipbuilding, house-building, railway carriages and trucks, fence-posts, wood paving—in short, for any kind of work where there is any liability to destruction.

Wood and Iron Gearing.—When gearing is run at high speed, or in any way subjected to severe shocks, if one of the wheels of a pair has its teeth made of wood and inserted into its rim, it has been found—first, that the elasticity of the wood relieves the shock on the iron tooth and reduces the liability of breakage; second, that in case of breakage the wooden teeth are more liable to be broken, and in consequence the teeth can be readily renewed without sacrificing the entire wheel; third, the impact of iron teeth upon wooden ones makes less noise than that of iron upon iron.

Good Health.

Marvels of Man.

While the gastric juice has a mild, bland, sweetish taste, it possesses the power of dissolving the hardest food that can be swallowed; it has no influence whatever on the soft and delicate fibers of the living stomach, nor upon the living hand, but, at the moment of death it begins to eat them away with the power of the strongest acids.

There is dust on sea, on land; in the valley, and on the mountain-top; there is dust always and everywhere; the atmosphere is full of it; it penetrates the noisome dungeon, and visits the deepest, darkest caves of the earth; no palace-door can shut it out, no drawer so "secret" as to escape its presence; every breath of wind dashes it upon the open eye, and yet that eye is not blinded, because there is a fountain of the blandest fluid in nature incessantly emptying itself under the eyelid, which spreads it over the surface of the ball at every waking and washes every atom of dust away. But this liquid, so mild, and so well adapted to the eye itself, has some acridity, which, under certain circumstances, becomes so decided as to be scalding to the skin, and would rot away the eyelids were it not that along the edges of them there are little oil manufactories, which spread over their surface a coating as impervious to the liquids necessary for keeping the eye-ball washed clean, as the best varnish is impervious to water.

The breath which leaves the lungs has been so perfectly divested of its life-giving properties, that to re-breathe it, unmixed with other air, the moment it escapes from the mouth, would cause immediate death by suffocation, while if it hovered about us, a more or less destructive influence over health and life would be occasioned; but it is made of a nature so much lighter than the common air, that the instant it escapes the lips and nostrils, it ascends to the higher regions above the breathing-point, there to be rectified, renovated and sent back again, replete with purity and life. How rapidly it ascends, is beautifully exhibited any frosty morning.

But foul and deadly as the expired air is, Nature, wisely economical in all her works and ways, turns it to good account in its outward passage through the organs of voice, and makes of it the whisper of love, the soft words of affection, the tender tones of human sympathy, the sweetest strains of ravishing music, the persuasive eloquence of the finished orator.

If a well-made man be extended on the ground, his arms at right angles with the body, a circle, making the navel its center, will just take in the head, the finger-ends and feet.

The distance from "top to toe" is precisely the same as that between the tips of the fingers when the arms are extended.

The length of the body is just six times that of the foot; while the distance from the edge of the hair on the forehead to the end of the chin, is one tenth the length of the whole stature.

Of the sixty-two primary elements known in nature, only eighteen are found in the human body, and of these, seven are metallic. Iron is found in the blood; phosphorus in the brain; limestone in the bile; lime in the bones, dust and ashes in all.—*Journal of Health.*

How Long We Are to Live.

It is not everyone who asks himself this question, because, strangely enough, it is the belief of many persons that their lives will be exceptionally lengthy. However, life assurance companies are aware of the credulous weakness of those whose lives they assure, and have therefore compiled numerous tables of expectancy of life for their own guidance, which are carefully referred to before a policy is granted. The following is one of these well-authenticated tables, in use among London assurance companies, showing the expectancy of life at various ages. In the first column we have the present ages of persons of average health; and in the second column we are enabled to peep, as it were, behind the scenes of an assurance office, and gather from its table the number of years it will give us to live. This table has been the result of careful calculation, and seldom proves misleading. Of course, sudden and premature deaths, as well as lives unusually extended, occasionally occur; but this is a table of average expectancy of life of an ordinary man or woman:

Age.	More yrs. to live.	Age.	More yrs. to live.
1	30	50	21
10	51	60	14
20	41	70	9
30	34	80	4
40	40		

Our readers will easily gather from the above tabulated statement the number of years to which their lives, according to the law of averages, may reasonably be expected to extend.

Antidotes to Dyspepsia.—Sleep will do a great deal to restore the tone of the stomach where dyspepsia results, as it often does, from overwork. Stout people, who have it from overeating, should work out of doors, accustoming themselves to hearty work by degrees. The prescription given by an old physician to alleviate dyspepsia, is to drink half a cupful of boiled water, just as hot as one can swallow it, half an hour before each meal, and I have known it to give great relief. The hot water stimulates the energies of the stomach and dilutes the acrid juices which it secretes. A wet cloth, cold or hot, as feels best, worn on the stomach will greatly strengthen it. If the food is carefully selected to suit a weak digestion, dyspepsia will cure itself. Strong chicken broth, without a particle of fat, may often be taken when other things irritate. Raw beef, very finely minced, like meal, and set in a covered saucer in a hot oven until it becomes pink, not brown, can be taken by the worst dyspeptics. White of egg beaten to a froth, or a spoonful of whipped cream, often will not offend. Dyspeptics should eat sparingly, a spoonful once in an hour or two, rather than attempt a small meal three times a day. Bits of ice, swallowed whole, and frozen cream often relish. But the cream should be entirely without sugar. A bit of licorice or parched dandelion root, or cherry bark, chewed and kept in the mouth, strengthens the digestion sensibly.—*Toledo Blade.*

Colic.—The "colic" is usually caused, first, by costiveness, a stoppage, and then indigestion, causing fermentation and the production of carbonic gas in the stomach and the large bowels near the stomach, the expansion of which by heat produces this pain. It is almost immediately relieved by a full injection of warm water resulting in an operation from the bowels, of course removing the costiveness. This costiveness usually results either from the overfeeding or too frequent nursing of the babe—once in about three hours is sufficiently often—or from the use of too much fine food by the nursing mother. Therefore to prevent these torturing pains, avoid or remove this costiveness as soon as known, by the injections and, great care in the time of nursing, and in the food and habits of the mother. Should the bowels seem inflamed and tender, it is safe to wet a soft flannel in tepid water and wrap around the bowels, covering with dry flannel, being careful to keep the little one comfortably warm. This tenderness of the bowels may be observed by noticing appearances of pain as the bowels are pressed, or when an operation occurs.

The Hands.—In order to preserve the hands soft and white, they should always be washed in warm water, with fine soap, and carefully dried with a moderately coarse towel, being well rubbed every time to insure a brisk circulation, than which nothing can be more effectual in promoting a transparent and soft surface. If engaged in any accidental pursuit which may hurt the color of the hands, or if they have been exposed to the sun, a little lemon juice will restore their whiteness for the time; and lemon soap is proper to wash them with. Almond paste is of essential service in preserving the delicacy of the hands. The following is a serviceable pomade for rubbing the hands on retiring to rest: Take two ounces of sweet almonds; heat with three drachms of white wax, and three drachms of spermaceti; put up carefully in rose water. Gloves should always be worn on exposure to the atmosphere, and are graceful at all times for a lady in the house, except at meals.

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Assessment Notice—Gila S. M. Co.

The Week.

A large proportion of our space this week is devoted to a very full and exhaustive review of the mining interests for 1879. This review will be found useful for reference, as it gives in a succinct manner the results of operations for the year past, and the prospects of the coming one. We have given most of the space to California interests, as a detailed review of the different States and Territories would exceed the limits of a newspaper article.

The season is not sufficiently advanced for a revival of business to be manifested, still, our leading merchants say that their sales are more extensive than they were equally early last year. The weather has been very favorable for some days past for the farmers.

Our law markers at Sacramento have not manifested any utile ability; it is to be hoped they will improve before the close of the legislature assemblage.

A terrible explosion occurred in the Lycett Colliery, near Newcastle, England. It is stated that from 70 to 90 lives were lost. The explosion is attributed to the ignition of gas. The fire was raging at last accounts, and the bodies which had been brought out were burned past recognition.

TAGS ON CABLES.—Amateur asks us: "How can I fix tags on round wire cable so that they will stay? I am running incline engine. I use rope strands tied around the cable for tags; but they stay on only a few hours, and the ends wear off and cover the rope from one end to the other." You should raise a strand of the cable, and pass a piece of bright sheet metal beneath it; then line it by winding soft iron wire around it, to keep it in place.

THE President has nominated James Russell Lowell, of Massachusetts, to be Minister to England; John W. Foster, of Indiana, Minister to Russia; Lucius Fairchild, of Wisconsin, Minister to Spain; and Eli H. Murray, of Kentucky, Governor of Utah.

DURING the late freeze in Oregon about one million salmon eggs were frozen at the hatchery on the Clackamas. Every effort was made to save them, but without avail. As it is, about one million and a half of young fish have been safely put into the water.

GRANT and Bayard have been nominated in South Carolina for President and Vice-President.

Mines and Mining in 1879.

Bullion Production—Losses and Gains.

Mining industries and interests throughout our gold and silver-producing States and Territories may be said to have been fairly prosperous the past year, notwithstanding the aggregate amount of bullion turned out shows a considerable falling off as compared with that of the preceding year. Adopting the figures of John J. Valentine, General Superintendent of Wells, Fargo & Co's. express, the product of these years was as follows: 1878, $81,154,622; 1879, $75,349,501; making a balance of $5,805,121 in favor of the former. This difference was due mainly to diminished production in the State of Nevada, where it reached a total of $13,184,235, the decrease on the Comstock lode alone having amounted to $12,454,481. The following is Mr. Valentine's statement of the gold, silver and lead turned out last year in the States and Territories west of the Missouri river; the bullion received at San Francisco from British Columbia and the west coast of Mexico included:

California	$18,190,973
Nevada	21,999,714
Oregon	1,037,961
Washington	85,336
Idaho	2,091,300
Montana	3,623,020
Utah	5,468,879
Colorado	14,413,515
New Mexico	622,800
Arizona	1,942,403
Dakota	3,208,987
Mexico (West Coast)	1,633,571
British Columbia	976,742
Total	$75,349,510

The following table from the same source shows the gross yield, segregated:

Year.	Products as per W. P. & Co.'s statements, including amounts British Columbia and West Coast of Mexico.	Products after deducting amounts from British Columbia and West Coast of Mexico.
1870	$54,000,000	$52,150,000
1871	58,284,000	55,784,000
1872	62,236,959	60,351,824
1873	72,258,693	70,139,860
1874	74,401,045	71,765,610
1875	80,889,057	76,705,533
1876	90,875,173	87,219,859
1877	98,421,754	95,811,582
1878	81,154,622	78,276,167
1879	75,349,501	72,688,888
Gold	43 20-100%	$32,539,920
Silver	50 25-100%	38,623,812
Lead	5 55-100%	4,185,769
Total		$75,349,501

The annual products of lead, silver and gold in the States and Territories west of the Missouri river from 1870 to 1879 were as follows:

	Lead.	Silver.	Gold.
1870	$1,080,000	$17,320,000	$33,750,000
1871	2,100,000	19,286,000	34,398,000
1872	2,250,000	19,924,429	38,177,395
1873	3,450,000	27,483,302	39,206,558
1874	3,800,000	29,699,122	38,466,488
1875	5,100,000	31,635,239	39,968,194
1876	5,040,000	39,292,924	42,886,935
1877	5,085,250	45,846,109	44,880,223
1878	3,452,000	37,248,137	37,576,030
1879	4,185,769	37,032,857	31,470,262

The product of British Columbia, Washington Territory, Oregon, California and Dakota is nearly all gold. The countries, in addition to Nevada, that show some falling off, are California, $729,488; Utah, $595,734 and Arizona $345,580. The largest gain made was by Colorado, equal to $8,000,000, chiefly from the recent discoveries at Leadville. The decrease in California is attributable to a considerable curtailment of the silver production in Inyo county, and a lessened yield of the hydraulic mines by reason of an unusual scarcity of water. That Arizona should last year have gone backward instead of forward in the matter of bullion production is something inexplicable, seeing that the railroad has lately been extended almost to her principal mining centers, and also that her ore-reducing facilities have been much increased, and large amounts of capital invested in her mines during the year. It is the case, however, that some of her more prominent mines, such as the Silver King and the Stonewall Jackson, which, with their showing of rich ores, created at one time no little sensation, have not turned out bullion as was expected, having been barely able to keep up the production made by them 12 months ago.

Dividends.

Of course the question of mining dividends is one of great importance in connection with the production, for they represent the profits. Unfortunately, however, no accurate record of dividends is kept. By far the larger number of mines are worked by private companies, and while their bullion product, passing through the express company, shows, in the gross results, the amount of profits is of course a matter for the owners only. We cannot, therefore, tell anything about the dividends except of those companies which publish annual reports, or which are large corporations, the stock of which is sold in the stock boards. The following table, compiled from the *Mining Record*, shows the results accomplished by some Eastern incorporations, most of the dividends having been paid in New York, Boston, Philadelphia and London:

Name.	Location.	Div's.	Amount.
Empire	California	4	$64,000
Green Mountain	California	0	37,500
Pioneer	California	2	8,000
Plumas Eureka	California	1	60,000
Plumas National	California	6	54,000
Sierra Buttes	California	1	40,000
Findley	Georgia	4	8,000
Richmond Consolidated	Nevada	3	337,500
Tombstone	Arizona	1	50,000
Briggs Consolidated	Colorado	1	8,000
Caribou	Colorado	4	40,000
Climax	Colorado	1	20,000
Chrysolite	Colorado	2	400,000
Horn Silver	Utah	1	100,000
Little Pittsburg	Colorado	12	1,250,000
Leadville	Colorado	6	120,000
La Plata	Colorado	3	45,000
Calumet & Hecla	Michigan	4	1,600,000
Central City	Michigan	1	80,000
Osceola	Michigan	1	60,000
Ore Knob	California	2	97,500
Quincy	Michigan	1	40,000
Total			$4,527,30

The *Bulletin*, of this city, compiles the following tables of Pacific Coast dividends from transcripts from books in their office:

Name.	Location.	Div's.	Amount.
Argenta	Nevada	1	$20,000
Belle Isle	Nevada	6	300,000
Bodie Con	California	6	350,000
California	Nevada	5	1,620,000
Con. Virginia	Nevada	5	1,350,000
Con. Amador	California	1	7,500
Excelsior	California	7	147,000
Eureka Con	Nevada	12	$25,000
Father de Smet	Dakota	1	30,000
Great Western Quicksilver	California	1	12,500
Homestake	Dakota	12	360,000
Idaho	California	12	168,950
Independence	Nevada	3	75,000
Indian Queen	Nevada	1	12,000
Martin White	Nevada	3	90,000
North Bloomfield	California	1	90,000
Napa Con. Quicksilver	California	2	20,000
Ophir	Nevada	1	100,800
Ontario	Utah	12	600,000
Standard Con	California	12	600,000
Total			$9,778,750

This table is no doubt correct so far as it goes, but it by no means goes far enough, for the simple reason that this figures are not accessible from all the companies. It will be noticed that only one gravel mine is mentioned, and not a single drift mine, yet dozens of them have paid dividends regularly. Many quartz mines, unknown to stock circles, are also paying dividends monthly. The published tables of dividends, therefore, by no means give an accurate view of the profits of the mines.

Mining in the Northern Section of California.

Grouping the mining counties of California in geographical order, we remark the following among other noteworthy facts transpiring the past year in connection with mining interests and operations in the northern part of the State:

The quartz interests of Lassen county, though still in their infancy, give promise of value in the future. While the veins there are mostly narrow and somewhat "spotty" the ores are easily handled, and, so far as developed, have every appearance of proving permanent. A pocket containing some $8,000 ore, was recently discovered at Hayden Hill. The veins of Gold Run in this county are reported as showing indications of decided merit. Plumas county also makes a pretty fair exhibit of exploratory work done during the year, the people there having apparently awakened to a realization of the fact that many of the old gravel channels, some of which had been deserted in years past, because they did not meet the high hopes of early miners, will still pay if operated with economy and care. Sinking on the big shaft at Jamison has been temporarily suspended at a depth of 200 feet, for the purpose of getting in new machinery, the owners being determined to bottom the blue lead known to exist at that point. Quartz mining also appears to be looking up in this county. The mills of the Plumas National, Green Mountain, Mexican and other companies have been kept steadily at work and give satisfactory results.

In Sierra county every branch of gold mining is successfully and quite largely represented. The Sierra-Buttes quartz mines show as good a record as any in the State, while the Bald Mountain drift claim mines, after an excellent history covering a period of more than 20 years, still continue to pay well. The Niagara and the Bald Mountain drift claims stand in the very front rank of this class, while the hydraulic mines at La Porte and Brandy City yield, as they have done for a number of years, munificently, the latter during the past year having undergone very great improvement. Several other hydraulic and many drift mines have made a good year's work, and the mining interests of this county generally, may be said to be in a healthful and progressive condition.

In Shasta county vein mining, inaugurated some time ago and since kept up with fair progress made every year, has moved along in its usual channels of late. Some hydraulic mining has also been done in the western part of the county, where there is a good deal of pay gravel, with a tolerable chance for obtaining water, the greatest deficiency in the mines there being lack of outlet, which has much impeded operations on what might otherwise have proved successful enterprises. There are no drift mines in Shasta, and the shallow placers that consisted mostly of gulch diggings, and once afforded good wages to an army of miners, are now pretty nearly exhausted, about all that is done in that line at present being a little hand sluicing.

In the cluster of counties that occupy the northwestern angle of the State, composed of

Trinity, Siskiyou and Del Norte,

Hydraulic mining, the only branch extensively carried on, has met with much encouragement the past year through the increased attention paid to the business by outside parties. There exist along the principal rivers in that section of the State many large bars that are well situated for hydraulic operations, and are known to be rich in gold, but which have as yet been but little worked, no measures having been taken to introduce any large amount of water upon them. There is plenty of water in the neighborhood, and it could be easily carried to points where required for use, but the original stock of miners in that country having been able to make fair wages with such small quantities of water as could be easily and cheaply obtained, have not cared to expend their means in securing an increased supply, nor have they taken steps to induce others to do so. Under this condition of things, capitalists, many of them living from the East, have stepped in, and, through their experts and agents, secured a good many of the best water franchises in that region, some of which have already been utilized through the construction of ditches for conducting large volumes of water upon the mines. The building of other ditches and the outfitting of additional mines will speedily follow, and it will not be long until that entire section of country, arousing from the apathy that has so long characterized it, will be transformed into one of the most lively and largely productive mining fields on the coast. In connection with these water rights a considerable area of good gravel land lying convenient has been by these parties secured, sometimes by location, though generally by purchase. This water, however, is the principal thing, as this is comparatively limited in quantity, while the auriferous gravel is abundant. Whoever owns the water will be able always to obtain readily and at little cost all the mining ground required for its full and profitable employment. And it is in this view of the case that these capitalists, in possessing themselves of the water, have virtually gained possession of nearly the entire country, in which no pursuit can at present be carried on to advantage, except hydraulic and quartz mining, the latter being yet in its infancy, with fair chances of expanding some day into a thrifty, if not a very extensive business.

The Conditions for Prosecuting Hydraulic Mining in These Counties

Are exceptionally good. In the first place, the auriferous deposits are rich and extensive, and of a character that enables them to be easily and cheaply worked. Water is tolerably plentiful, and can, at comparatively little expense, be introduced on the mines, and generally under all the pressure desired. There arises here no trouble from barren stuff's imbedded in or overlying the gravel, nor yet very much from hard cement or the presence of unwieldy boulders. The bars to be worked mostly lie high, insuring ample fall, and where this is insufficient the great rivers, into which nearly all the mines have direct dump, afford perfect outlet, all the tailings dropped into them being carried down stream by the force of the current. There is but little farming land along these rivers, and none that can ever be injured by the mining debris; nor can the latter cause any harm through the shoaling of harbors or navigable waters, as it makes its way into none of these. Hence no complaint of damage done by the tailings from these mines can ever arise, either on the part of the public at large or of private individuals.

Among the properties that have changed hands and the extensive enterprises that have been set on foot in these counties the past year, the following embrace the more important: The old McGillivray ranch, situated on Trinity river, 13 miles west of Weaverville, and comprising a large area of rich gravel deposits, equipped and in working order, with ditches, water rights, etc., has passed into the hands of a New York company—consideration, cash down, $115,000. Though a little out of repair, through neglect of former owners, it is considered a good purchase, and one that under the management of the present Superintendent, John Yule, a veteran California miner, will not be likely to disappoint present owners. There is on this ranch one of the finest orchards and vineyards in Trinity county, though these, in a country where fruits and grapes are so abundant, cannot be made a source of much income, the net profits realized from them not exceeding $4,000 or $5,000 per year.

Commencing in the same neighborhood, and reaching far to the east, are the extensive and valuable gold-bearing lands of the Trinity ditch and hydraulic mining company, with large water privileges, ditches completed and projected, and splendidly outfitted, the washing apparatus here being of the most complete and powerful kind. This property, the largest and one of the best ever aggregated in northern California, is owned by San Francisco parties, who, having purchased it at a very heavy cost, have or are about to associate Eastern capitalists with them in its future conduct. In the same neighborhood, a company, having bought out the right to the entire flow of the North Fork, one of the largest tributaries of the Trinity river, are about surveying the route for a canal to bring the water of this stream on a tract of rich mining ground owned by them on the west side of the Trinity, near Junction City. The improvements contemplated by them will involve an expenditure of $45,000, apart from purchase of water franchise and mining ground, bringing the entire outlay up to about $100,000.

Lying near the southerly extremity of Oregon mountain, not far from the above-described properties, is the Dutton Creek ground, covering a large area of high-grade gravel, lately purchased with the accompanying water franchise of Brown's creek by Judge Thomas Sunderland of San Francisco, at the reported price of $73,000. These grounds will at once be put in condition for active operations, the survey of the ditch line being already completed. The property, with all needed improvements, will cost when completed something over $100,000, and is expected to make a gross annual product of five or six hundred thousand dollars, more than half of it net profit. As regards prospect-

ive valne, this property ranks second to none in Trinity county.

On Taylor's flat, a large har situate on tho east side of the Trinity, 28 miles below the McGillivray ranch, an important enterprise bas lately been set on foot. This comprises ths building of a ditch for conveying 3,000 inches of water on the bar, and the supplying of the latter with powerful hydraulic fixtures and otherwiss putting the property in first-rate condition for gravel washing, which it is expected will commence in the course of a couple of months. This too is an Eastern company, having two or three snbstantial California parties associated with them.

The Buckeye company, organized several years ago, own a large extent of deep gravel banks on Buckeye mountain, also in this county. This was originally n San Francisco company, hut the control of ths property has lately passed into Eastern hands. The ground here is good and carries with it a valuable water right, with ditch and bedrock tunnel nearly completed, the whole being well equipped with washing apparatus. Tho outlay on this proporty to date, approximates $300,000, and while the mauagement has heen a little slow regarding improvements, the enterprise will in tbe snd come ont all right and the investment prove a good one. The gravel beds on Buckeye mountain range from 100 to 800 feet in depth, heing ths deepest in the country, and what is of more consequeuce they carry gold in paying quantities throughout. The Buckeye company have heen obliged to build nearly 30 miles of ditching, an unusual length for that section of couutry, and also a somewhat lengthy hedrock tunnel—a structure, too, not often required there, and hy reason of which preliminary expenses have been increased whils active operations have hsen delayed. Being a strong one, the company will probably not complain much of this hrief postponsment of n success considered altogether certain.

In the northeastern part of ths county, Thos. H. Blythe, the well-known San Francisco real estate owner and capitalist, has heen gathering up a great extent of auriferous ground upon which he designs introducing the waters of Coffee creek and the East Fork of the Triuity, n portion of tho large canal projected for this purpose heing already huilt. On this enterprise Mr. Blythe has expended a good deal of mousy and, considered as a whole, it probably contains the elements of a large success, although the schemo is as yet in hut an inchoate state, the owner's characteristic energy and large means may be accepted as evidence that it will he pnshed to an early completion.

In Siskiyou and Del Norte counties three extensive gravel mining properties, including water rights, etc., have lately heen hought hy San Francisco parties, one of these, known as the Bailey, being situated in the former, and the other two, ths Richardson and the Furguson & Frazier, being in the latter county, and in close proximity to the town of Happy Camp. They all lie on the hanks of Klamath river, which affords them ample fall and outlet. The last two are accontered and making a tolerably large and decidedly profitahle production, hut the other hae no improvements of valne upon it. Those properties are all to be outfitted in superior style, and the present limited supply of water largely augmented, wherehy it is expected that their past production will be increased from three to four-fold. The gravel throughout this region of country pays under hydraulic washing at the rate of 60 cents per cubic yard, the avorago in Trinity county heing not much less. This is from three to four times as much as the average yield in Nevada and other of the more central counties. As the natural facilities for operating in these northern counties are at the same time especially good, they evidently present snperior inducements to those desirous of investing in this particular branch of mining. In concluding our remarks upon this new field of enterprise, it is proper to say that while it offers such manifest advantages for the prosecution of hydraulic operations, it is at the same time rather limited in its scope, the hullion-producing capacities of the country being measured hy the quantity of water availahlo for gravel washing, and which, though very considerable, has now heen so completely appropriated that none can be ohtained except hy purchase, and that at figures which would have heen considered extravagant but one year ago. Nevertheless these franchises can still he obtained at prices that parties having the means to utilize them, through the constructiou of ditches and the purchase of mining ground, can well afford to pay.

Central Mining Counties—Butte, Yuba, Nevada, Placer and El Dorado.

Early in the year work was resumed on the old Banner quartz mine near Tahle mountain, Butte eouuty, in which, over 20 years ago, a disastrous oave occurred, causing the death of several men and leading to a suspension of work in the mine. Ever since it has lain idle, although it had previously yielded over $600,000, demonstrating its productive capahilities. During the year the company now operating it has erected a 15-stamp mill, which, for some months past, has heen and is still running on high-grade ore, showing what could he done with some of our idle mines, if properly managed. The McConnell & Duret Co., near Yankee hill, have also started up their new 10-stamp mill; five stamps are heing put upon the Armstrong lode near hy, and the Buena Vista company contemplates an addition to their crushing facilities.

Gravel mining in Butte is said to he in a flourishing condition. Modoc, Vermilion, West Branch, Big Bar and other companies having resumed work under improved conditions. The Sheppard ditch has been completed to Whisky Flat, giving a fresh impetus to the claims in that section, while the Frost & Reese canal company are now pushing things as fast as the severity of the weather will permit. They propose bringing 5,000 inches of water into Strawherry valley and the adjacent gravel lands, and thereby opening up a large section of country which has heretofors been nuproductive for want of water.

Yuba county is most noted for the several heavy hydraulic enterprises prosecuted within her borders, Smartsville and vicinity being the principal center of these operations.

To the Excelsior company at this place belongs the honor of introducing the electric light, supplying a long-felt want in hydraulic mining. As it is said to work satisfactorily in their mines, many other companies contemplate availing themselves of its advantages.

Nevada County.

Nevada county makes, as usual, a good exhihit of progress, particularly in the department of quartz mining, some new mills and hoisting works having been erected, and several consequential developments made during the year. The Idaho, Providence, Murchie and other companies, which have reached depths of from 500 to 1,200 feet, have found their veins at these levels still strong, and as well-defined and fertile as at points nearer the surface. Encouraged by the success attending former efforts, hoth prospecting and ore extraction have been vigorously prosecuted and attended with good results. Among the new mines coming into prominence here the Live Yankee, situate near ths Providence, is conspicuous, an ore body of extreme richness and great promise having lately heen opened up in this ground. Tho property, which is in good working shape, is owned by Eastern parties who intend to work it for what it is worth and not for a market.

The "trihute" plan of working veins is rapidly growing in favor here, and has heen adopted in most cases where practicahle. It has heen found more satisfactory to all parties as doing away with the necessity of employing so many "hosses," and obviating also the disturhances hitherto growing out of the question of wages. Besides effecting these ends, it places a portiou of the risks on the miners' shoulders, and makes him his own master hoth as to the hours and amount of labor which shall constitute a day's work. It is noticeahle that under this system much more is accomplished, as the remuneration of the miner depends directly on the amount of work he does. Several attempts were here made to work the refractory ores of Meadow Lake the past summer, and, though some of them answered in a small way, nothing has as yet been found that succeeds in handling these ores on a working scale.

While the quartz interests here have flourished, the hydraulic mines have had a short hut fairly prosperous season. The past has heen a good year, too, for drift mining, also extensively carried on in this county, the most active and successful sites of this industry heing on the Liberty Hill divide and the ridge known as Chalk mountain, hoth of which are traversed hy some of the most productive "dead river" chanuels in the country. A rich strike is reported to have occurred late in the fall in the True Blue tunnel on the south fork of Deer creek. This development is one of great interest and importance to the neighhorhood, as it demonstrates the continnity and locates the course of the Red Dog and Chalk Bluff lead, famed in days gone hy for its wonderful fertility. Owing to a partial resumption of operations at various points on Chalk mountain, this locality presents of late something of its former life and activity. This mountain abounds with auriferous leads, the repositories of a great wealth, as shown by the quantities of gold gathered at points where these leads have been exposed hy the action of the streams that cross tbem; and it is time that means should he found to trace these channels up, and secure their contents, heside which the big finds of early times, large as they were, would appear only like a drop in the bucket.

Placer County.

In Placer county we find almost every hranch of mining heing prosecuted actively and successfully. Dutch Flat, Gold Run and the Forest Hill divide are the localities of the more extensive hydraulic operatious. Damascus, Bath and the helt of country reaching from the latter to Yankee Jim's heing the points most noted for drift miniug, which business has recently heen started anew at these and several other localities in the county. Among the prominent hydraulio properties in Placer, the Gold Run, Dardanelles, Pond & Constable and the Breece & Wheeler, occupy the first rank, both as regards extent of ground, water supply, and large and profitahle production. Quartz mining has its seat further west, on the belt of auriferous veins that courses through Ophir, Newcastle and Auhurn, in which vicinage this pursuit flourishes to an extent hardly surpassed elsewhere iu the State. The Julian mine, near Newcastle, occupies a prominent position on this helt, and in some very desirable features stands second to no mine in California, their reserves heing large and the oro of excellent grade.

The Bear River and North Fork Tunnel company are at last making a systematic and determined effort to earry out the object of their orgauization, which consists of driving a tunnel through the ridge that separates the ahovenamed streams, for the purpose of conveying the vast quantities of tailings that havo accumulated in Bear river and its upper tributaries and emptying them into the north fork of the American river. The ends to be subserved by this tunnel would he the supplying of means for re-washing these tailings, which are known to be immensely rich in gold, and also for securing continuous outlet to certain hydraulic mines, which without such relief will, in the course of a few years, he estopped from further gravel washing by reason of the tailings obstructing their dump. The scheme is entirely feasible and if carried out could not fail to prove remunerative and useful. It is one that strongly invites the attentiou of capitalists as promising to be both safs aud profitable.

El Dorado County.

In El Dorndo couuty a good deal of attention continues to be paid to quartz mining. The McNulty, Gold Deposit, Placerville, German, and the Rosecrans companies have all made additions of late to their mills and hoisting works. Ths Placerville (formerly the Pacific) company, hnving added 30 stamps to their crushing capacity, havo now one of the heat equipped properties in tbs State. Hydraulic and drift mining are uot here so extensively engaged in as in the counties further north.

Southern Tier of Counties.

Mining in Amador county, confined almost exclusively to quartz, has made fair progress during ths year. While improvements have been going forward in every direction, the most noted is perhaps the restoration of the old Coney mine, near Jackson, now known as ths Zeile. This property had been lying idle for a number of years, but a company of energetic men knowing its merits have taken hold with a good will, and a 40-stamp mill is now nearly completed. The county contains upward of 25 paying quartz mines. Extensive locations for gravel mining were made the past summer on Mill creek above Volcano, and which it is claimed will pay four dollars per day to the man by ordinary sluice washing.

The Gwin mine in Calaveras county has now been developed to a depth of 1,560, feet and the batteries are kept busy on ore from that level. New hoisting works have heen erected at the Champion mine after repairs made in the shaft, and the owners are now in condition to increase the hitherto very liheral production made hy the mine. The hydraulic and drift mines of this section have also yielded fair returns, the Safe Deposit company having lately made some valuahle improvements in the line of exploratory work and the erection of machinery for reducing indurated gravel.

Tuolumne County.

Tuolumne county has heen extremely fortunate of late, and a general revival of mining interests has taken place there during the past few months. Noted in times past for the number and richness of its pocket deposits, this county adds now to its fame in this respect hy the production of a little honanza of $260,000, which amount was taken out at Sonora a few months since with hand mortars. As a result, prospecting has been the order of the day there, and the neighhoring hills have heen covered with gold hunters who have met with varying success, quite a number of smaller pockets having since been found in the same vicinity. Several new mills have heen erected in Tuolumne during the year, some 16 heing at presont in active operation. A new district called the Olsen is just now causing considerahle excitement, tbe attraction beiug a large vein of burnt looking quartz unlike anything previously found. A town site has been laid ont near the spot, and it is reported that a large force of meu are to be immediately employed on the mine. The Tioga silver district, a late discovery in this county, lies so high in the Sierra that all operations there have heen suspeuded and will not likely be resumed before June. The season closed before any considerable developments could be made, but so far as prospected many of the veins showed promising indications. So many other valuable discoverics and rich strikes have heen recently reported in Tuolumne that it may justly be accounted the rising quartz county of Califoruia.

Trans-Sierra.—Alpine, Mono and Inyo Counties,

Lying east of the Sierra Nevada, have had a somewhat uneven experience.

In Alpine county considerahle exploratory work has been done the past year, and with very fair results. The Colorado company, No. 2, has kept its 20-stamp mill and Frue concentrators busy during the last half of the year, turning out hullion enough to meet the hopes of its friends. A new process of leaching the refractory ores of this seetion is claimed to be a success, making it possible to ohtain a high percentage of the precious metals at a comparatively small cost.

While the gold quartz mines of the Bodie district, Mono county, have about kept up their former rate of production, uo startling developments have been made at that point during the year. Under the exploratory work kept up many claims there have shown such improvement that confidence in the resources of the district has heen well sustained, and there is little doubt hut ore developments of importance will soon be announced.

The fact that Bodie has once or twice in years past heen condemned hy popular judgment and relegated to the wilderness, shows that the superficial style of prospecting hitherto in vogue merits only condemnation.

Probably the hest summary relative to Bodie district we could compile is that showing tbo actual production of the mines for the year. This we take from the *Free Press*, as it shows the bullion shipments tbrough Wells, Fargo & Co. for 1879.

	1878	1879
January	$111,567 07	$201,405 25
February	84,473 56	136,714 44
March	78,449 77	189,404 46
April	76,619 33	238,541 94
May	62,020 15	142,348 20
June	85,912 84	302,885 70
July	110,075 79	172,813 21
August	699 944 33	212,012 10
September	317,020 63	286,288 38
October	170,308 36	193,249 33
November	124,020 69	196,981 23
December	269,323 51	275,201 25
Shipmont by banks	.....	39,000 00
Total	$2,129,732 58	$2,556,847 58
Total shipments in 1878		2,129,732 58
Increase		$427,115 00

The following table gives the total production of each of the mines of the district to December 31, 1879:

STANDARD CON.	
1877	$784,532 80
1878	1,025,383 35
1879	1,448,845 47
Total	$3,758,761 62
BODIE CON.	
1878	$1,042,386 80
1879	764,067 12
Total	$1,080,433 92
BULWER.	
1879	$241,094 39
BECHTEL.	
1878	$58,634 93
1879 (Bechtel)	11,506 85
1879 (Sitting Bull)	3,485 00
Total	$73,626 87
NOONDAY.	
1879	$36,532 29
MISCELLANEOUS.	
1877 (Red Cloud, Mexican and Kate Rogers)	$12,500 00
1879 (shipments by banks)	39,000 00
Total	$51,500 00
SUMMARY OF SHIPMENTS.	
1877	$797,022 80
1878	2,129,732 58
1879	2,556,847 58
Total	$5,483,602 03

The percentage of gold and silver in the production of 1879 is shown hy the following table:

Mines.	Gold.	Silver.
Standard Con	92	8
Bodie Con	85	15
Bulwer	92	8
Noonday	70	30
Sitting Bull	00	10
Syndicate	93	7

The followiug tables show the production of previous years:

SHIPMENTS IN 1877.	
Standard	$784,522 80
Mexican, Red Cloud and Kate Rogers	12,500 00
Total	$797,022 80
SHIPMENTS IN 1878.	
Standard	$1,025,383 35
Bodie	1,042,236 80
Bechtel	58,634 93
Red Cloud	1,027 50
Scattering	1,550 00
Total	$2,129,732 58
SHIPMENTS IN 1879.	
Standard Con	$1,448,845 47
Bodie Con	764,067 12
Bulwer Con	241,094 38
Noonday	36,532 29
Syndicate	12,316 38
Bechtel Con	11,506 85
Sitting Bull	3,485 00
Shipments by banks	39,000 00
Total	$2,556,847 58

Prior to January, 1876, hut 18 claims were recorded in the district; from that date until January, 1878, 206 were made, and the bullion yield amounted to $797,022. During the year 1878, $2,100,409 were extracted, and 360 claims were recorded. In 1879, 374 additional locations have heen made, making in all 958 recorded locations—very few of which have begun to yield—and the gross hullion yield since 1872, $6,385,886. There are already erected, exclusive of whims (horse power), 24 steam hoisting works on the following mines: Standard, Bodie, Mono, Bechtel, Blackhawk, Tioga, Summit, McClinton, Con. Pacific, Butler, South Bulwer, South Standard, South Bodie, Goodshaw, Addenda, Oro, Noonday, Maryland Con., University, Queen Bee, Jupiter, Champion, Spaulding and Booker. There aro erected and in process of erection seven quartz mills, containing 125 stamps, as follows: Standard, 20 stamps; Syndicate, 20; Bodie, 10; Miner's, 5; Bulwer and Standard, 30; Noonday, 30; Spaulding, 10.

Conceruing the districts of Lake, Tioga, Homer, Laurel, Prescott, North Fork and Castle Peak, in this county, and all in the same mineral helt, we have given from time to time such information as we could gather; and last week gave a summary of operations among the principal mines.

Inyo County.

Owing to the refractory nature or the ores, its remote position and other causes, Inyo county is not in a very thrifty conditiou at present, though a few of its mines are doing fairly. The Modoc is still actively at work and a rich strike in the Indiana has recently been reported. The Mexicans in the Beveridge and Old Coso districts are still prospering in a small way, working with arastras. A new district, called Breyfogle, has heen organized 20 miles north of

[CONTINUED ON PAGE 60.]

Tem Pahute District.

CONTINUED FROM PAGE 50.

extent. This mine has a present depth of about 150 feet, a very small amount of development, if rumors of the amount of money expended be correct. There is every reason to believe that the Wyandotte Company have an immensely valuable property, intelligently handled, and everything would indicate that they are a substantial, enterprising company, willing to invest their money in legitimate mining; yet they have certainly thus far been unfortunate in their local management, have done as many an Eastern company has done before them, and placed the management of their enterprise and the disbursement of their money in the hands of parties entirely innocent of the slightest knowledge of mining affairs. Although we have for years occupied but a modest position among the mining camps of Nevada, we know that we have every resource and every element of bonanza, and we look confidently for a day in the near future, when Tem Pahute will assume the position to which it is entitled as one of the leading silver-producing camps of the State; and its immense mineral wealth, instead of slumbering in its mountain fastnesses, will be poured into the lap of commerce. NAFUINTAH.

OXIDATION OF IRON AND STEEL WHEN IN JUXTAPOSITION.—In a paper read before the Iron and Steel Institute, at its recent Liverpool meeting, Mr. G. Radcliffe incidentally mentioned a case in which steel boiler plates had, when exposed to the same circumstances as adjoining iron plates, distinguished themselves by pitting more than the latter, the steel plate next to the iron being oxidized considerably more than any other. The following analysis by Mr. Edward Riley gives the chemical composition of the steel:

Carbon	0.330
Silicon	0.102
Sulphur	0.065
Phosphorus	0.066
Manganese	0.518
Copper	0.053
Iron	99.320

Mr. Radcliffe's conclusion, although he does not distinctly state it, is that it will not do to place iron and steel side by side.

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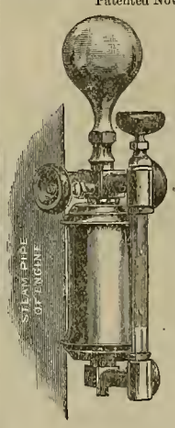
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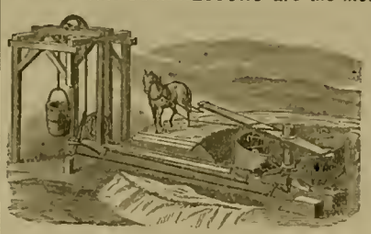

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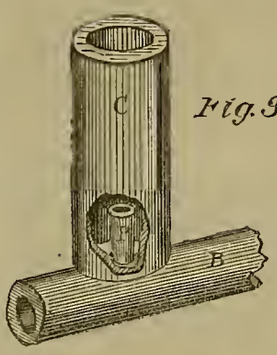

Fig. 3.

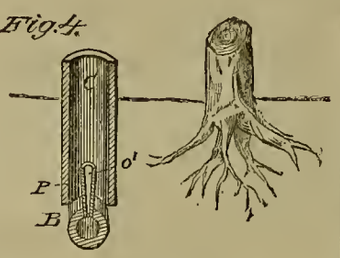

Fig. 4.

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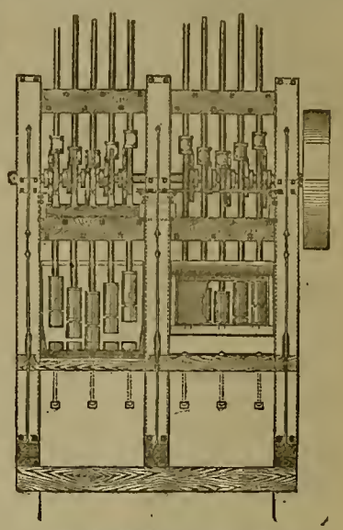

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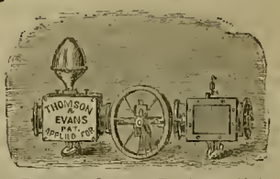

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It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

Mines and Works of Almaden.

Translated from "Annales des Mines"

BY S. B. CHRISTY.

Full geological description of this famous Quicksilver Mine, illustrated by maps and plans of the works. Complete description of the Quicksilver Furnaces and Condensers, etc. 48 pages octavo—paper cover—price (postpaid) 50 Cts. Published and sold by DEWEY & CO., [202 Sansome Street, S. F.

CONTINUED FROM PAGE 53.

free from sulphurets. The lead is three ft wide, and the ore extends from wall to wall. Assays go over $2,000 to the ton.

SILVER KING.—J. S. Mansfield has bonded 60,000 shares of the Silver King mine for $1,200,000. This is the interest held and controlled by J. M. Barney, and as there are only 100,000 shares, it will give Mr. Mansfield the controlling interest in the mine and mill property.

IDAHO.

PARADISE.—Yankee Fork *Herald*, Jan. 10: The new tunnel tapped the vein about 100 ft below the old one, and the workmen are driving ahead in three ft of very soft chloride ore that assays from $50 to $300. It now shows a chimney of at least 100 ft of this quality of ore, and how much farther it extends will be proved as the tunnel advances. There is every indication that the present fine body of ore encountered in the lower tunnel extends throughout the location. The Paradise is now developed to that extent that it adds another to the list of paying mines of the district.

ITEMS.—*World*, Jan. 16: Walt, Coffin & Co. have opened their mine on the extension, where they have a two-ft vein of ore that will go $100 per ton. Mr. D. Bacon has struck rich prospects in his mine, three miles south of Shaws' Mountain. Mr. Plowman speaks in flattering terms of Shaws' Mountain district, which he believes will be a good camp next year. Besides the mines that are now being worked, he says there is abundance of ore in that country that will mill $20 per ton.

Hofmann's Patent Process.

EDITORS PRESS:—In your issue of Decemher 17th, Mr. Deetken expressed bis opinion ahout Hofmann's process, which, I think, was not correct. It was nowhere alleged that these processes in themselves are new; but the comhination of two known processes is new. There was also nothing written ahout "silver-bearing gold sulphurets," hut "auriferous silver ores;" although there is not the slightest douht that this process is applicahle to gold sulphurets with the same advantage. Mr. Deetken says that he introduced the Patera process, preceding Plattner's, at the Eureka mine, Grass Valley, in 1865 (?). He writes, also, "in my hands, hoth methods gave equally as good, or, in other cases, as poor, results ou such argentiferous gold ores as I treated, with the advantage in favor of the Plattner-Patera against Patera-Plattner method, on account of simplicity of the former." So simplicity decided in "experiments," of course. I have often had au opportunity to ohserve that the hest process, in unskilled hands, gave a poor resnlt, and it is very questionahle whether the "experiments" of Mr. Deetken have heen executed with the same precision as Hofmaun's practical work of five months, with an extraordiuary result. Tho success is the *"argumentum ad hominem,"* not the failure. But, after all, Hofmann's process has nothing to do with Patera, hefore or after Plattner. His process is a comhination of Kiss and Plattner's processes. There is a similarity, hut no identity, hetween Patera and Kiss' process; and, among others, the most important difference hetween the two is that the Kiss process extracts gold, where Patera's does not.

There is a particnlar circumstance in Hofmann's process, and probahly also in the comhination of Patera and Plattuer, which, if not strictly observed, results in an imperfect extraction of gold. If, after using the byposulphite of lime for the extraction of silver, the ore has not heen washed perfectly, so that some hyposulphite—eveu the least quantity of it—remained in the mass, a poor result will he the consequence.

Another of your correspondents could not see a novelty in Hofmann's process. The novelty is the comhination, crowned with success. But these gentlemen are patentees themselves, and I shonld like to know where the novelty is in a patent process; for iustance, in the plain Plattner's chlorination process or in the use of suhchloride of copper for amalgamation of silver ores? I wonder also, that after I pnhlished "Kustel & Hofmaun's process," ten years ago, a comhination of Patera & Plattner's processes, *first practiced by Kustel & Hofmann*, how it happens that nothing was made known at that, time ahout those "experiments" in Grass Valley?

Mr. Deetken calls also Hofmanu's attention to several piles of sulphuret tailings, assaying from $12 to $18 per ton. In this case there is only one thing proved, viz., that he who left $18 in the tailings did not uuderstand how to treat the sulphurets properly. G. KUSTEL.

ACADEMY OF SCIENCES.—The regular semi-monthly mocting of the California Academy of Sciences was held on Monday eveniug last, President Davidson in the chair. Among the donatious were specimens of conifers from Santa Lucia mountains, collected by Prof. Davidson, and some petrifactions from Florence, Arizona, presented by Dr. Harkness, showing the marks of stone-cutting instruments. B. B. Redding read an interesting paper ou the "Buried Treasures of Our Ancestors," referring to the finding in several localities of numerous plates of obsidian, the uses of which were an archæological problem. His theory, horn of his obserʼvations among those tribes of Indians in California and Oregon that still use the how and arrow, was that the obsidian was collected for the manufacture of arrow-heads. He had found that mineral was the mainstay of several tribes, who made journeys of sixty miles to collect it on Mount Shasta, and frequently fought battles with other tribes to get at the precious mineral. Prof. Davidson described the general facts connected with the recent eclipse, his remarks being given in another column of this issue.

Mines and Mining in 1879.

CONTINUED FROM PAGE 57.

Panamint, where what are spoken of as promising discoveries have heen made, though not enough work has yet heen done ou the lodes to determine their value.

Mariposa County.

Mariposa has made hut little progress during the year. The Hite mine has added 20 stamps to its crushing power, indicating that there is plenty of ore still in sight in this mine, despite the large quantity already extracted. The Furguson company still keep their mill husy, with satisfactory results. The old Virginia, recently purchased hy Eastern parties, is turning out satisfactorily. The present owners purchased a large amount of machinery, which for years lay idle in Hunter's valley, and erected from it a very good mill, with which they hope soon to reimburse all expenditures and afterwards earn fair profits.

Discoveries of tin are reported in Fresno county, hut at points so remote that, everything considered, they are not probably of much practical value. During the summer a numher of gold and silver-hearing ledges were discovered in the eastern part of the county, some of them of great size and possibly of value. They lie in an elevated region, where the working seasons are so short that their development, if undertaken, must necessarily he slow. The New Idria, in this county, contiuues to rank among the leading quicksilver mines of the coast. Many other mines of this metal are located in the vicinity, hut they have not heen developed, owing to the low prices for this metal prevailing for some time past.

Monterey, San Luis Ohispo and Santa Barbara counties had in the early part of the year quite a breeze of excitement over the reported discoveries of placers within their limits. It has heen found, however, upon trial, that these diggings will pay only the smallest wages, hardly more than a dollar a day to the man on the average.

Rumors of gold and silver discoveries in the Santa Cruz mountains and other points in the Coast range have heen rife during the year, but little has come of them.

The Carmelo coal mine near Monterey, a late find, is producing an article of fuel which compares favorably with Wellington coal, and finds sale in this market at about $10 per ton.

Some placer mining is going on in San Bernardino county, and more might he done were the water supply more plentiful.

The working of the tailings from the old Gold Mountain mill employs a number of hands, and is said to he remunerative.

The Ivanpah section is struggling again to get on its feet. Two mills are running there, and the mines though somewhat spotty and irregular contain many small but very rich pockets that hring the ore up to a pretty high average grade.

From the Julian and Banner quartz districts, San Diego county, hut scant information has come to hand, while the placers discovered last year at the base of the San Isidro mountains failed to show staying qualities, the gold being scarce and water in limited supply.

Quicksilver.

With the exception of quicksilver and coal, not much has heen done the past year towards utilizing our useful metals or minerals; the had condition of the markets and the cost of production here having discouraged efforts in that direction. The quicksilver yield of California amounted for the year to 73,684 flasks, heing over ten thousand flasks more than was made the preceding year, and much the largest annual production ever turned out hy our home mines. Prices meanwhile have shown some improvement, advancing from five to six cents per pound towards the end of the year, when they ruled at ahout 41 cents. The prospect at present is that the market will remain firm and most likely show a further advance, as it now transpires that we have for some time past heen considerahly under-estimating the world's consumption of this article. The year opens with an improved outlook for California mine owners, who for the past three years have made hut little money out of the business, owing to the extremely low prices of quicksilver. The following tahle shows receipts of this metal at San Francisco for the year, with names of principal mines now heing worked in this State:

Receipts of Quicksilver in San Francisco for the Years 1878-79.

CONSIGNEE.	Mine.	Flasks. (1878.)	Flasks. (1879.)
Thos. Bell & Co.	New Almaden	15,249	20,700
M. Dore	Guadalupe	9,072	15,540
Parrott & Co.	Sulphur Banks	9,240	9,242
H. M. Newhall & Co.	Great Western	4,866	7,021
Thos. Bell & Co.	New Idria	5,138	4,425
Redington & Co.	Redington	6,687	4,170
Daniel Meyer	Oat Hill	3,049	3,605
Altoona Q. S. M. Co.	Altoona	1,435	1,906
W. W. Traylor	Oakland	1,615	1,505
Parrott & Co.	Great Eastern	1,286	1,470
Merchants' Ex. Bank	California	1,434	1,026
Eggers & Co.	Pope Valley	600	989
Merchants' Ex. Bank	Oceanic	1,679	779
C. Langley & Co.	St. John	387	546
W. W. Dodge	Cloverdale	116	18
Parrott & Co.	Mt. Jackson	168	15
H. C. Egerton	Sunderland	472	.....
Sundries	Sundry Mines	1,001	717
Total		63,484	73,684

MONTHLY.

Month.	Flasks. (1878.)	Flasks (1879.)
January	4,142	5,734
February	2,484	5,539
March	3,313	5,145
April	5,333	5,377
May	6,210	6,164
June	5,279	7,099
July	5,627	6,883
August	6,349	6,282
September	5,586	6,848
October	6,256	6,310
November	6,775	6,509
December	6,130	5,794
Total	63,484	73,684

Borax.

Unlike quicksilver, last year's product of horax shows a great falling off as compared with that of the year hefore; the quantity of this salt turned out hy the horate fields of California and Nevada has, in fact, hecn diminishing steadily and rapidly for the past four or five years; the low prices that have prevailed having rendered the husiness not only profitless, hut, to such manufacturers as persisted in carrying it on despite natural disadvantages, wholly ruinous. Even the Riddell, California company, who possess great natural facilities for the cheap prosecution of the husiness, found it expedient to suspend operations for a time last year, not resuming them till the month of August, since which they have turned out at the rate of ahout 100 tons per month, the total production of the coast, nearly all made hy this company, having amounted to 1,554,986 pounds for the year. In 1876 there were gathered from domestic sources 5,180,810 pounds of marketahle horax, the product dropping the next year to 3,727,280, and in 1878 to 2,802,800 pounds, the rapid declension being due mainly to the low prices brought about through a mistaken idea on the part of the foreign consumers that the horate deposits in California and Nevada were so extensive and prolific as to threaten an immediate glut of the market. This having turned out otherwise, the stock has everywhere run low, causing a slight advance in price, at present 8 to 10 cents per pound in this market. With the check given to home production, importations of horacic acid have heen quite heavy at the port of New York the past year, suggesting the propriety of some protection heing extended to the home interest in the shape of a slight duty on this article.

Coal.

Coal mining on this coast has heen tolerahly active the past year, 387,000 tons of this fuel having heen extracted during the year. Of this total, 230,000 tons came from mines on American territory, and the halance from Vancouver Island, British Columbia. From the Mt. Diahlo mines in this State, 134,435 tons were raised, 45,909 from Coos Bay, Oregon, and 135,012 tons from the Seattle mines, Washington Territory. The Bellingham Bay mines, in that Territory, made no production the past year, though it is expected that extraction will soon he resumed at that point. Receipts of Rocky Mountain coal, some of which came to this city a few years since, have this year ceased altogether. The output from the Ione mines, Amador county, amounting to 765 tons in 1878, and 3,458 tons the year hefore, has also heen discontinued. From the mines heing opened at Carmel Bay, Monterey county, 425 tons, first receipts, have come to this market the past fall; also 845 tons from the Tacoma mines. Extraction from the Carhondale pit amounted last year to 1,229 tons, against 4,022 the preceding yoar. With a somewhat diminished home product of late, imports of this article have also decreased, though they still continue large, aggregating over 200,000 tons last year, the principal part coming from Australia, and heing employed here in the rolling mills and for the manufacture of gas.

The Mt. Diahlo coal is used mainly for steam purposes, heing employed to that end hy the foundries, machine shops, mills, factories, etc., and also by our harhor tugs and river steamers, the Vancouver heing preferred hy sea-going craft. Operations at the Mt. Diahlo mines are at present very active and likely so to continue for some time to come. At Coos Bay some revival of mining is also reported, and it is prohahle the quantity of coal raised at that point will he larger the current year than for some time past. To the Newport mines the steamers *Arcata* and *Gussie Telfair* will make regular trips, freighting down coal. At the Eastport and the Oregon mines work will also he pushed. The latter is situated on the Isthmus proper, at the head of deep-water navigation, where extensive improvements have been made and some good coal ohtained, none of which has, however, yet found its way to the San Francisco market.

Five miles from navigahle waters are the Utter and Northern Pacific mines, from the former of which several thousand tons of coal of excellent quality have heen shipped to this port.

On the Northern Pacific property a tunnel 650 feet in length has heen run, which cuts a vein of coal 4½ feet in thickness. This tunnel extended will intersect several other veins, the larger of which are from five to six feet in thickness.

These mines are reached from navigahle water sufficient to float a vessel of a thousand tons, and hy a railroad five miles in length.

The Coos Bay coal is of the soft or brown variety, and of superior quality, heing suitable for steam or domestic uses, and fully equal to the Seattle coal.

Copper.

In copper mining, which during the past three or four years had dwindled to very meager proportions, some signs of a revival are to he detected. The receipts of ore at this point during the past twelve months were insignificant, consisting of some small lots from various California mines, amounting on the whole to only a few hundred tons. Several small lots from Del Norte county were of very high grade, and a contract has heen made for the early delivery here of 600 tons of a like quality. At Spenceville, in this State, extensive works have just heen completed, whereat large quantities of ore will he treated hy the lixiviation process. At the Newton mine the same method has heen adopted and a large amount of copper ore will there also he handled the present year. The Eagle mines of Calaveras county, having been relieved from the legal troubles that emharrassed the company, will at once resume operations, and as the price of copper has somewhat improved of late, a general if not very marked revival of this industry may soon he looked for.

It would seem as if with such an ahundance of the ores of this metal within easy reach we ought to mine and manufacture sufficient for our home wants, if not some to spare. It is a fact, however, that while we are producing and shipping a limited quantity in a crude state, there exists as yet no very large and complete estahlishment for its manufacture into a merchantahle shape. This is due, in part, to the more attractive forms of mining for gold and silver, and in part to ill-advised ventures made in copper mining hefore conditions justified the same. We helieve, however, that a fair amount of capital could now he profitahly employed in the erection of copper reduction and manufacturing works on this coast. Such an estahlishment would immediately stimulate to activity a great numher of copper mines which now lie idle hecause they cannot pay the heavy freights and other expenses accruing on ores shipped to distant markets. Under the present conditions we find it impossihle, except in rare instances, to handle ores containing less than 15% of the metal, whereas the average of all beneficiated in England does not exceed 5%. As we are rapidly gaining on that country in many other branches of industry, it seems strange that we should be hehind hand in this, where our advantages are as three to one.

Our immense heds of good iron ores remain untouched. Our tolerahly ahundant deposits of petroleum are heing partially utilized, hut, as yet, on no large scale, and with hut a partial success. Our sulphur hanks, also quite large, have heen opened and supplied with reduction works, hut have, as yet, turned out only a limited quantity of the refined material, owing to the local requirements heing met in so large degree hy importations from Italy and Japan. While we have antimony, nickel, plumhago, manganese and various other metals and minerals of economic value in great ahundance, none of these have been utilized to a noticeahle extent the past year, the entire ore movement at this point having been less than for some time hefore.

NEVADA.

The most notewortby event connected with mining operations in this State the past year is the marked decline that has occurred in the product of the Comstock mines and the failure to open up any new ore bodies of large value on that lode, notwithstanding the heavy expenditures made in prosecutiug explorations along it meantime. About the middle of the year the Sutro tunnel, having heen brought to completion, hegan soon after to extend some relief to a portion of the mines that had much water to raise, and later on to several others that had heen connected with the lateral tunnels driven toward them. The revenues of the tunnel company in the interim remain small, the quantity of ore extracted from the mines subject to royalty heing inconsiderahle. As regards the prospects for early ore developments of importance on the Comstock range, it is impossihle to speak with assurance, the hest authorities on the subject heing not agreed on that point. Despite these uutoward results, work on the leading mines is kept up and even pushed with energy, as it will no douht continue to be throughout the present year.

At several other localities in the State a good degree of activity has also prevailed, notahly so at Eureka, Tyho and Tuscarora, ahout Columbus, in the Bristol, the Paradise, and one or two other districts, at all of which places the mines are looking and yielding well, while at some valuable ore finds are reported for the year. At several localities in the State mining has languished, while at a few the experience had on the Comstock has, in a small way, found its counterpart. The long and costly tunnel heing driven under Treasure hill, White Pine, hy the English company owning mines there, has failed to develop any valuable ore hody, or even strong signs of such, notwithstanding work has heen kept in progress most of the year. The outlook for that unfortunate locality is by no means cheering. The large shaft being sunk on the Real Del Monte ground, at Aurora, in the Esmeralda district, has gone steadily downward without encountering ore, though late indications are considered favorahle. Should this shaft prove a success, it would lead, no douht, to a revival of operations in that neighhorhood, a great many mine owners there awaiting the results of this experiment to determine whether or not they will again resume work on their claims. Should it, on the other hand, prove a failure, such result would be likely to delay any general resumption of work ahout Aurora, and possibly lead to its indefinite postponement.

As the Comstock may he supposed to have reached its minimum of production and there

are now a good many fairly prosperous mines in Nevada, with others just coming into honanza, and even whole districts that promise an early increase of their present yield, it may be expected that the bullion product of this State the present year will equal if it does not surpass that of 1879. Eureka, Tuscarora, Paradise, Tybo, Bristol, Como, Grantsville and the Candelaria or Columbus being some of the districts which may be expected to sustain and perhaps advance their present production.

Other Statee and Territories.

Touching the value of the precious metals likely to be extracted in the other bullion-producing States and Territories tho current year, it may be observed that some increase on last year's yield may be looked for in the case of almost every one of them, if the reports coming to us through the usual channels of information are to be relied upon. Arizona will this year begin to realize more fully something of the benefits that must surely come to her through the liberal investment of outside capital, the erection of additional reduction works, and the extention of the Southern Pacific railroad almost to the center of the Territory, to say nothing of the aid and encouragement she may be expected to derive from other roads approaching her from the East. The outlook for that country is good, to say the least.

Aside from some addition to the means employed for extracting and handling the ores, a slight appreciation in the prices of lead can hardly fail to stimulate mining somewhat in the Territory of Utah, where this industry is at present in a generally healthful condition. It is agreed on all hands that Colorado will be able to maintain her present rate of production, and may even advance it to the extent claimed by the local press and other recognized authorities of that country. The deposits at Leadville, though shallow and failing to yield anything like the values predicted for them at the time of their discovery, have, nevertheless, made a marvelous production, with a chance of being able to keep it up for some time to come. Dakota and Montana will also be sure to make some gains this year, while New Mexico, Idaho and Oregon should at least hold their own. Washington Territory, through the placers lately discovered on Skagit river, will do much better this year than ever before, while Alaska, though she may not swell the grand total much, will come in for the first time as a bullion producer.

News in Brief.

THE Princess Louise is about to return to Canada.

THE will of Frank Leslie is to be contested by his son.

THE School of Design in this city opened with 43 pupils.

RUSSIA is still secretly continuing her preparations for war.

NEGROES are arriving in Kansas from Texas in great numbers.

THE Duchess of Marlborough relief fund amounts to £19,000.

MAYOR KALLOCH'S condition is causing his friends much anxiety.

GOLD placers have been discovered near Hopland, Sonoma county.

IRA GILCHRIST, a well-known architect in Napa county, is dead.

PROCESS-SERVERS in County Mayo, Ireland, are having a rough time.

A CONCORDAT between Germany and the Vatican is about concluded.

THE damage in Washington Territory by the late storm is placed at $50,000.

GEORGE BRAGG was accidentally hung recently in Douglas county, Oregon.

AN excursion to this coast on a large scale is to take place from Boston in April.

A DARING robbery was recently perpetrated in broad daylight in a Chicago street.

CHANCELLOR HARTSON was elected on Friday last Assemblyman from Napa county.

THE murderer of Jacob Swanger, at Hillsboro, Oregon, has confessed his crime.

IN the recent fight with the Montenegrins the Albanians lost 45 killed and 60 wounded.

SILVER in London, 52⅜; consols, 97 15-16; 5% U. S. bonds, 105⅜; 4s, 107¼; 4½s, 111.

THREE persons were killed and twenty injured Friday, at Southport, Eng., in a railway collision.

DR. CONGAR, of Pasadena, has sold, so far this season, 65,000 grape cuttings, chiefly the White Muscat, for raisins.

IN the State Assembly it has been agreed to refer all hills hearing upon the Chinese question to the Committee on Chinese.

IN San Francisco, half-dollars are quoted at par; trade dollars, 95 buying, 96½ selling; Mexican dollars, 96 buying, 96½ selling.

IN the State Senate the question of reference of bills to the San Francisco delegation, has been decided in favor of the delegation.

THE Republican Legislature of Maine on Saturday elected and inaugurated Daniel F. Davis, Governor, together with the balance of the State officers.

WITHIN the last 13 months 172 bears have been killed on the sheep ranch of Hanson, Porter & Russ, Humboldt county, and between 250 and 300 wild cats.

NOW that Bishop Haven has fallen a victim to malarial fever contracted in a needless visit to Africa, many influential Methodists are bestirring themselves to abolish the practice of sending a bishop abroad every year, and are advocating native resident bishops.

STEEL CASTINGS.—The Chester Steel Castings Co —office, 407 Library St., Philadelphia, works, Chester, Pa.—have in the last few months doubled the capacity of their works by lengthening their main foundry building, and adding to it an L 60x80 feet, and have also erected a larger furnace, larger steam engine and boilers, etc. They are doing double the work they were in the spring. Are filling orders for steel castings from nearly all the locomotive builders in the United States, also from railway companies, engine builders, machine shops and agricultural implement manufacturers, and for wood-working machinery.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

A Cylinder Preseman

Of good experience wants a situation in a S. F. or interior office. Understands running an engine. For a steady situation will accept moderate wages. Address "No. 2," this office.

An Engineer

Wants a situation to run a stationary engine in the city or country. Will accept a moderate salary. Address "No. 1," this office.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.

WEDNESDAY M., January 21, 1880.

IRON.—		
American Pig, soft, ton	28 00	@35 00
Scotch Pig, ton	26 00	@30 00
American White Pig, ton	25 00	@—
Oregon Pig, ton	28 00	@35 00
Refined Bar	4 @	8
Horse Shoes, keg	5 00 @	—
Nail Rod	—@	8
Norway, according to thickness	7 @	8
COPPER.—		
Sheathing, lb	22 @	—
Sheathing, Yellow	18 @	—
Sheathing, Old Yellow	8 @	—
Nails	25 @	—
Bolts	24 @	—
Brazier's, in all sizes	24 @	30
Old	16 @	—
STEEL.—		
English Cast, lb	16 @	17
Black Diamond, ordinary sizes	16 @	—
Drill	16 @	17
Flat Bar	16 @	19
Plow Steel	8 @	—
TIN PLATES.—		
10x14 I C Charcoal	8½@	9
10x14 I C Coke	7 @	7
Banca Tin	18 @	20
Australian	15½@	17
ZINC.—		
By the Cask	9 @	—
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@	10
NAILS.—		
Assorted sizes	3 50@	4 50

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juan County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Fourth (24th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No 420 Montgomery street, San Francisco, California.

Butte Hydraulic Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Poirson	13	2½	$25 00
L Lapierre	22	2½	25 00
H Marceux	24	2½	25 00
J B Lussier	25	2½	25 00
John Britt	26	2½	25 00
Geo W Deitzler	37	5	50 00
N Desautelle	41	2½	25 00
Jos Lucier	42	2½	25 00
N Goldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervais	45	10	100 00
Geo Moreau	46	5	50 00
Geo W Deitzler	47	15	150 00
A S Hawes	17	10	100 00
J Callandreau	4	10	100 00
A M Wilder, Trustee	1	10	100 00
A L Leugfeld	5	5	50 00
L L Dennery	6	5	50 00
W E Lutz	7	5	50 00
Geo. H. Powers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francisco California, on Monday, the 22nd day of December, 1879 at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 3, No. 220 Sansome St., San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock of the Butte Hydraulic Mining Company is postponed to the Fifth day of January, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock is postponed to the second day of February, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

San Francisco, Cal., January 3d, 1879.

Gila Silver Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Reveille Mining District, Nye County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of January, 1880, an assessment (No. 6) of twenty-five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, Safe Deposit building, 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Seventeenth day of February, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the Ninth (9th) day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. W. PARRISH, Secretary.

Office—Room 7, Safe Deposit Building, No. 328 Montgomery street, San Francisco, California.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the 24th day of December, 1879, an assessment (No. 40) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the First day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California Location of works, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Fourteenth day of January, 1880, an assessment (No. 2) of Ten Cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. Gold coin, to the Secretary, at the office of the Company, room 1, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 11th day of March, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

A. C. TAYLOR, Secretary pro tem.

Office, 314 Bush street, San Francisco, California.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE ..... Manager.
CHAS. H. GOODWIN ..... Treasurer.
J. P. CHAPMAN ..... Assistant Treasurer.

CLARA MORRIS.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE ..... Lessee and Manager

MELVILLE OPERA COMPANY.

Open every evening and Saturday Matinee.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half-year ending this date, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a Dividend on Term Deposits at the rate of Six and Nine-Tenths (6 9-10) per cent. per annum, and on Ordinary Deposits at the rate of Five and Three-fourths (5¾) per cent. per annum, free from Federal Taxes, and payable on and after the 15th day of January, 1880. By order. GEO. LETTE, Secretary.

San Francisco, December 31st, 1879.

ANNUAL MEETING.

The Annual Meeting of the stockholders of the GLOBE CONSOLIDATED MINING COMPANY will be held at the office of the Company, room 2, No. 106 Leidesdorff street, San Francisco, California, on THURSDAY, the 5th day of February, 1880, at the hour of 12 M, for the election of a Board of Directors to serve the ensuing year and the transaction of such other business as may properly come before said meeting.

O. H. BOGART, Secretary.

San Francisco Jewelry Manufactory.

D. W. LAIRD,

27 Post St., bet. Kearny and Montgomery,

(Opposite Masonic Temple.)

Watches, Jewelry and Diamond Work, Badges and Medals, For sale and made to order.

Quartz, Turquois and other Stones cut and set.

Watches and Jewelry repaired by skillful workmen.

Dewey & Co { 202 Sansome St. } Patent Ag'ts

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Importer and Dealer in all kinds of

Coal and Pig Iron,

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Connected with the American District Telegraph. Orders sent through this medium will receive prompt attention.

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Office, No. 6 California Street,

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Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire

Of all sizes on hand or made to order.

Barbed Fence Wire.

Sole Proprietor of

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For the Transportation of Ores, Etc.

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BRASS and BELL FOUNDRY

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MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS

BRASS CASTINGS of all kinds,

WATER GATES, GAS GATES,

FIRE HYDRANTS,

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General Assortment of Engineers' Findings.

Hooker's Patent Celebrated

STEAM PUMP

The Best and Most Durable in use. Also, a variety of other

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For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

For Mining Purposes.

Garratt's Improved Journal Metal.

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IRON PIPE AND MALLEABLE IRON FITTINGS

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES.

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PATENT DETACHABLE TOOTH SAWS,

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DeGROOT, BIRGE & CO.,

Mining Engineers & Assayers,

Examination of and Reports on Mines a Specialty.

Room 25, 318 Pine Street, San Francisco.

(Elevator, No. 10 Leidesdorff street.)

Old Assaying Business,

WITH TOOLS,

FIXTURES and FURNITURE,

For Sale.

(Established 12 years in San Francisco; now going East.) Apply at first to X. Y. Z., this office.

Engraving. Superior Wood and Metal Engraving, Electrotyping and Stereotyping done at the office of the MINING AND SCIENTIFIC PRESS, San Francisco at favorable rates.

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ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St. (rear of Ætna Foundry),

J. V. HALL,

PRACTICAL BOILER MAKER.

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK,

Repairing promptly attended to at the lowest possible terms.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

SACRAMENTO, CAL.

PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Treetle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS. WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California,

SAN FRANCISCO, CAL.

Golden State & Miners Iron Works,

Manufacture Iron Castinge and Machinery of all Kinds at Greatly Reduced Ratea

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

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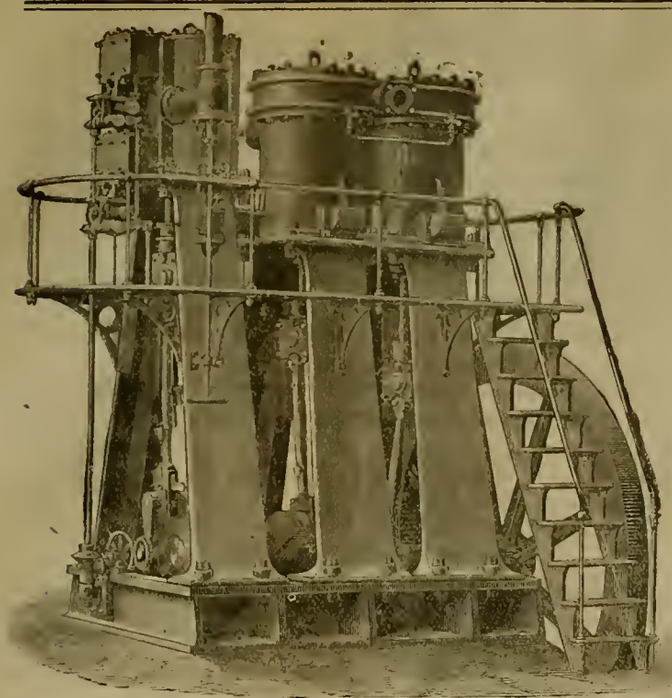

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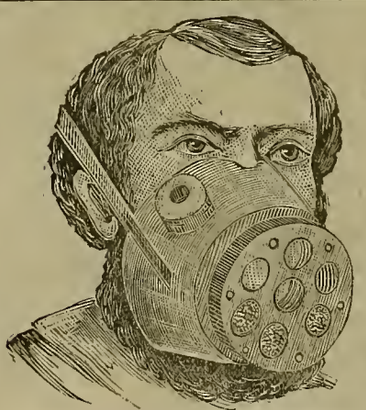

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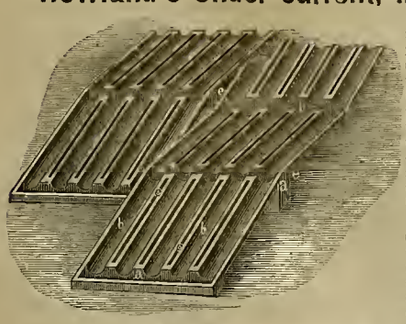

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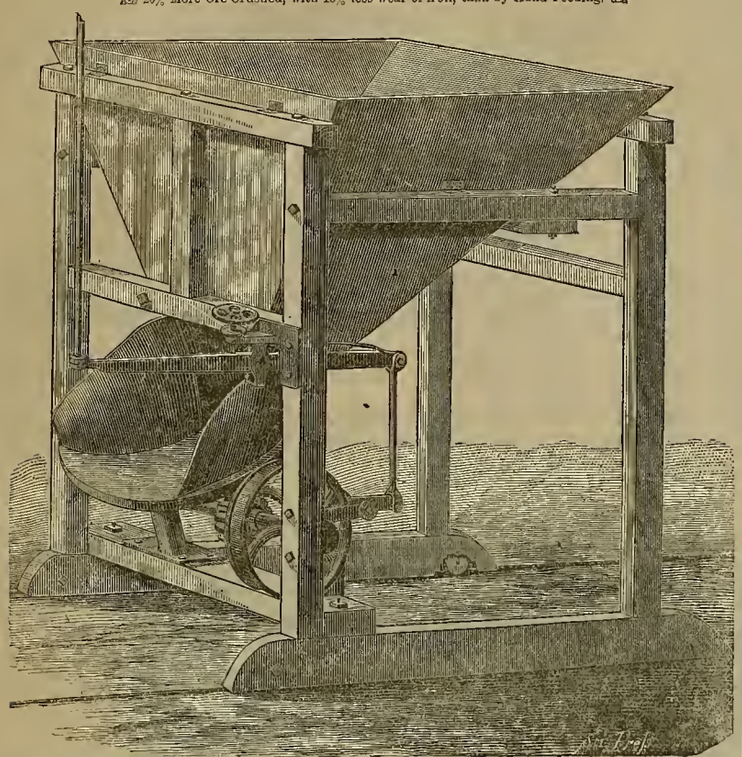

It may be considered as now fully demonstrated, by careful and long-continued 'experimentation, that the plan upon which a perfect Ore Feeder must be constructed is that of the *carrier*, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply *dropped*. Spasmodic or jerky contrivances will not answer the purpose for wet, sticky ores.

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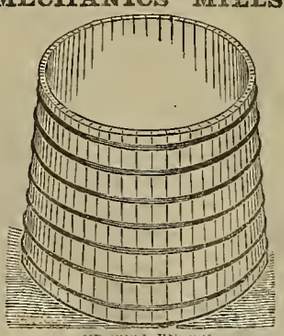

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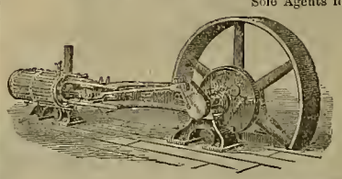

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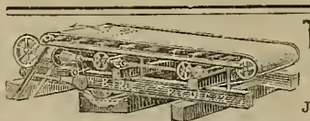

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SAN FRANCISCO, SATURDAY, JANUARY 31, 1880.

VOLUME XL Number 5.

Protecting Stockholders in Mining Corporations.

Assemblyman Felton has introduced several hills dnring the present session of tbe Legislature looking towards reform in the matter of the management of mining corporations. Tbe following are the important sections of one of thom:

SECTION 1. It sball not be lawful for the directors of any mining corporation to sell, lease, mortgage or otherwise dispose of the whole or any part of the mining ground owned or held hy snch corporation, nor to purohase, or obtain in any way, any additional mining grounds unless sucb act be ratified by tbe bolders of at least two-thirds of tbe capital stock of sucb corporation. Snch ratification may be made either in writing signed or acknowledged by sucb stockholders or by resolution duly passed at a stockholder's meeting called for that purpose.

SEC. 2. All stock in eacb and every mining corporation in this State shall stand in the books of said company, in all cases, in tbe names of the real owners of sncb stock or in the names of the Trustees of snch real owners, but in every case where snch stock shall stand in the name of a Trnstee, the party for whom be holds sucb stock in trnst shall be delinquent upon said books and also in tbe body of the certificate of such stock.

SEC. 3. It shall not be lawful for any corporation, or the Secretary thereof, to close tbe hooks of said corporation more than two days prior to the day of any election. At such election tbe stock of said corporation sball he used by the *bona fide* owners thereof as shown by the books of said corporation, unless the certificates of stock dnly endorsed he produced at snch election, in which case said certificates shall be deemed tbe highest evidence of ownership thereof.

One of the other hills, introduced hy this gentleman, amends an act passed March 21, 1872. The first section of the bill is the all-important one, and that amends the first section of the act referred to as follows: Upon the petitiou of the *bona fide* owners of one-fourth of the capital stock of any corporation formed for the purpose of mining, to a Superior Judge of the county where said corporation has its principal place of business, to the effect that they are severally tbe *bona fide* owners of the number of shares set opposite their signatures to the petition, said Superior Judge shall issue notice to the shareholders of said company that a meeting of the shareholders will be held, stating the time not less than five nor more than ten days after the first publication of such notice designating tbe said place of meeting within said county, and tbe subject to he taken into consideration, the removal of one or more directors or other officers, which notice shall be signed hy said Judge, and shall be published daily in one or more daily newspapers published in said county at least five days, and not exceeding seven before the time of said meeting. It shall be tbe duty of tbe Secretary of said corporation to produce at sucb meeting the stock and all other books of said corporation, sbowing the owners of stock therein, and any failure of the Secretary to produce such books shall be doemed a contempt of the Court of which said Judge making the order is Judge, and he shall be imprisoned by order of said Judge until be produce such books, and shall also be fined in a sum not exceeding $1,000. A *bona fide* stockholder sball be deemed to be the actual owner of tbe stock, whether issued to him or to another in trust for him. Proof of ownersbip of stock sball be made hy the production of tbe books of the said corporation, or tbe production of certificates of stock. In all cases the certificates of stock shall be considered the bighest evidence of ownership.

Mining and Farming.

It has become almost a chronic condition of the press in agricultural distriots to nnderrate tbe benefits wbiob mining confers upon the community at large. We do not charge upon it any animus in so doing. It thoroughly understands all the facts and principles incident to farming, and though it may sometimes make slight errors in matters of detail, they are no more frequent than are similar errors in mining papers. If it really could comprehend the vast amount of labor which any large mine calls into activity, both directly and indirectly; if it could appreciate the fact, that tbe product of the gold and silver mines increases the metallic base of wbich the standards of value are composed; if it would duly consider that the miners consume no inconsiderable portion of the farm products, it would turn from its inadvertent error and give due credit to this valuable industry.

There is scarcely an industry extant whicb is not called upon to supply the wants of the miners; from the blacksmith at his anvil through all the ramifications of labor; from the one-horse cart with its limited means of transportation to the long train of beavily laden cars; from the rude flat-boat on the river to the well appointed steamer with its freightage capacity notated hy its tens of thousands of tons; from the laboratory to tbe more extensive manufacture of chemicals; from the muscular exertions of the individual to the powerful force of the most ponderous engine; from the limited garden to the farm with its multitude of acres, each and all of tbese cbannels of labor derive a portion of thoir support from the workers in the mines. But this item of benefit arising from mining, great as it really is, sinks into insignificance when compared witb the facilities whicb the mines afford to all of them for interchanging tbeir products through tbe medium of tbe precious metals whicb they yield. Were it not for coin as a standard of value, there could be no extensive oommercial or industrial pursuits maintained in vitality. The farmer could not dispose of the products of his farm and take in exchange the wares of tbe manufacturer, because his wants would not demand such an exchange. The railroad could not he constructed by paying its workmen in tickets for transportation; they would not ride enough in a year to pay for a month's wages. No branch of industry could sustain itself by making its employees receive the products of its work for tbeir labor. It is here wbere tbe advantages of mining are manifested, in that it affords a circulating medium—a standard of value—by wbicb all mercantile and commercial balances can be equitably adjusted and settled; and the interchange of commodities can be extended to the utmost limits.

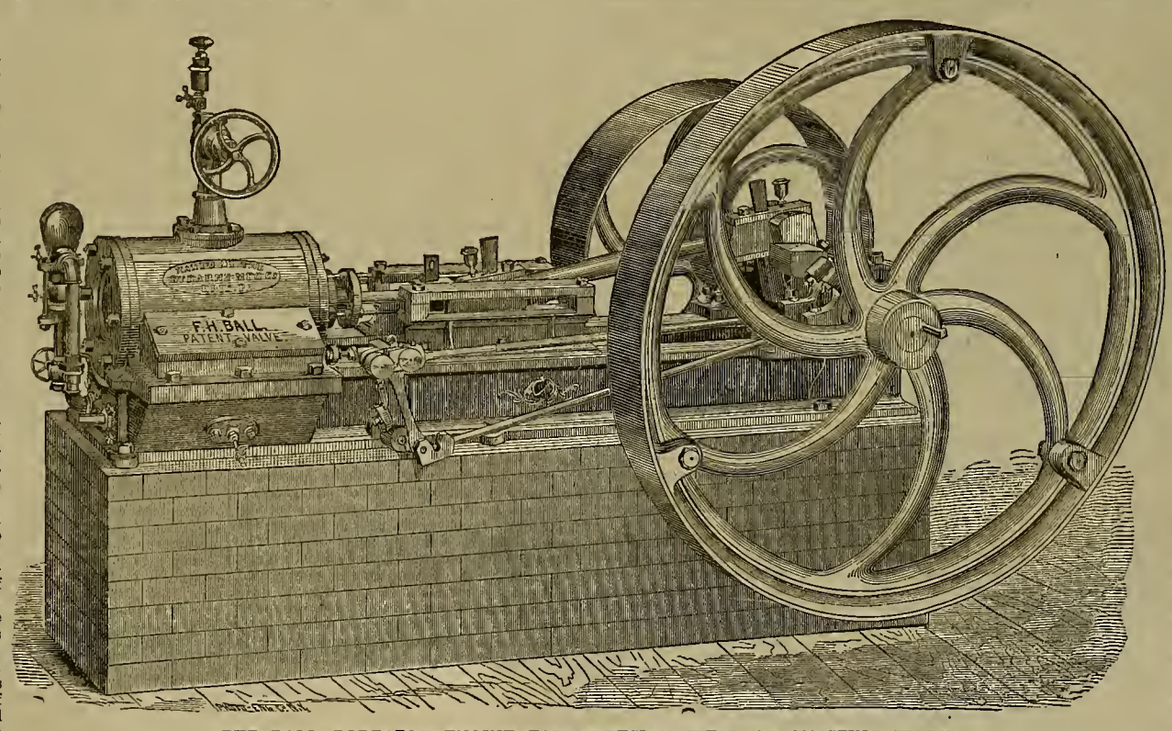
Nor are these other branches benefited by mining products only in the production of the coin-making metals. They actually owe tbeir gigantic proportions to the yield of tho mines. What would agriculture, transportation, manufactures, commerce, art, science, and, in short, every human industry now he, if the mines had never produced the one article of iron? What would bave been tbe condition of tbe buman race if this one metal had never been dug out of tbe earth hy the miner?

We do not wish to be understood as caviling at otbers for holding the mining industry in an unappreciated view. We merely desire to open their eyes to the utility which attends upon its exertions. We wish to convince them that were it not for the standard of value, and the other metals which the mines producc, there could not exist the wondrous civilization, with all its attendant elevating influences and ennobling qualities, that now confere its inestimable blessings upon mankind. We wish to draw their attention to the fact tbat tbeir own welfare is dependent upon tbe success of tbe mines, and that tbe mining interest should receive from all a genial recognition and a fostering care,

Ball's Portable Engine.

We illustrate borewitb one of F. H. Ball's patent portable engines, made hy the Stearns Manufacturing Company, for whicb Tatum & Bowen, 329 Market street, in tbis city, are agents. Tbe engine is especially adapted to drilling artesian or oil wells and for boisting, or any work where it is desirable to run an engine botb backward and forward and to bandle it from a distance.

The valves are held to tbeir seats by steam pressure, and made to follow their own wear, and are so constructed that there is no more pressure upon them tban is necessary to keep them steam tigbt, so tbat the engine can be reversed witb ease without shutting off tbe steam, wbich gives it all the advantages of a balanced valve, without tbe disadvantage of becoming leaky soon, wbicb is, and always has been the trouble with balance valves. The reversing gear is very simple and effective, and arranged for taking up the wear in every part. The balance wheel is made with special reference to the requirements of drilling artesian wells. It is in two parts, so that a light wheel can be used in starting a well, which is a great advantage, and as the work progresses and a heavier wheel becomes necessary, the other part can he attacbed. This facilitates drilling very much. The pillow blocks are furnished witb large oil reservoirs, and the babbit lining or boxes which form the bearings of the shaft are cast in a finished mold, so that tbey are interchangeable, and when worn out can be replaced witb new, which, when done, brings the sbaft into perfect line again. The shaft is very heavy and has long bearings. The engine is very heavy and strong all through, and is built for high speed and hard work, and will stand more neglect and abuse, and do well, than any engine ever offered to the public. Every nart of the engine is duplicated perfectly, from the cylinder or hed-plate to the smallest piece, so that it can he renewed when worn out, without any trouble or any machinist to put it together. During tbe last year over 200 of these engines have been sold in the Pennsylvania oil regions. They have recently been introduced on this coast as being specially adapted for certain kinds of work here.



THE BALL PORTABLE ENGINE FOR ARTESIAN WELL OR HOISTING WORK.

THE Western Union Telegraph Company has received advices from the New York office that, owing to the opening for business of the new French cable, a reduction of 62½ cents per word will he made in all cable messages from California to any portion of Europe outside of Great Britain and Ireland, to take effect on February 1st. No reduction in rates to Great Britain and Ireland will he made until tbe new Cable Company is prepared to compete tbere.

THE Board of Supervisors of San Francisco bave, by a vote of 7 to 5, determined to issue bonds to the extent of $1,500,000, for the purchase of Lake Merced.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Fresno County Mines.

EDITORS PRESS:—In the mining matters of Fresno county, there is no decrease in active work or prosperity, except such temporary cessation of work in the higher mountains as has been made necessary hy a severe wiuter and heavy enows.

The Kentucky Gravel Mining Company Has renewed its work near Millerton, under a new management, after eeveral months stoppage. They keep a force of eight men steadily employed. They are satisfied that they have not yet got hack to the bottom of the old river hed, in which their deep gravel deposits were made, hecause the dip, as they work hack from the prcsent river hank of tho San Joaquin, opposite Old Fort Miller, is still downward as they get farther from the river.

Hampton, Donahoo & Co., the present owners, recommenced their piping ahout Jauuary 1st, and results for tbe first two weeks are entirely eatisfactory.

The White Rock Mine,

In Fine Gold gulch, owned hy Hampton and Gault, of which some account was given in the MINING AND SCIENTIFIC PRESS last summer, has since August last heen developing occasional epots or "pockets" of reddish quartz, partly decomposed and quite rich in a pure free gold. Your correspondent has examined several specimens from euch pockets, and they are very eimilar to the rich rock of A. O. Bell's Life Preserver mine, near Auburn, Placer county, and answer very well the descriptions of the noted red cement claimed to have heen found years ago in Mono couuty.

In mortar prospects some of this finest rock has yielded at the rate of $800 per ton. Three cleanings have lately heen made from au arastra that is run by horse power. The reeults were good, averaging from $40 to $50 per ton. One of the latest and most promising mining enterprises in that district is

The Fine Gold Bedrock Fluming Company.

It is controlled by Hampton and Gault. Two years' work has already been done on it. The object of the undertaking is to drain some two miles of the hroad hed of Fine Gold Gulch creek that it may be thoroughly worked to hedrock. Already in digging the tail-race, which has heen completed ahout a mile and a half out of the two proposed, aud in the middle of the stream as a bedrock flume, fine nuggets of pure gold from 50 cents to $8 in value have heen found in cousiderahle quantities. In this work they go down from two to ten feet, the latter in "pot holes." These places are cleaned out hy diverting the stream for a time; the holes are afterwards allowed to refill. This enterprise embraces six claims and the company expect to complete the two miles of the tail-race this year. The whole hed of the stream will then he worked. A favorable sign is, that as the work proceeds, the results nearly pay expensee. Preparations at other points are heing vigorously made this winter to prese the prospecting aud development of the mining interests of Fresno county the coming summer, in the higher mountain rogions along the upper San Joaquin and King's river. I am reliably informed that the

Very Valuable Enterprise Mine,

Near Fresno Flats, is now heing worked with two arastras iustead of the one with which such excellent results were obtained last year. Its yield aud prospects continue as good as ever. It is claimed by some of the miners of this conuty that extensions of this very rich and peculiar ledge of gold quartz have been traced some 15 miles from the original ledge. It is also claimed that the "Lost Shipe mine" on King's river in this county, has heen re-discovered, and proves to he quite as rich as repreeented hy the traditions that tell of its first diseovery twelve years ago. J. W. A. W.

Borden, Jan. 19th.

UTAH DISTRICTS.—The Utah mining dietricts nnmher over eighty. They are found principally in a line from northeast to southwest throughout the Territory, or clustered near Salt Lake City. The location is accounted for by the fact that prospecting has followed the Mormon trails, if not on them, then parallel and contiguous thereto. I givo the names and locatione of the principal districts, with their distances from Salt Lake City: The Park, Big and Little Cottonwoods, American Fork and Snake Creek are all within a distance, east and southeast, of from 25 to 35 miles. Bingham Canyon is about 25 miles southwest; Camp Floyd, Ophir, Stocktou and Rush Valley are from 45 to 50 miles west and southwest. The Tintic district is in the valley of the same name, 75 miles to the southwest. To the south and eouthwest of Salt Lake City and the Union Pacific road lies Beaver county, from 200 to 250 miles distant. It contains Frisco, Star, Beaver Lake and Lincoln districts. Mt. Nebo district is 80 miles directly south. The Alta district is ahout the same distance. The Silver Reef is over 300 miles distant.—*Silver Reef Miner.*

A Review of the Modern Doctrine of Evolution.*

[By PROF. E. D. COPE.]

The doctrine of evolntion of organic types is sometimes appropriately called the doctrine of derivation, and its supporters, derivatists. This is hecause it teaches the derivation of species, genera and other divisions, from pre-existent ones, by a process of modification in ordinary descent by reproduction. The opposite or creativist doctrine teaches that these forms were created as we see them to-day, or nearly so; and that the natural divisions and species of organic heings have never been capahle of change, the one into the other.

I.—The Evidence for Evolution.

The reasons which induce me to accept the derivatist doctrine, and to reject the creational fall, under the two heads of probahilities and conclusive evidence. The probabilities are cumulative in their pointings, and form part of a hody of evidence which is to my mind conclusive. The reasons why derivation is prohahle are the euccessional relation of increment or decrement of structure, observed in:

1. Systematic biology (taxonomy); 2. embryonic growth (emhryology); 3. in geologic time (paleontology); 4. and in the coincidence in the successions seen in Nos. 1, 2, and 3.

The fact that it is necessary to arrange animals in an order corresponding with the phases of tbeir emhryonic history is remarkahle; but the further fact, shown by paleontology, that the same succession marked the ages of past time, at once hriugs evolution within the limits of strong prohability. Nevertheless, all this might have heen a mere system, without tranеitions hetween its memhere; organic types might have heen created unchangeable, but presenting the mutual relations in question. But if transitions among these memhers can be shown to take place, then indeed the phenomena mentioned receive a sufficient explanation. They are seen to be the necessary relations of the parts of a shifting scene of progression and retrogression; they express combiuations of structure, which, though often long enduring, are, uevertheless, not perpetual, hut give way to other comhinatious to he in their turn dissolved. Now, if there is anything well known in nature, it is that there are divisions of various ranks in the vegetahle and animal kingdoms, whose contents preseut variations of structure which are confessedly additions to or suhtractions from the characters of ancestors, which have appeared during ordinary descent. The protean species, genera, etc., are well known to biologists, and every naturalist who admits varieties, suh-epecies, eub-genera, etc., admits derivation so far as they are concerned. The facts of variation, including "sporting," etc., are notorious, not only among domesticated, hut also in wild animals and plants. The facts have led some persons to euggest that epecies have been produced hy evolution from a single specific center, but that the genns and other comprehensive divisions are nnchangeable. But I think I have ehown, in a paper entitled "The Origin of Genera,"† that the struetural characters which define genera, and even higher divisione, are suhjects of variation, to as great an extent as are the less profound specific characters; and, moreover, that the evidence of derivation which they present is singularly clear and conclusive. The cbanges of hoth genus and species character are always of the nature of additions to or suhtractions from those of one generation, displayed hy their descendants. As euch, they form the closing chaptere of the emhryonic or growth-history of the later generation.

In order to explain more fully the application of the ahove statements, I introduce a few examples selected from the eubjects of my studies. Their number might he indefinitely extended. I first cite the genera of the tailless *Batrachia* (*anura;* frogs, toads, etc.), whose relations are very simple and clear, and show the parallelism between adnlt structure and emhryonic succession. See above, 1 and 2.

The greater number of *Batrachia anura* fall into two divisions, which differ only in the etructure of the lower portion of their scapular arch, or shoulder-girdle. In the one the opposite halves are capahle of movements which contract or expand the capacity of the thorax; in the other the opposite halves ahut against each other, so as to he incapahle of movemcnt, thus preserving the size of the thoracic cavity. But during the early stages, the frogs of this division have the movahle shoulder-girdle which characterizes those of the other division, the consolidation constituting a modification superadded in attaining maturity. Furthermore, young *anura* are toothless, and one section of the species with emhryonic shoulder-girdle, never acquire teeth. So here we have a group which is imperfect in two points instead of one. This is the tribe *Bufoniformia;* the trihe with teeth and emhryonic shoulder-girdle is called the *Arcifera*, and that which is advanced in both these respects is the *Raniformia*. Now the frogs of each of these divisions present a nearly similar scale of development of another part of the ekeleton, viz., the hones of the top of the skull. We find some in which one of these bones (ethmoid) is represented hy cartilage only, and the fronto-parietals and nasals are represented hy only a narrow strip of hone each. In the next type the ethmoid is ossified; in the next, we have either tbe fronto-parietal or nasal only eompletely ossified, usually the former; in the third form, hoth hones are completed. In the fourth station on the line, these hones are rough, with a hyperostosis of their surfaces; aud in the next set of speciea, this ossification fills the skin, which is thus no longer separahle from the cranial bones. In the last and seventh form, the ossification is extended so as to roof in the temporal muscles and enclose the orhits hehind. Now all of these types are not found in all of the families of the *Anura*, but the greater number of tbem are. Five principal families, three of which belong to the *Arcifera*, are named in the diagram below. I do not give tho names of the genera which are defined as ahove described, referring to puhlished systematic works for them, hut indicate them by the numbers on the margin of the page, whicb correspond to those of the definitione ahove given. A zero mark signifies the absence or non-discovery of generic type.

	Sternum embryonic.				Sternum complete.
	Bufoniformia.	Arcifera.			Raniformia.
	Bufonidæ.	Scaphiopidæ.	Cystignathidæ.	Hylidæ.	Ranidæ.
1—	0	0	1	1	0
2—	2	2	2	2	0
3—	3	0	3	0	3
4—	4	4	4	4	4
5—	5	5	0	5	5
6—	6	6	6	6	6
7—	7	7	7	7	0

It is evident, from what has preceded, that a perfecting of the shoulder-girdle in any of the species of the Bufoniform and Arciferous columns, would place it in the series of *Raniformia*. An accession of teeth in a species of the division *Bufoniformia*, would make it one of the *Arcifera;* while a small amount of change in the ossification of the hones of the skull would transfer a epecies from one to another of the generic stations represented hy the numhers of the columns from one to seven.

There are few groupe where this law of parallelism ie so readily observed among cotemporary types as in the *Batrachia*, hut it is none the less universal. The kind of parallelism usually observed is that in which there is only a partial resemhlauce hetween adults of certain animals aud the young of others. This has been termed "inexact parallelism," and the relation presented hy forms not very nearly phylogenetically related. The more remote the phylogenetic lines of two types, the more "inexact" will their parallelism he. It was once a question whether any parallelism could be traced hetween the members of the primary divisions of animals, and in my essay on the "Origin of Genera," I was compelled to state that there was then "no evidence of the community of origin of these divisions." Since that time, Haeckel has puhlished his "Gastræa Theory." This is a grand generalization from the facts of emhryology, which shows the community in type of the early stages of all animals, and the similarity of the phasee which they present during a part of their larval life.

The paleontology of the *Batrachia anura* is largely unknown, eo we must look elsewhere for proof of the truth of the fourth proposition, viz., that the successional relation in emhryology corresponds with that shown by paleontology to have existed in geologic time.

For this purpose I select one of the most complete series known to paleontology; that of the camels or *Camelidæ*, whose remains are found ahundantly in various parts of our country. The snccession of the known genera is seen in the structure of the bones of the feet, of the superior incisor, and premolar teeth. The metatarsal and metacarpal hones are or are not co-ossified into a cannon hone; the first and second superior incisor teeth are present, rudimental or wanting, and the premolars nnmher from four to one, The relation which these conditions hear to geologic time is displayed in the following table, commencing with the lowest horizon:

	No cannon bone.		Cannon bone present.	
	Incisor teeth present.		Incisors 1 & 2 wanting.	
	Four premolars.	3 prem'ls.	2 prem'ls.	1 prem'ls.
Lower Miocene.	*Poebrotherium.*			
Upper Miocene.	*Protolabis.*		*Procamelus.*	*Pliauchenia.*
Pliocene and Recent.			*Camelus.*	*Auchenia.*

This table shows that geological time has witnessed, in the history of the *Camelidæ*, the consolidation of the hones of the feet and a great reduction in the numhere of the incisor and premolar teeth. The emhryonic history of these parts is as follows: In the fœtal state all the *ruminantia* (to which the camels helong) have the cannon hones divided as in *Poebrotherium;* they exhihit also incisor teeth, ae in that genus and *Protolabis*. Very yonng camels have the additional premolar of *Pliauchenia*. They shed this tooth at an early period, hut very rarely a camel is found in which the tooth persists. The anterior premolar of the normal *Camelus* is in like manner found in the young lama (*Auchenia*), hut is shed long before the animal attains maturity. I may add that in some specimens of *Procamelus* caducous scales of enamel and dentine in shallow cavities represent the incisive dentition of *Protolabis*.

It remains to show that characters of the kind above mentioned are sometimes inconstant; tbat they may or may not appear in individuals of a species. Under such circumstances it is evident that their origin does not imply any break in the line of descent.

First, as to a family character. It is well known that the deer differ from the giraffes in the presence of a hurr or ring of osseous excrescences surrounding the hase of the horn. Now in the extinct tertiary genus *Procervulus* there are three species which possess or lack this burr indifferently. Why some individuals should, and others should not possese it, ie not kuown.

Second, as to a generic character. The genus *Canis* (dog) is defined hy the presence of two tuhercular morlars in the inferior series. The allied genus, *Thous*, possesses three euch teeth, while *Icticyon* has hut one. Now examples of *Canis familiaris* (domestic dog) with hut one tuhercular molar are not rare, while an individual with three is occasionally found.

To take another case. The normal dentition of *Homo* (man) is, on each side, incisors, 2; canine, 1; premolars, 2; molars, 3. It is very common to find in the higher races, individuals who have molars only two in one or both jaws; and the absence of the external incisors of the upper jaw is almost as frequently met with. Here we have two new generic variations in one and the eame species.

In specific charactere variations are most familiar. Thus, the young of deer are generally spotted, and the adults are nearly uniform in coloration. Some deer (as the *Axis*) retain the spotted coloration throughout life, while au occasional spotted individual of unicolor species, is a violation of specific character by a failure to develop. The larvæ of some salamanders are of uniform coloration, and the adults spotted. The unicolor adults of tbe same species, not uncommonly met with, present examples of the same kind of variation.

Any biologist can select hundreds of similar cases from his epecial department of study.

II.—The Laws of Evolution.

Having reviewed the reasons why the doctrine of evolution should he received as truth, I desire to give atteution to the lawe which may be made out hy reference to its phenomena. Progress in this direction is difficult, owing to the natural impediments in the way of studying the history of the growth of living heings. We will, however, commence hy examining more fully the phenomona with which we have to deal.

It is well understood that the world of animal life is a uicely adjusted equilihrium, maintained between each individual and its environment. This environment consists of hoth purely physical forces and those exercised hy other animals. Animals antagonize each other in procuring food, whether that food consist of vegetation or of other animals, hut in the latter case the conflict is more severe. A similar competition exists among male animals in the matter of reproduction. These exhibitions of energy constitute tbe struggle for existence, which is the daily husiness of the living world. It is well understood, that in this struggle the individuals best provided with means of self-preservation necessarily survive, while the weak in resources must disappear from the ecene. Hence those which survive must display some especial fitness for existence under the circumstances of their environment, whatever they may he. So the "survival of the fittest" is helieved to he a law of evolution, and the proccss hy which it is brought ahout has been termed "natural selection."‡ The works of Darwin and others have satisfied biologists that this is a *vera causa*.

Before the excellence of a machine can he tested, it muet exist, aud hefore man or nature selects the best, there must he at least two to choose from as alternatives. Furthermore it ie exceedingly improhable that the nicely adapted machinery of animals should have come into existence without the operation of causes leading directly to that end. The doctrines of "selection" and "snrvival" plainly do not reach the kernel of evolution, which is, as I have long since pointed out, the question of "the origin of the fittest." The omission of this problem from the discussion of evolution, is to leave Hamlet out of the play to which he has given the name. The law by which structures originate is one thing; those hy which they are restricted, directed, or destroyed, is another thing.

There are two kinds of evolution, progressive and retrogressive; or, to use expressions more free from objection, hy addition of parts and hy suhtraction of parts. It is further evident that that animal which adds something to ite structure which its parents did not possess, has grown more than they; while that which does not attain to all the characteristics of its ancestors has grown less than they. To express the change in the growth-history which constitutes the beginning of evolution, I have employed the terms "acceleration and retardation." Generally these expressions are literally exact, *i.* e., there is an increased rate of growth in evolution hy addition, and a decreascd ratc in evolution by subtraction; hut this is not always the case, for some divisions of animals have increased the length of their growth-period without reference to evolution in structure. The terms express the phenomena figuratively, where not exact in the sense of time, and I believe they are sufficiently clear. The origin of the fittest is then a result of either accelcration or retardation. It is easy to perceive that a character which makes its appearance in a parent hefore or near to the hreeding season is likely to he transmitted to its descendants; so also a character which is lost near

CONTINUED ON PAGE 70.

*Abstract of a lecture delivered before the California Academy of Sciences, Oct. 27th, 1879.

† Philadelphia, 1869; "Proceedings Academy Natural Science, 1868."

MECHANICAL PROGRESS.

The Steel Age.

Every day steel is supplanting iron for some one of the numerous purposes to which that metal has hitherto been applied. Iron rails are alrsady replaced, or soon will bs, by steel rails on svery considorable railwsy in tho land. In a paper read before the Iron and Steel Iostitute, it was stated that many of tho British lines could not have paid more thau half the dividenda they now make if it had not been fer the development of steel rails and steal tires. The opiuion is gaiuing ground among ahipbuilders that a framework of ateel for vessels would be superior to iron, being a lightor material in proportion to its atreugth. It is evidcnt that tho coming century is to ho an age of stcel. Upon the perfection of that metal, and its adaptability to the various usea to which it may be put, the safcty of tho modern traveler must largely depend. And whether he is rushing ever the surface of the earth on an cxpress train at the ratc of 50 miles an hour, or driving 350 miles a day through the ocean on a transatlantic steamer, he wants to rest assured that scienco has dono all it can to make his journey safe.

The abovo remarks were suggested by the opinion expressed recently at the Iron and Steel Institutc in Liverpool, that the tests reqnired at present for steel were too stringent and severe. But it was answered that the traveler would not feel as safe as he does were the tests of steel diminished in severity. Criticism was chiefly directed to the tests applied by the Lloyds and the Admiralty to steel used in shipbuilding only; but it is probable that if stringency is relaxed in one direction, it will be in all. The argument was that although steel makes a better framework for ahips than iron, it will not he employed at present, becauso it mnst undergo tests proportionately mucli more severe than those to whieh iron is subjected. In other words, the mannfacturers, or some of them, contend that under much lighter tests than those now required, steel framework would be quite as strong as the iron framework which the authorities constantly approve. But this may be an argument against the suffieiency of the iron tests, rather than against the stringency of the steel tests.

Whether it is or not, however, Dr. Siemens, than whom no man ought to be more competent to speak on the aubject, pointed out a difference between iron and steel which appears to justify the maintenance of the severest tests. Iron, he said, always holds together, except when fractured hy a blow under peeuliar circumstances; its tendency is to hold together when struck or strained, whether it is of good or poor quality. But this is not the case with all steol. The hest steel, it is trus, will bend like leather rather than break, but anything inferior to that quality is far more liable to disastrous fracture than iron. Hence, said Dr. Siemens, do not diminish the tests of steel, bnt rather increase their severity.

Practically, this positive expression of opinion from so high an authority settles the question for the time heing. We do not mean that there was no dissension from the views of Dr. Siemens, hut none of the steel tests under consideration are likely to be relaxed in opposition to his emphatic advice. As the maintenance of a high standard of excellence in Great Britain is conducive to the maintenance of a like standard in this country, we regard this result with content.—*Manufacturer and Builder.*

Manufacture of Iron and Steel.

In working those gradea of iron and steel which are reduced to a fluid condition in being converted directly or indirectly from pig-iron, Mr. E. Whceler, of Philadelphia, proposes to nse a malleahle metal casing of a shape adapted to the form of product required. The thicknesa of material of which the mold is made must be determined largely by the nature of the product. In any case the material must he strong enough, and the joints, aogles, or corners of the mold must he tight enough to retain the molten contents, not only when they are poured into the mold, but also during subsequent treatment or working. One end or side of the mold should be made removable for the purpose of filling, or in lieu thereof a snitable opening should be made in one of the sides or ends of the mold. If a product is required having substantially a uniform quality throughout, the mold is filled with the desired metal while the latter is in a molten condition by pouring or in any other convenient way. It is not essential that the mold be filled at one pouring, or while all the contents of the mold are molten, the metal, for instance, may he poured in from time to time, until the desired quantity is obtained.

If it is desired to mix a certain proportion of iron or steel, whether fibrous or cast with homogeneous metal, it may be first arranged in the mold as desired, and molten metal poured in so as to fill the interstices between the solid portions and complete the filling of the mold to the extent desired, or the mold may be partially filled with metal of one grade, and metal of another grade be subsequently added, thus forming an ingot in which different gradcs of metal are arranged either miscellaneoosly or rsgularly in separate layers or divisions, tho arrangement depending upon the charscter of the product required. When thus filled, ths opening in tho mold is closed by any suitable cap, cover, or stopper, the latter being sscured by riveting, welding, banding, or otherwise, so as to confine the contents of the mold during subsequent working. The meld and contents are then placed in a suitable heating furnscs and raised to such temperature that the homogenssons or cast portion of tho contents shall be eithor in whols or in part in s ststo of fusion or semi-fusion. This can readily hs dons without destroying the form or shape of the mnld or casing, since the degrco of hcat at which wrought-iron fusea or becomes liquid is much higher than that at which homogoneous irou fuses, and still higher than that at which steel fuses. In the operation tho mold or casing operates substantially as a cruciblo, retsining the contsnts and excluding tho air.—*Coal Trade Journal.*

Monster Steamers.

It seems that the Central Pacific ferry steamer *Solano*, now the largest ferry boat in the world, is about to be eclipsed by an English ferry boat which will soon be constructed for crossing tho British channel. The *Solano* is but 424 feet in length, while the English boat is to bo 650 feet long. The breadth of beam of the *Solano* is 116 feet, while that of the English boat is to he 150. The English hoat will be used like the *Solano*, for transporting railroad trains, and will be propelled by a number of paddles and screws, and will form a connection with the railroads running from the coasts to London and Paris. A movable platform on an incline will connect the ferry and the shore rails. This monster will be as long as the *Great Eastern*, and more than twice her width.

The managers of the Inman line of steamers are also building a monster steamer to run between New York and Liverpool. She will be known as the *City of Rome*. Her dimensions are to bc as follows: Length of keel, 546 feet; length over all, 590 feet; breadth of beam, 52 feet; depth of hold, 38 feet 9 inches, and depth from top of deck-houses to keel, 52 feet. Her measurement will he 8,300 tons, or over 2,000 tons larger than either the *City of Berlin* or the *Arizona*. She will be over four-fifths of the size of the *Great Eastern*. The enginea will he of 8,500 horse power, with six cylinders, three of which are high-pressure and three low-pressure. There will ho eight boilers, heated by 48 furnaces, and the vessel can be propelled at a rate of 18½ knots an hour. She will carry four large masts and three smoke funnels. A large spread of canvas can he set, which will enable the steamship to make good time, if necssary without the aid of the engines. She will be built of steel, with a double bottom, and eleven bulkheads. Two longitudinal hulkheads are to he run through the engines' and boilers' space. These will greatly decrease the danger of the vessel sinking in case of a collision. The top decks are to be of the hest teak. No expense is to be spared in making this magnificent steamship perfect in every respect. She will have the highest classification of any vessel in the Liverpool Red-book and in the British Lloyds. The Inman people expect that the *City of Rome* will prove the monarch of the seas.

Phosphorus Needed in White Pig Iron.—The *Journal de Liege* publishes the following remarkahle statement as to experiments being made in the Horde Works in Germany: Instead of blowing gray pig rich in silicon, it was found possible to treat white pig, if it contained a sufficient amount of phosphorus. Far from being afraid of phosphorus, some 2% of that body is required in the pig, in order to give a sufficient degree of heat to the bath. Horde has begun to make ferrophosphide with 20% of phosphorus, and will presently make this alloy to contain 50% phosphorus. This will be sold to mix with white pig, since the crude metal must contain phosphorus or silicon enough to carry up the hath to the heat required. At Horde all sorts of pig, even cinder pig, with 3% phosphorus and 0.5% silicon, were treated. The presence of 0.2% to 0.3% sulphur could also, it was found, be tolerated. The steel made contained under 0.1 phosphorus and no silicon. On Decemher 1st, experiments of a character recognized as decisive were carried out before a party of ironmasters assembled to watch the operations.

Oxidation of Iron and Steel when in Contact.—Mr. G. Radcliffe, in a paper read before the Iron and Steel Institute of Great Britain, incideutally mentioned a case in which steel boiler plates, which had been exposed to the same conditions as adjacent iron plates, had distinguished themselves by pitting more than the latter. The steel plate next to the iron one was oxidized considerably more than any other. This fact would appear to point to a species of galvanic action set up by the contact of the two varieties of metal in an exciting liquid, the steel playing the part of the positive element. Mr. Radcliffe does not attempt, however, to offer an explanation, hut simply concludes that, under the above-named circumstances, it will not do to place iron and steel side by side.

Straightening Hardened Steel.—In hardening and tempering tools they sometimes spring, to the great annoyance of the workmen, and not seldom the tool is reheated and rehardened. In most cases this may be avoided. To straightsn a piecs of steel already hardened snd tempered, heat it lightly, not enough to drsw the temper, and it may be straightened hy hlows from a hammer, if the charscter of the tool will admit of such treatment, or, as in case of a tap, it may be straightened hy a hcavy mallet on a bard wood block. Although ths steel when cold would break like glass with this treatment, when slightly warmed it will yield to moderatsly heavy hlows uniojured.

SCIENTIFIC PROGRESS.

The Desert of Sahara.

Much attention is now being sttracted to the great African desert, Sahara; not altogether through more motives of curiosity, but chiefly in the interest of science, and with the view to flooding somo portions of that region and bringing others into more favorable conditions for cultivation. Two plans for flooding have been suggestsd, one to let in the waters of the Mediterranean and make a sea of the lower portions; the other is a more gradual but eqnally sure and more serviceable mode of improvement, by which fresh water may spread its fertilizing influence over a large portion of those now drear and arid plains.

It is well known that even within historic times, Sahara has been a comparatively fertile and popnlous region. Its ancient fertility was not derived from rivers, but from wells, "spouting wells," they were called then, which from disuse or other cause have long since ceased to flow. So that the very existence or even possibility of such wells, anywhere, had been almost or quite forgotten until within a few years, when similar wells, now known as artesian, were found in the Valley of the Seine, from whence their knowledge and use has apread over almost the whole civilized world.

That artesian wells once existed among the oases of the Sahara desert is known from what is said of this region by ancient writsrs. References in this direction are given by Lieut. Schroeder, U. S. N., in a paper in the last number of the *Popular Science Monthly*, from which we condense a few paragraphs:

Diodoras, a priest of Tarsus, 1,600 years ago spoke of the great oasis, 40 leagues from the Egyptian frontier, which he said was irrigated, not hy rains or rivers, hut by springs which issue continually from the ground,—not spontaneously, but by great labor on the part of the inhabitants—meaning, of course, artesian wells, bored or in aome way sunk by man. Some of these old wells have been discovered within a few years, and found filled with stone valves, by which their flow could be regnlated. Some of these wells are spoken of by other ancient writers as being 500 cubits deep. How they were dug will probably ever remain a mystery. Several Arabian writers spoke of them over 1,000 years ago, as then flowing. Ibn Khaldoun referred to them as "spouting wells," and coosidered them a miraculous fact. Their origin had even then been lost. Modern research has disclosed the sources of supply of these artesian waters, which atill exists in numerous localities all along the eastern and northern borders of that great desert region.

Although our knowledge of its geology and hydrography is as yet quite meager, enongh is known to determine that immense subterranean sheets of water may he found in many places at a comparatively small depth from the surface; and it is quite certain that if an enterprising and energetic people were planted upon the hordera of this desert, in place of the bigoted, lazy Saharan tribes who now roam upon them, the desert would soon again become clothed with verdure, and be made a most productive country. It is a curious but well attested fact that many ancient wells have been filled up hy the more recent dwellers, evidently either for the purpose of defence against warlike invasion, or with the view of discouraging the influx of a more energetic and industriona class of people than themselves.

The French have already commenced a system of improvement in the desert back of Algiers. The first artesian well was struck as long ago as June, 1856. Within the next eight years seventy-two successful borings had been completed, the deepest of which is only 364 feet. The supply of water is exceedingly abundant, and of most excellent quality.

Origin of the Desert.

The writer, above alluded to, also gives the following as a possible hint at what may have greatly aided in the change which has converted this once prosperous and comparatively fertile region to its present sterile character:

A M. Largeau in 1874 visited the Valley of the Igharghar, with the intention of branching off to Rhadames to study the commerce of that oasis and test the practicability of diverting to Algeria the caravans that come there by the central routs from Soodan. He questioned the *chambas* on the causes of the drying of the great Saharan streams, and found that all agreed in saying that these dead rivers once ran full through a country more fertile than the Tell (the region north of the Atlas mountain's crest), but conld only explain it by legends more interesting than satisfactory.

M. Largeau gives the following explanation of the change: "It is knewn that pastoral people have always been great destroyers of forests, for they need large spaces of clear ground to feed the flocks that form their wealth and to promote security against the wild beasts that lurk in forests. Evsn now the Algerian Arabs srs sesn firiog the woods to enlargs the narrow limits imposed upon thsm by colonizstion. So, although the great Saharan strssms have not bean explored to their sources, yet it is known that they commence on the bare plateaux that are but the skeletons of hights once wooded and fertile. All accounts of the inhabitants of these regions agree on that point. Consequsnt upon the destruction of the forests the periodical rains were replsced by rare snd short though violent storms, the waters from which, instead of soaking in as in past ages, slip by on the rocky masses, carrying away the rich surface mold, and bring about the drying of the springs, and, as a direct consequence, of tho rivers."

A New Bleaching Process.

A new process of bleaching by means of nascent oxygen (ozone), which promises to effect great changes, especially in the employment of chloride of lime, has been discovered by a French chemist, M. Dienheim Brochocki, of Paris. In bleaching with chlorine in the ordinary manner the material to he treated is brought into direct contact with the bleaching agent, whether it consists of dry chlorine gas, or of an aqueous solution of hypochlorite of lime. In the former process the chlorine destroys the coloring matter by combining with its hydrogen, forming hydrochloric acid, which, as fast as it is formed, acts destructively upon the ligneous matter, and the mass cannot he entirely bleached without being destroyed to a great extent.

In the other case the hypochlorous acid of the chloride of lime is too intimately combined with its base to have any great tendency to combine with the hydrogen of the coloring matter, and it is only hy the addition of an acid, which displaces it from its base, that it is rendered active. The result is a loss in hypochlorous acid which escapes from the mass, an immediate injurious effect upon the fiber caused by the acid added, and a more or less slow destructive action due to the lime, which becomes incrusted in the pores of the fibers in the form of insoluble salts, incapable of being entirely removed by washing. A new compound, "chlorozone," it is claimed, obviates these objections. The chlorozone may he acid or alkaline, liquid or solid. It is in either case obtained in the cold by saturating a caustic alkaline lye by a current of hypochlorous acid in conjunction with a current of air.

The rationale of its action may be thus explained: Chlorozone being a compound of soda and a loose chloric acid, with an excess of caustic soda in the solution, when the cloth is put into the bath the chloric acid is broken up, the oxygen combining with the hydrogen of the coloring matter to form water, while the liberated atom of chlorine is taken up by the free caustic soda, and forms chloride of sodium, or common salt, setting free in its turn another atom of the hydrogen in the coloring matter. These compounds all being soluble, are held in solution in excess of the water present. The oxygen set free being in a nascent condition (ozone), is one of the most powerful bleaching agents known.—*Paper World.*

Refinement in Experiments with Falling Bodies.—Waldron, of Strasburg, has invented several new methods of demonstrating practically the laws to which falling bodies are subject. One of his instruments consists of a small metallic hall suspended by a string and under it, at a distance which we will call 1, are a pair of metallic balls connected with the poles of an electric machine, and so far apart that no spark can pass, but so near that when the suspended ball falls between them a spark will pass. Directly under this are several other pairs, similarly arranged, at distance of 3, 5, 7, etc., all connected with the electric machine and in the same circuit. When the thread of the suspended ball is burned, the ball falls between the others under it, giving passage, at each pair to the current; and a simultaneous spark in another part of the circuit makes a mark for each pair of balls, on a revolving blackened cylinder or disk. The intervals between the marks are found to be equal, which proves that when the time occupied by a falling body is divided into equal periods, it falls during the first period 1 distance, during the second it will pass over 3, during the third 5, and during the fourth period 7 such distances.

The Passivity of Iron.—M. Louis Varenne recently examined the passivity of iron when employed as the positive pole of a nitric acid battery, or as positive electrode of a voltameter cell containing nitric acid, and concludes that the passive state is due to a film of nitric peroxide which collects upon the surface of the iron and protects it from further chemical action. M. Varenne states that this film is apparent when the surface is examined under the microscope. He finds that the passive state ceases if a stream of carbonic dioxide or of hydrogen is passed through the liquid, and that solution proceeds apace. He also finds that nitric peroxide gas is evolved from the passive iron when it is placed in vacuo.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 8.	Week Ending Jan. 15	Week Ending Jan. 22	Week Ending Jan. 29.
Alpha	11⅛ 10	11½ 10	12 10¼	10¼ 10¼
Alta	4¼ 2.95	4.05 4¼	5¼ 4.35	4.35 4.20
Andes	1 45c	80c 60c	1¼ 75c	1.30 90c
Alps				
Argenta	1.55 1.30	1⅜ 1.40	1½ 1⅜	1½ 1.10
Atlantic				
Aurora Tunnel				
Baltimore Con				
Belcher	68 41	10¼ 52	132 9	123 10½
Belmont	1 70c	75c 65c	75c 60c	60c 40c
Best & Belcher	14½ 10⅝	13⅜ 13	14½ 13⅛	13½ 11⅛
Bullion	5 3.80	5 4.40	6¼ 5⅜	5¼ 4.80
Bechtel	1⅛ 1⅛	1.85 1.55	2 1.65	2 1¼
Belle Isle	1.55 1⅛	1.80 1⅛	1.90 1.60	1.70 1.20
Bodie	9 8¼	8¼ 8¼	7 9	8
Benton	2.90 1.65	2.80 2.35	3¼ 2.40	2.80 2.10
Bulwer	9¼ 9¼	13 9¼	12 10	11 10¼
Boyle				
Black Hawk	1 45c	85c 60c	1 75c	75c 70c
Belvidero	1 80c	1 75c	1¼ 95c	1.10 95c
Booker	50c 35c	50c 40c	65c 45c	50c 40c
Caledonia	1⅞ 1.45	1½ 2	1.60 2	1.35
California	4.40 3.95	4.40 4¼	4.40 4.05	4 3.70
Challenge	2.10 1.80	2.05 1.90	2¼ 2	2.30 1.90
Chollar	8 6	9¼ 7¼	9¼ 8	9 8¼
Confidence	3¼ 7⅛	8¼ 8	9 8¾	9 8¼
Con Imperial	65c 45c	90c 55c	1 85c	83c 75c
Con Virginia	5 4	4.60 4½	4.90 4.05	4½ 3.80
Crown Point	4¼ 3.15	5⅝ 3.30	6¼ 5	5¼ 5
Con Washoe		25c	30c	25c
Champion	20c 10c	20c 10c	50c 25c	60c 25c
Concordia	50c 25c			
Dayton				
DeFrees				
Daney				
Day	70c 55c	75c 65c	75c 65c	70c 30c
Eureka Con	16⅞ 16¼	18 16½	16½ 15¼	17 16
Exchequer	3¼ 2.90	3.80 3.10	4.20 3¼	3.70 3
Endowment	40c 35c	50c 35c	60c 45c	40c 30c
Gen Thomas				
Grand Prize	1⅛ 1.15	1.70 1⅛	1.55 1.40	1.70 1.55
Gila	10c	15c 5c	15c 10c	10c 5c
Golden Chariot				
Golden Terra	11 10¼	10½ 9	10½	10¼ 10
Goodshaw	35c 15c	50c 35c	40c	40c 35c
Gould & Curry	7 5⅜	6⅝ 5¼	7 6¼	6¼ 5⅛
Hale & Norcross	9¼ 6¼	9 8¼	8¾ 8¼	8¼ 7¼
Hillside	1⅛ 1.40	2.05 1⅛	1½	1.65 1⅛
Highbridge				
Homestake				
Hussey				
Independence	1⅛ 1	1.10 75c	90c 75c	90c
Julia	2.60 1.95	2.55 2¼	2¾ 2.55	2.30 2
Justice	2.60 1⅛	2¼ 2	3.40 2½	2.30 2
Jackson	3¼	3½		
Joe Sextes				
K K Con		5	4½	
Kentuck	4¼ 3.30	4.10 3.30	4.20 3.90	4 3½
Kossuth				
Keystone				
Lady Bryan	30c 15c	1.45 40c	3¼ 25c	60c 5c
Lady Wash	85c 50c	75c 65c	1.15 80c	1 75c
Leopard	10c	10c	20c 15c	25c 20c
Leviathan	40c 30c	40c 30c	50c 40c	35c 15c
Leeds	50c	80c 60c	75c 50c	50c 40c
Lee				
May Belle	15c 10c	30c 20c	40c 20c	25c 20c
Modoc				
Manhattan	1.80 1⅛	2 1⅛	1.90 1⅛	1⅛ 1¼
Martin White	75c 60c	1.40 45c	1.40 1⅛	1.10 1
McClinton	50c 40c	1 50c	75c 65c	65c 50c
Meadow Valley				
Mexican	22½ 17½	21¼ 19½	19½ 17½	19½ 18½
Mides				
Morning Star		2½		
North Con Virginia				
New York	50c 30c	50c 30c	75c 45c	50c 35c
Northern Belle	8 6½	10¼ 9¼	9¼ 9	10¼ 9¼
New Coso				
Navajo	75c 25c	40c 35c	40c 35c	40c 35c
Occidental	1.60 1	2.05 1⅜	2 1⅛	1.30 1
Ophir	21½ 19¼	21 19½	20 17¼	19¼ 18½
Oriental	1 15c	80c 55c	90c 70c	55c 50c
Overman	8¾ 7	9¼ 7⅞	10 8¼	8¾ 7⅞
Panther				
Phenix				1⅞
Phil Sheridan				
Potosi	4¼ 3	5⅝ 4	5½ 4.90	5¼ 4.90
Prospect				
Raymond & Ely	1 90c	1 95c	1 80c	1 80c
Richer				
Rock Island				
Rye Patch				
Rough & Ready				
Savage	7⅞ 5⅞	7¼ 6¼	8 7⅞	7¼ 6¾
Seg Belcher	19 15	23½ 16	25 21	21 19
Sierra Nevada	27 18¼	22½ 20¼	24 20¼	23 21¼
Silver Hill	1 75c	90c 75c	2 95c	90c 60c
Silver King	7¼ 7	7 6¼	7¼ 6¾	7 6½
Silver Prize				
Succor				
Summit	1⅛ 80c	1¼ 1	1.40 1	1.20 1
Scorpion	4.15 2.85	3.30 3.20	3.95 3.40	3.60 3.20
Solid Silver			50c 20c	50c 30c
South Bodie	25c 20c	20c 15c	25c 15c	25c 20c
South Standard				
Star	10c 5c	25c 15c	30c 20c	35c 30c
St. Louis			50c 15c	25c
Syndicate	1⅛ 1	1⅛ 1	2 1⅜	1⅜ 1¼
Tioga Con	2½ 2	3.35 2.45	3.40 2.90	3 2.85
Tiptop	3 2	4 3¼	3¼ 3	3¼ 3.55
Trojan				50c 30c
Union Con	60 40½	51½ 45¼	47 44	49 42½
Valley	13¼ 9½	12⅜ 11¼	17⅜ 12⅜	18 15½
Vermont Con				
Ward	1¼ 1	2¼ 1.40	2.85 2.40	2¼ 1.60
Wells Fargo	10c	10c	15c 10c	15c 10c
Woodville				
White Cloud				
Yellow Jacket	12¼ 9⅜	11⅜ 10¼	13¼ 10⅞	12⅜ 11

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 23.

90	Utah	670	Ward
70	Alpha	265	Yellow Jacket
605	Andes		AFTERNOON SESSION.
95	Benton	2670	Argenta
685	Belcher	100	Addenda
455	Bullion	700	Atlas
110	Best & Belcher	700	Albion
250	California	300	Belle Isle
200	Con Virginia	1050	Belmont
395	Chollar	250	Belvidere
90	Confidence	140	Black Hawk
100	Cosmopolitan	150	Booker
770	Con Imperial	165	Bodie
700	Crown Point	350	Bechtel
240	Caledonia	1405	Channion
50	El Dorado	200	C Pacific
1125	Challenge	450	Dudley
50	Dardanelles	750	Endowment
590	Exchequer	35	Eureka Con
450	Flowery	150	Golden Terra
340	Golden Gate	230	Grand Prize
295	Gould & Curry	150	Independence
160	Hale & Nor	235	Jupiter
730	Julia	200	Leopard
340	Justice	200	Leeds
170	Kentuck	300	Mono
3020	L Bryan	500	Manhattan
100	Leviathan	50	May Belle
650	Lady Wash	95	Mammoth
495	Mexican	445	McClinton
1400	Mackey	1570	Metallic
890	N Bonanza	70	Mt Diablo
490	New York	125	Noonday
50	Occidental	400	Navajo
65	Overman	100	N Noonday
465	Ophir	270	Northern Belle
125	Potosi	1700	Oriental
185	Savage	100	Phenix
230	Scorpion	1275	Queen Bee
430	Silver Hill	100	Real del Monte
100	Solid Silver	40	Ray'd & Ely
200	St Louis	350	Silver King
20	Seg Belcher	300	Star
505	Sierra Nevada	1680	S Bulwer
500	Trojan	415	S Bodie
195	Union Con	100	Summit

50	Syndicate	1400	Oriental
135	Tioga Con	150	Queen Bee
50	Tiptop	20	Real del Monte
450	University	100	Raymond & E
195	Wales	300	Star

Saturday A.M., Jan. 24.

180	Alta	1380	S Bulwer
610	Andes	550	Syndicate
770	Argenta	200	S Noonday
360	Albion	280	S Bodie
1650	Addenda	500	Tuscarora
400	Atlas	390	Tioga Con
350	Best & Belcher	200	Tiptop
1520	Belcher	300	University
545	Bullion	440	Wales
1065	Benton		
50	Belmont	**Tuesday A. M., Jan. 27.**	
50	Belle Isle	70	Alpha
250	Belvidere	330	Alta
50	Bodie	540	Andes
430	Bechtel	15	Benton
615	Black Hawk	330	Bullion
350	Booker	1380	Belcher
50	Boston	230	Best & Belcher
30	Bulwer	140	Challenge
305	Con Virginia	285	Caledonia
165	Chollar	845	Chollar
650	Con Imperial	930	Con Dorado
475	California	175	California
725	Crown Point	175	Con Virginia
200	Confidence	210	Crown Point
745	Challenge	950	Con Imperial
140	Caledonia	200	Dardanelles
750	Caledonia	165	Exchequer
125	Cosmopolitan	650	Flowery
975	Con Dorado	270	Golden Gate
150	Champion	50	Gould & Curry
50	C Pacific	725	Hale & Norcross
725	Day	345	Julia
340	Exchequer	950	Justice
75	Eureka Con	400	L Bryan
900	Endowment	395	Lady Wash
90	Flowery	140	Mexican
1900	Fairfax	1650	Mackey
400	Gould & Curry	585	N Bonanza
250	Golden Gate	250	New York
1200	Gila	140	Ophir
150	Grand Prize	185	Overman
200	Goodshaw	350	Occidental
210	H & Norcross	100	Potosi
100	Hillside	50	Savage
50	Independence	890	Julia
890	Julia	200	Justice
200	Justice	300	Jupiter
20	Kentuck	440	Scorpion
1550	Lady Bryan	1165	Sierra Nevada
1190	L Wash	500	Trojan
60	Leviathan	260	Utah
500	Leeds	475	Union Con
65	Mexican	2200	Wells-Fargo
1200	Mackey	550	Ward
600	Metallic	55	Yellow Jacket
50	McClinton		AFTERNOON SESSION.
500	May Belle	490	Argenta
350	Mono	300	Albion
345	Mammoth	100	Addenda
1115	New York	600	Altas
350	N Bonanza	80	Belmont
345	Northern Belle	160	Belle Isle
200	Noonday	20	Bulwer
150	Ophir	145	Bechtel
415	Overman	235	Black Hawk
150	Occidental	500	Booker
100	O Gold Hill	200	Boston
900	Oriental	250	Belvidere
535	Potosi	55	Con Virginia
650	Queen Bee	100	Caledonia
100	Raymond & E	900	Day
430	Real del Monte	100	Dudley
130	Savage	110	Eureka Con
775	Sierra Nevada	600	Endowment
770	Silver Hill	200	Grand Prize
305	Scorpion	350	Gila
150	Solid Silver	100	Goodshaw
20	Seg Belcher	30	Golden Terra
200	Star	75	Hillside
20	Syndicate	200	Leopard
150	Summit	550	Leeds
235	South Bodie	200	Manhattan
300	S Noonday	250	Metallic
280	S Bulwer	95	Mt Diablo
150	Tioga	30	McClinton
300	Trojan	200	May Belle
50	Tiptop	300	Martin White
65	Utah	495	Mammoth
190	Union Con	165	Northern Belle
1090	Wales	110	Navajo
200	Wells-Fargo	80	Noonday
115	Ward	550	Oriental
245	Yellow Jacket	100	Paradise

Monday A. M., Jan. 26.

70	Alpha	225	Raymond & E
170	Alta	735	Star
570	Andes	310	Silver Hill
160	Benton	250	Syndicate
265	Bullion	450	S Bodie
1135	Belcher	1510	S Bulwer
155	Best & Belcher	115	S Noonday
175	California	325	Tioga
50	Confidence	800	Tiptop
330	Con Imperial	330	University
230	Crown Point	300	Vortex
120	Con Virginia	185	Wales
320	Chollar		
280	G Dorado	**Wed'sday A.M., Jan. 28.**	
470	Caledonia	170	Alta
75	Cosmopolitan	590	Andes
100	Con Washoe	115	Belcher
50	Challenge	175	Bullion
100	Dardanelles	300	Best & Belcher
310	Exchequer	240	Benton
200	Flowery	820	California
500	Fairfax	1165	Con Imperial
145	Gould & Curry	255	Con Virginia
100	Golden Gate	210	Chollar
125	Hale & Nor	700	C Dorado
200	Julia	700	Crown Point
370	Justice	70	Challenge
1490	Lady Bryan	235	Caledonia
890	Lady Wash	320	Exchequer
570	Mackey	350	Flowery
520	Mexican	100	Fairfax
700	N Bonanza	30	Gould & Curry
250	New York	70	Golden Gate
240	Ophir	120	Hale & Nor
100	O Gold Hill	180	Justice
110	Overman	450	Julia
275	Potosi	620	Lady Wash
130	Savage	1300	L Bryan
10	Seg Belcher	200	Leviathan
530	Sierra Nevada	185	Mexican
200	Solid Silver	150	Mackey
240	Silver Hill	930	N Bonanza
125	Scorpion	600	New York
350	Trojan	110	Occidental
30	Utah	100	Ophir
190	Union Con	60	Overman
50	Ward	150	Potosi
95	Yellow Jacket	10	Seg Belcher
	AFTERNOON SESSION.	80	Savage
4130	Argenta	780	Sierra Nevada
450	Albion	415	Silver Hill
700	Addenda	550	Solid Silver
250	Boston	340	Scorpion
250	Bechtel	50	Trojan
25	Belle Isle	205	Union Con
30	Bulwer	165	Utah
120	Booker	100	Wells-Fargo
1080	Champion	320	Ward
20	C Pacific	190	Yellow Jacket
700	Day		AFTERNOON SESSION.
300	Dudley	850	Albion
1550	Endowment	450	Addenda
255	Grand Prize	560	Belle Isle
350	Goodshaw	200	Belmont
330	Gila	325	Bechtel
100	Golden Terra	845	Belvidere
280	Hillside	100	Bulwer
250	Independence	350	Boston
600	Jupiter	350	Black Hawk
500	Leopard	500	Booker
180	Leeds	1080	Champion
275	Manhattan	750	Day
600	Metallic	100	Dudley
65	Mono	100	Endowment
70	Mt Diablo	630	Gila
70	Noonday	275	Goodshaw
565	Northern Belle	465	Grand Prize
300	Navajo	50	Independence

MINING SHAREHOLDERS' DIRECTORY.

Compited every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	2	20	Dec 10	Jan 14	Feb 3	T H Dixon	238 Montgomery st
Alta S M Co	Nevada	16	50	Dec 18	Jan 22	Feb 10	W H Watson	302 Montgomery st
Andes S M Co	Nevada	13	25	Dec 18	Jan 23	Feb 16	B Burris	Nevada Block
Bechtel Con M Co	California	4	25	Dec 22	Jan 30	Feb 9	W H Lent	Nevada Block
Belle Isle M Co	Nevada	1	30	Jan 27	Mar 3	Mar 25	E M Hall	327 Pine st
Belvidere M Co	California	5	25	Dec 18	Jan 27	Feb 21	C V D Hubbard	203 Bush st
Booker Con G M Co	California	4	20	Dec 30	Feb 4	Feb 24	W H Lent	309 Montgomery st
Bullion M Co	Nevada	13	50	Jan 26	Feb 28	Mar 17	J M Brazell	328 Montgomery
Caledonia M Co	Black Hills	5	50	Dec 18	Jan 27	Feb 12	——	6 & 7 Stock Ex
Champion M Co	California	5	20	Dec 24	Jan 30	Feb 20	J Crockett	302 Bush st
Con. Imperial M Co	Nevada	10	20	Dec 10	Jan 14	Feb 4	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	40	50	Jan 15	Feb 19	Mar 11	J Newlands	203 Bush st
Double Standard M Co	California	2	5	Jan 15	Feb 14	Feb 4	W H Lent	309 Montgomery st
El Tesoro	California	8	25	Dec 15	Feb 28	Mar 20	W H Chickering	214 Sansome st
Europa M Co	Nevada	8	10	Dec 30	Feb 3	Mar 6	J L Fields	240 Montgomery st
Exchequer M Co	Nevada	15	50	Jan 13	Feb 17	Mar 9	C E Elliott	327 Pine st
Gila S M Co	Nevada	6	25	Jan 15	Feb 7	Mar 9	W W Parrish	328 Montgomery st
Goodshaw M Co	California	2	25	Dec 24	Jan 5	Feb 2	V Fernbach	327 Pine st
Gould & Curry S M Co	Nevada	37	1 00	Jan 6	Feb 11	Mar 4	A K Durhrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	63	1 00	Jan 14	Feb 19	Mar 11	J F Lightner	309 Montgomery st
Independence M Co	Nevada	5	30	Jan 13	Feb 17	Mar 9	E M Hall	327 Pine st
Iowa M Co	Nevada	8	10	Jan 21	Feb 23	Mar 11	R L Thomas	411½ California st
Lady Bryan M Co	Nevada	4	50	Dec 27	Jan 30	Feb 28	——	203 Bush st
Lady Washington Con M Co	Nevada	1	20	Jan 26	Feb 14	Mar 6	W H Watson	302 Montgomery st
Mammoth M Co	California	3	1 00	Dec 5	Jan 15	Feb 13	A W Field	302 Montgomery st
Martin White M Co	Nevada	5	60	Dec 10	Jan 12	Feb 3	J J Scoville	309 Montgomery st
Mackey G & S M Co	Nevada	2	15	Jan 3	Feb 7	Feb 26	J M Buffington	303 California st
Mexican M Co	Nevada	10	2 00	Jan 10	Mar 4	Mar 26	C L McCoy	203 Bush st
Mono M Co	California	6	30	Dec 22	Jan 26	Feb 16	——	62 Nevada Block
Mountain View S M Co	Nevada	1	25	Dec 31	Feb 10	Feb 28	J Moore	309 California st
New York M Co	Nevada	21	5	Jan 26	Feb 28	Mar 20	D L Thomas	303 Bush st
Original Gold Hill G & S M Co	Nevada	8	15	Dec 20	Jan 26	Feb 14	J M Buffington	309 California st
Scorpion S M Co	Nevada	6	25	Jan 6	Feb 10	Mar 2	G R Spinney	310 Pine st
Senator M Co	Nevada	1	10	Dec 22	Jan 24	Feb 21	L Reynolds	317 Mission st
Sierra Nevada S M Co	Nevada	61	3 00	Jan 6	Feb 11	Mar 3	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	9	50	Jan 2	Feb 5	Feb 26	W E Dean	203 Bush st
South Bodie G M Co	California	2	10	Jan 16	Feb 18	Mar 10	——	309 Montgomery st
South Bulwer M Co	California	6	25	Jan 20	Feb 24	Mar 17	W Stuart	320 Sansome st
South Utah M Co	Nevada	4	10	Dec 22	Jan 24	Feb 13	W S Hinkle	207 Sansome st
Trojan M Co	Nevada	2	25	Dec 23	Jan 26	Feb 16	D Wilder	328 Montgomery st
Utah S M Co	Nevada	28	2 00	Dec 18	Jan 21	Feb 9	G C Pratt	309 Montgomery st
Ward G & S M Co	Nevada	5	40	Dec 10	Jan 16	Feb 5	Jacob Stadtfeld	419 California st
Yellow Jacket S M Co	Nevada	35	1 00	Dec 19	Jan 23	Feb 23	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Ætna M Co	Arizona	1	05	Dec 23	Jan 29	Feb 18	J S Benear	420 Montgomery st
Alhion M Co	——	1	10	Jan 15	Feb 27	Mar 26	——	7 Stock Exchange
Atlanta M Co	Utah	1	05	Dec 23	Jan 29	Feb 18	A F McGrew	420 Montgomery st
Black Rock M Co	California	1	03	Dec 14	Jan 20	Feb 24	N T Root	227 Beale st
Bulte Gravle Hydraulic M Co	California	4	15	Dec 31	Feb 5	Feb 25	R L Taylor	230 Montgomery st
Giant and Old Ahe M Co	——	3	50	Nov 21	Dec 31	Feb 10	——	49 Nevada Block
Gover M & M Co	California	40	10	Dec 24	Feb 2	Mar 1	W O Wilson	402 Front st
Headlight M Co	California	1	15	Dec 4	Jan 17	Feb 12	A W Field	302 Montgomery st
Ivanpah M & M Co	California	1	10	Jan 19	Feb 23	Mar 11	E J Friedlander	309 California st
Jupiter M Co	California	7	10	Jan 23	Feb 23	Mar 19	E C Masten	309 Montgomery st
Lady Emma G M Co	California	1	10	Jan 13	Feb 20	Mar 20	F R Bunker	606 Montgomery s
Leeds S M Co	Utah	1	10	Jan 17	Mar 3	Mar 31	——	7 Stock Ex
Liberty Hill Con M & Water Co	Cal	1	60	Dec 30	Jan 16	——	J W Pew	310 Pine st
Mariposa Land and M Co	California	17	50	Dec 10	Feb 2	L Leavitt		309 Montgomery st
Mayhelle Con M Co	California	4	05	Dec 13	Jan 19	Feb 10	W J Taylor	310 Pine st
Mayflower Grav M Co	California	7	10	Jan 19	Feb 23	Mar 16	J Morizio	328 Montgomery st
Monte Chisto Con G M Co	California	2	10	Dec 22	Jan 26	Feb 20	B Burris	Nevada Block
Phœnix	——	22	30	Jan 19	Feb 20	Mar 26	——	7 Stock Ex
Rocky Point M Co	California	2	10	Jan 14	Feb 20	Mar 11	A O Taylor	314 Bush st
Star M Co	California	3	10	Dec 10	Jan 15	Feb 10	——	320 Sansomo st
Tuscarora M & M Co	Nevada	5	15	Jan 24	Mar 1	Mar 22	M E Sperling	309 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Belvidero G & S M Co	——	E Edwards	330 Pine st	Special	Feb 9
Champion M Co	Nevada	J Crockett	203 Bush st	Special	Jan 31
Father De Smet Con G M Co	Dakota	T Widman	404 Montgomery st	Annual	Feb 6
Manhattan S M Co	Nevada	J Crockett	203 Bush st	Annual	Feb 4
Metallic M Co	——	W Willis	309 Montgomery st	Annual	Feb 9
Standard Con M Co	California	W Willis	309 Montgomery st	Annual	Feb 2
Sulphur Bank G M Co	——	C Hermann	220 Sansome st	Annual	Feb 2
Wide Awake P & M Co	——	C Hildebrandt	232 Sutter st	Annual	Feb 10

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Black Bear Q M Co	California	W L Oliver	Safe Deposit Bldg	50	Jan 27
Bodie Con M Co	California	W H Lent	Nevada Block	25	Feb 2
California M Co	Nevada	C P Gordon	Nevada Block	50	Dec 22
Con Virginia M Co	Nevada	A W Havens	Nevada Block	50	Dec 23
Eureka Con M Co	Nevada	P Jacobus	37 Nevada Block	50	Jan 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	30	Jan 24
Ophir S M Co	Nevada	C L McCoy	203 Bush st	1 00	Jan 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Jan 12

SALES OF LAST WEEK AND THIS COMPARED

Thurs'd'y A. M., Jan. 22.

70	Alpha	330	Andes
100	Andes	35	B & Belcher
40	Alta	3105	Belcher
2360	Belcher	160	Bullion
30	Best & Belcher	130	Benton
410	Bullion	345	Chollar
550	Benton	1020	Con Virginia
180	Con Imperial	170	California
100	Con Virginia	200	Con Imperial
910	Chollar	395	Crown Point
50	Confidence	100	Con Washoe
830	Challenge	100	Challenge
170	Caledonia	1405	Caledonia
345	Crown Point	590	O Dorado
135	California	150	Dardanelles
140	Cosmopolitan	385	Exchequer
450	Con Dorado	50	Essex
150	Dardenelles	35	Fairfax
185	Exchequer	300	Gould & Curry
950	Flowery	300	Golden Gate
100	Fairfax	135	Hale & Nor
165	Gould & Curry	465	Julia
450	Golden Gate	120	Justice
125	Hale & Nor	2	Kentuck
525	Justice	705	Lady Bryan
345	Julia	655	Lady Wash
75	Kentuck	400	Leviathan
300	Leviathan	100	Mexican
3800	Lady Bryan	250	New York
1700	Lady Wash	170	N Bonanza
1·0	Mexican	180	Ophir
3500	Mackey	190	Overman
930	New York	210	Potosi
710	N Bonanza	10	Savage
600	New York	185	Sierra Nevada
110	Occidental	415	Silver Hill
150	Ophir	550	Solid Silver
60	Overman	340	Scorpion
150	Potosi	50	Trojan
10	Seg Belcher	205	Union Con
80	Savage	165	Utah
780	Sierra Nevada	100	Wells-Fargo
415	Silver Hill	320	Ward
550	Solid Silver	190	Yellow Jacket
340	Scorpion		AFTERNOON SESSION.
50	Trojan	850	Albion
205	Union Con	450	Addenda
165	Utah	560	Belle Isle
100	Wells-Fargo	200	Belmont
320	Ward	325	Bechtel
190	Yellow Jacket	845	Belvidere
	AFTERNOON SESSION.	100	Bulwer
850	Albion	350	Boston
450	Addenda	350	Black Hawk
560	Belle Isle	500	Booker
200	Belmont	1080	Champion
325	Bechtel	750	Day
845	Belvidere	100	Dudley
100	Bulwer	100	Endowment
350	Boston	630	Gila
350	Black Hawk	275	Goodshaw
500	Booker	465	Grand Prize
1080	Champion	50	Independence

Thursday A.M., Jan. 29.

330	Andes	35	B & Belcher
3105	Belcher	160	Bullion
130	Benton	345	Chollar
1020	Con Virginia	170	California
200	Con Imperial	395	Crown Point
100	Con Washoe	100	Challenge
100	Challenge	1405	Caledonia
590	O Dorado	150	Dardanelles
385	Exchequer	50	Essex
35	Fairfax	300	Gould & Curry
300	Golden Gate	135	Hale & Nor
465	Julia	120	Justice
2	Kentuck	705	Lady Bryan
655	Lady Wash	400	Leviathan
100	Mexican	250	New York
170	N Bonanza	180	Ophir
190	Overman	210	Potosi
10	Savage	185	Sierra Nevada
415	Silver Hill	550	Solid Silver
340	Scorpion	50	Trojan
205	Union Con	165	Utah
100	Wells-Fargo	320	Ward
190	Yellow Jacket		AFTERNOON SESSION.
850	Albion	450	Addenda
560	Belle Isle	200	Belmont
325	Bechtel	845	Belvidere
100	Bulwer	350	Boston
500	Booker	1080	Champion
750	Day	100	Dudley
630	Gila	275	Goodshaw
465	Grand Prize	50	Independence

300	Atlas	150	Boston
1105	Argenta	350	Booker
700	Addenda	25	Bodie
50	Belle Isle	250	Belvidere
130	Belmont	500	Champion
150	Belvidere	250	Caledonia (B H)

200 New Coso	40@35c	50 Silver Hill	85c
10 Overman	8	250 Solid Silver	45c
20 Ophir	18½	50 Trojan	30c
10 Potosi	5½	100 Wales	3½
110 Rough & Ready	35@40c	100 Ward	1.90
55 Sierra Nevada	23½	10 Yellow Jacket	11½

California Board—Latest Sales.

Wed'sday A.M., Jan. 28.			
120 Argenta	1.30	20 Sez Belcher	22
660 Atlantic	10@11c	175 S Bodie	20@25c
120 Andes	8½c	110 Scorpion	3½
50 Alta	4.55@4.45	40 Sierra Nevada	27@28
175 Benton	2.80@2.90	30 Trojan	29c
100 Black Hawk	75c	30 Utah	17
275 Belcher	13@12½	40 Union	47½@46
30 Best & Belcher	12½@12	100 Ward	1½
40 Bullion	5½@5.20	200 Wells-Fargo	10c
4½ California	4.65@4.05	100 W Comstock	37½c
105 Con Virginia	4.20@4.15	120 Wales	3c½
250 Con Imperial	75@77c	90 Yellow Jacket	11½@12
110 Crown Point	5½@5	AFTERNOON SESSION.	
50 Chollar	9@8½	80 Alta	4½@4½
150 Caledonia	1.65@1.70	120 Benton	2.85
50 Dardanelles	80c	310 Belcher	12½@12½
150 Goodshaw	35@40c	45 Best & Belcher	12½@12½
30 Gould & Curry	6½	85 Bullion	5½@5½
30 Hale & Nor	7½@7½	30 Chollar	8½@8.55
210 Julia	2½@2½	60 California	4@4.05
130 Justice	2.20	85 Con Virginia	4.10@4.15
200 Leviathan	37@35c	200 Con Imperial	75c
100 Mint	6c	105 Crown Point	5½@5½
40 Mexican	18½@19	50 Challenge	1.95@1.90
340 New York	47½@47c	120 Caledonia	1.55@1.50
200 N Sierra Nevada	7@6c	30 Exchequer	3½
120 Overman	8½	40 Gould & Curry	6½
20 Ophir	18½@19	20 Hale & Nor	7½
50 Potosi	5½@5.20	140 Justice	2.20
100 Queen Bee	30c	150 Mint	8c
		15 Overman	8½
		30 Potosi	5½@5½

Mining Share Market.

The week has been without any movement of note. There has been but little business transacted and nothing to break the monotony in the way of either sudden advance or reduction in prices. The fluctuations have been limited, leaving but little margin of profit to operators.

The usual amount of bullion is coming in from the mines, with a steady increase as the opening of them progresses.

The Alabama and Humboldt Con. M. Co. have declared a stock dividend of 50%.

Mr. Gorley has presented a hill to the State Assembly, prohibiting brokers from loaning the stocks of their customers, left in their hands, and compelling them to return the identical shares when the stock is called for. It meets with general favor from the stock-dealing public.

All attempts to advance prices have been followed by such a speedy unloading by holders to realize, that the market has been forced to yield to the pressure.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Gold Hill (Idaho), Jan. 17, $24,497; Standard, Jan. 19, $21,293.27; Northern Belle, Jan. 19, $10,775.77; Jan. 21, $6,182.01; Star, Jan. 21, $6,800; Hillside, Jan. 22, $6,000; Paradise, Jan. 21, $2,500; Jan. 23, $4,151; Argenta, Jan. 21, $4,910.69; Jan. 26, $16,300; Con. Virginia, Jan. 22, in January to date, $92,703.70; Jan. 24, $43,357.05; California M. Co., Jan. 22, in January to date, $106,814.07; Wells Fargo & Co. at Eureka, Jan. 21, $8,532.75; Jan 24, $5,588.28; Eureka Con., Jan. 21, 32,450 lbs.; Jan. 22, 31,400 lbs.; Jan. 24, two days, 68,860 lbs.; Christie, Jan. 23, $6,195; Union, Jan. 24, $24,835.38; Richmond, Jan. 24, $16,490.40; Belmont, Jan. 19, $2,332.75; Jan. 23, $2,551.97; Ivanpah Con. M. & M. Co., Jan. 23, $9,000; Leopard, Jan. 20, $2,250; Jan. 26, $1,960; Bodie Con., Jan. 27, $14,927.

GRAPHITE AXLE GREASE.—Dixon's American graphite everlasting axle grease, advertised in another column, is now in use in a number of places in this city, both on journals of machinery and on axles of wagons. It is equally useful for light wagons, family carriages or loaded teams, and in fact is adapted for all kinds of journals. It is made from pure Ticonderoga graphite. The old mines formerly worked and the new deposit at Ticonderoga, N. Y., utilized. The J. Dixon Crucible Co., of Jersey City, N. Y., also prepare pure foliated American graphite, which is a perfect lubricator, being entirely free from grit when prepared by the improved Dixon water process. Mixed with oil or grease it is claimed to positively cure hot journals, steps of mills and all troublesome bearings, saving them from much wear and causing them to run easier. Mr. Warren Holt, 717 Montgomery street, agent for the lubricator for this coast, has shown us samples of the foliated lubricator, and examination shows it to be pure and free from all grit. It is put up in small paper cases, tin cans and boxes according to quantity.

ATLANTA CO.'S MINE.—The Atlanta Co.'s mine is located in West Tintic mining district, Juah county, Utah. Those who have seen the mine say that the ore resembles that of the Great Ontario, which has paid its millions in dividends. Utah properties generally are first class. The Atlanta's first assessment of five cents per share will be delinquent February 5th, 1880. The company has been in existence but two years, and has been an example on light assessments.

THE residence owned by Governor Perkins in this city has been sold to John D. Spreckles, for $21,250.

THE extension of the Western Oregon railroad has reached Corvallis.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MINING NOTES.—Amador *Ledger*, Jan. 24: A. McMahon and Isaac Eastman have seemingly struck it rich about half a mile from Peter Denizer's, three miles east of Volcano. They had been prospecting in the neighborhood for a few days, and a week ago came upon a quartz vein in the locality indicated, which, to say the least, is big, with promise of wealth. The prospect hole has been sunk 14 ft; and the vein of ore at the bottom is 10 inches wide, the ledge uniformly widening as the depth increases. Specimens from this discovery were exhibited in Amador City on Wednesday, and the best judges of quartz there gave it as their opinion that rock of that character would yield $100 per ton. A quarter of a pound of quartz in which no free gold was visible, was pounded up, and surrounded nearly a quarter of a dollar in gold. No gravel mining is going on at present. The water remains frozen in the ditches. Col. Heath has thrown up his contract on the big tunnel. The tunnel company have the work in hand now, with Mr. Moyle superintending the operations.

NORTH GOVER.—The drift has been run 40 ft on the last contract. There is a small vein of white quartz 18 inches wide, which carries little or no gold.

DEWITT.—This claim at Murphy's ridge has been put in excellent running order. A ditch has been dug, 204 rods, to connect with the Moore ditch. A flume, 1,320 ft long, connects with the ditch and carries the water to the summit of the ridge. The ditch is constructed to carry 300 inches of water, but not more than 125 inches will be required on the claim. Water has been turned into it, and mining operations on a large scale may be carried on right over the ridge. The ditch and flume cost $700. Two hundred ft of new pipe is expected in a few days, when everything will be in readiness to commence washing. From rock taken from strata of decomposed quartz, Dewitt has pounded out by hand mortar, something like $5,000 since May last.

OTHER MINES.—The Lincoln mine and mill give employment to 80 men. Report says that the 40 stamps of the Con. Amador mill are to be started up shortly. The rock is low grade, and it is only by getting through a large quantity that it can be made to pay. The prospect is fair for the ledge to improve in quality as depth is attained. The operations at Butte Basin are confined to taking out the water. The Amador Gravel company are preparing a blast that will consume 5,000 pounds of powder. They expect to fire it on Monday next.

BUTTE.

BUCHANAN HILL.—Oroville *Mercury*, Jan. 23: Work has been resumed, and a new gravel pulverizer will be erected soon.

HENDRICKS.—Things are in full blast, and the prospect of good returns is favorable. They are working upon new ground further down the ravine.

CALAVERAS.

BOSTON.—Calaveras *Chronicle*, Jan. 24: Col. Robinson, Superintendent of the Boston, showed us some fine specimens from that mine lately. The rock showed rich in free gold and sulphurets. The developments at the Boston are altogether favorable, and the prospects that the mine will prove a valuable one are flattering in the extreme.

MONO.

STANDARD CON.—Bodie *Free Press*, Jan. 20: The north drift, 385 level, is in from the main east crosscut 635 ft. The ledge in this drift is four ft wide of good ore. The upraise from this drift is 30 ft above the level, showing a ledge five ft wide of good milling ore. The south drift is in 305 ft, with a ledge in the face three and a half ft wide of fine ore. The upraise from this drift is 29 ft. The ledge is three ft wide and looks well. The east crosscut, 500 level, is in 170 ft. The crosscuts on the 700 level are making the usual progress. The east crosscut is in a very favorable formation. In the west crosscut the rock is very hard. The shaft has reached a depth of 55 ft below the 700 level. The rock in the bottom is very hard. The north drift on the east ledge, 300 level incline, is in 210 ft, showing a ledge two ft wide of good milling ore. The south drift from the west crosscut, 300 level incline, is in 135 ft. The ledge in this drift is three ft wide of good ore. The ledge in the stopes, north drift, 335 level, is from 12 to 20 wide ft of good grade ore. In the south drift, 550 level, the stopes are looking well, the ledge being 10 ft wide of good milling ore. The West Standard is looking well. The ledge is five ft wide of rich ore.

BELVIDERE.—The east crosscut, 400 level, is in 35 ft; the ground is a little softer and works better. This hard belt of rock has either carried the ledge further to the east than was expected, or there has been a break in the ledge which carried it back in the shaft, so changed in its character and appearance that it was not recognized. In order to hasten the solution of the problem, drifts have been started north and south on the ledge in the station, from which an upraise will be run to the point where the rich ore is known to exist, say 30 ft above, that is, should this ledge prove to be the main ledge which had run in the shaft for nearly 60 ft between the 300 and 400 levels. In the latter case the drifts north and south will be continued in the belief that the rich ore chimney will make downward in one direction or the other, or both, for it is likely that this station is in a broken portion of the ledge.

JUPITER.—The tank stations at the 200 and 400 levels and bob-pit at the 250 level are nearly completed, as well as the tanks. The boilers will be put into position. More or less delay has been occasioned by storms in getting in some portions of the timbers and lumber, but all is now plain sailing. The last of the engine foundation timber has now on the ground, as well as everything required except the plunger pumps for the 400 station and a portion of the pump-rod. On account of the work in the shaft, work has not yet been resumed on the 500 level, but will be shortly.

BULWER CON.—The north drift on the Stonewall ledge, 480 level, is in 22 ft. The ledge is 18 inches wide, and looking well. The south drift is in 28 ft, showing a ledge two ft wide of good ore. The north drift from the tunnel on the Ralston ledge is in 10 ft. The ledge is three and a half ft wide of good milling ore. The south drift is in 23 ft, with a ledge in the face two and a half ft wide. The west crosscut from the 100 level of the Bodie mine is in 93 ft, and during the past week cut through a ledge three ft wide of good milling ore.

GOONSHAW.—The shaft has now attained a depth of 553 ft. A few days since a very strong flow of water was encountered. The pumping machinery is working splendidly, but is not working to its full capacity. The shaft is being sunk rapidly. As soon as the 600 level is reached the company will crosscut for the ledges which are prospected on the 450.

BOOKER CON.—The new plunger pump, No. 2, is at work, and the sinking pump has been disconnected, but is in place, ready to resume sinking at any time. The crosscut east, 480 level, is in 30 ft. The east crosscut, 400 level, is in 110 ft. Several stringers have been cut in the bottom. The vein should be cut in about 40 ft from the face of this crosscut. Everything is working well.

BODIE TUNNEL.—Work is progressing. Within the past two weeks three ledges have been cut, of very good milling ore. As soon as the roads are in fit condition to move lumber, the company will put up the machinery at the mouth of the tunnel for the purpose of running Burleigh drills in the face and to ventilate the mine.

ORIGINAL SUMMIT.—This claim is located on the west side of High Peak hill. The vein is not large, but is very rich, and may be found to increase in size on attaining depth. An incline shaft is down on the vein 105 ft. A drift will be run on the vein. Two shifts are kept constantly at work.

DOUBLE STANDARD.—The north drift from the east crosscut, 200 level, been run since last report, 11 ft; total length, 77 ft. The rock is somewhat harder. The south drift, same level, is now in 78 ft; progress for the week, 11 ft, with no change to note.

SUMMIT.—The north drift, 530 level, is in 49 ft; progress since last report, 12 ft. The ledge in this drift is three and a half ft wide, and looks well. The south drift has been extended during the past week, 11 ft; total length, 50 ft, showing a ledge two ft wide.

DUDLEY.—The main west crosscut, 500 level, is in 100 ft; progress, five ft per day. The favorable ground mentioned in last report still continues without material change. The pumps and machinery are all working well.

SOUTH STANDARD.—Timbering shaft with square sets from the surface to the 400 level is now nearly completed. It will then be level with the Booker, and when this is finished the surface will be ready for machinery.

HARRINGTON.—Bodie *News*, Jan. 22: The tunnel has reached a total length of 650 ft, and a winze is sunk 80 ft from the face of the tunnel, to a depth of 63 ft, showing a ledge three ft in width of good milling rock. There is a seepage of water, but work is not retarded. The ledge pitches to the east an angle of 80°, and will intersect the La Grange and Cronise ledges at a depth of 150 ft from bed of the tunnel.

ADDENDA.—During the week past they have been busily engaged moving the machinery from the old shaft to the new three-compartment shaft, preparatory to commence sinking by steam. All the machinery has been transferred and will at once be placed in position and hoisting commenced early next week, should no accident occur in the meantime. The new shaft has been sunk to a depth of 124 ft, and will be pushed rapidly down as soon as everything is in readiness for that purpose. The building over the new shaft is nearly completed and will be finished at an early date, when it will compare favorably both as to appearance and usefulness with any works on the lode.

CHAMPION.—Excavating is going on outside of the main building for the reception of the boilers. The main building is 80 ft in length, with the addition of boiler house and carpenter shop on either side. All the masonry for the bed, on which the new engine and boiler will rest, has been completed, and everything made ready to put the pumping gear in place. The foundation for the engine and pump is 50 ft in length, and is of the most substantial character. Men are at work in the shaft cutting out stations, one at 400 ft and the other at 200, for the pumps when ready to be placed. The pumping engine is compound, with 19x26-inch cylinder, has five-ft stroke, and is similar in character to the Cornish pumps in use, and a *fac simile* of the one now at work in the Julia mine on the Comstock. This pump is one of the cheapest and best in use, and will throw a large volume of water. Work is being done below ground in clearing out the east crosscut to the winze.

A mine owned by Charles Fisher (the name of which we did not ascertain) is also turning out ore, which yields largely—2,400 pounds having just returned 131 ounces. Campbell No. 2 shows an immense body of ore, and the owners are pushing work vigorously, taking out about four tons per day. It is thought that this ore will work up to 150 ounces to the ton. Nolson's mill is crowded with Georgetown ore, and the returns are giving entire satisfaction. The great lack of the district, and in fact the entire country, is adequate milling facilities. A large custom mill at Lone Mountain could be kept constantly supplied with ore, and under proper management would yield a large income to its owners.

NEVADA.

NONE SUCH.—Grass Valley *Union*, Jan. 23: This is a prospecting operation, near the lower Colfax road, about six miles from town, in the hills bordering Dry creek, and is being carried on by C. W. Smith and Milton Green, who have a shaft down about 20 ft, which is showing very heavy sulphureted ore that assays well in both gold and silver. The ore is peculiar in appearance, and from this fact the location takes its name, as "none such" has been found before in this section of the country. Although the shaft has reached but its present depth, the ledge is well defined and strong, and the owners feel encouraged to believe they have a rich mineral-bearing vein.

IDAHO.—The shaft of this mine has reached a depth of 80 ft below the No. 11 level, or a total depth of over 1,250 ft, showing a strong ledge of quartz.

DEADWOOD.—Grass Valley *Foothill Tidings*, Jan. 24: A nugget, valued at $200, was taken from the gravel claim of ex-Assemblyman Blackwell, at Snow Point, last week.

AMERICAN.—North San Juan *Independent*, Jan. 24: A blast, the largest ever fired on the ridge, was exploded Saturday evening last. Five hundred cases of Judson powder were used, equal to 25,000 pounds or 12½ tons. The main powder drift was 80 ft in length. There were also two other drifts run from either side the main drifts, making the whole the shape of a T. One of the side drifts was 67 ft long while the other was 60 ft. The shock occasioned by the explosion was so great at this place as to frighten people. A vast amount of ground has been pulverized by the blast, and excellent things are expected to result from its success. It has not been till recently that the mine has paid anything above expenses, but the last two clean-ups have proved conclusively that rich ground is being approached. The American mine owners have proved themselves a plucky set of men, and have surmounted great obstacles.

RICH STRIKE.—Nevada City *Transcript*, Jan. 24: One of the richest finds in the way of quartz that has occurred in this locality for many a day, was brought to light yesterday. Mr. E. Herring, who resides near Campooda, while out prospecting recently, came upon a ledge which had indications of being gold bearing. After sinking on it for a short distance, and picking out pieces of quartz from the lead, which varies in thickness from 12 to 18 inches, he found a strata running through the center of it, about four inches thick, literally filled with fine gold. One piece, weighing half a pound, Mr. Herring was offered $20 for, but refused it. A larger piece, weighing about two pounds, was valued at nearly $100. The exact locality of the rich strike is at present kept a secret, but a number of our gold hunters went out yesterday to try and find it, in order to stake off an extension.

HAYWARDS.—Washing was to have been recommenced at Hayward's claim, Dutch Flat, a couple of days since, the breaks in the ditch having been repaired.

BLUE TENT CON.—The Blue Tent Con. mining company resumed washing Friday morning with 1,000 inches of water. Operations had been suspended ever since the big snow storm of a couple of weeks ago, which had shut off the water supply.

NORTH BLOOMFIELD.—The North Bloomfield gravel mining company have succeeded in opening their ditch, and are at work again, after a rest of a few days. The electric light lately erected in their mine is an assured success.

MERRIMAC.—In this drift claim, which is situated adjoining the Round Mountain, in this township, gravel, carrying large quantities of a yellow metal, supposed by the owners to be copper, has been struck. Assays have been made showing the material to be gold, and the large deposits of gravel contain enough of it to pay abundantly for working.

MINING ITEMS.—Nevada City *Herald*, Jan. 24: The El Capitan mine is having new eight-inch pumps made for each of their claims. The Merrimac mine was the scene of great excitement this morning. Some rich prospects were struck. Mining at Sailor Flat is at present at a standstill, on account of the ditches being frozen. The Round Mountain mine is working on a 10-ft body of good pay gravel. The Deadwood mine is now crushing 300 tons of good rock. It is the largest crushing ever made by that mine. The Lord mine, which has been idle for some time, has again resumed work. There is already a tunnel driven in 700 ft. This mine has a three-ft ledge, and is in gold-bearing quartz. The above mine is situated on the Newtown road. The Buelow mine has stopped sinking the shaft and has commenced tunneling from the south side of the Yuba. The ore taken out at this place looks fine, and the owner feels highly elated over this discovery. The mine being close to the Excelsior ditch, the cost of running a mill would be slight. The Sargent & Jacobs mine, at Quaker hill, has sunk a shaft 200 ft and drifted 550 ft to center of channel. On the 1st of October they started to sink a new shaft to reach this point. Connection was made last Monday evening after reaching a depth of 180 ft. It will be necessary to sink the shaft some distance further to bedrock before taking out gravel. Daniel Oetchell, D. Rescigh and A. Turner, are taking out some splendid rock from their mine near Canada hill. The mine of Snider & Co. has a bright outlook. An assay gave $40.50 per ton in free gold. They have over 100 tons of the same rock on the dump. Two arastras have been purchased for grinding, there being no mill within the vicinity of Columbia Hill, where it is located. The ledge averages three ft in thickness. Milton Baugh and others are working on a new ledge on the south fork of Humbug creek, about half a mile north of Bloomfield. They have reached a depth of 20 ft. The ledge, which is four ft thick, shows well in sulphurets and galena. Several assays have been made and proved satisfactory. The owners are confident of success.

SIERRA.

DOWNIEVILLE, Jan. 25.—The Bald Mountain gravel company yesterday realized 399 ounces of gold. Average daily yield, about 300 ounces.

TUOLUMNE.

SAN GUISSEPPE MINE.—Sonora *Union-Democrat*, Jan. 24: The San Guisseppe mine is located on Dragoon gulch. Parties who have a lease are taking out ore. The prospects made of rock taken from the pile were rich with gold. The vein is a small one, averaging not more than a foot. The last ore milled paid upwards of $40 to the ton. For some weeks operation was suspended on account of water.

OLSEN.—Ten tons of ore from the Olsen mine have been worked at San Francisco, yielding enough to pay for all work and improvements. This showing proves the great richness of the ore.

LAKE.—Tuolumne *Independent*, Jan. 24: The assays made by Robert Towle from this claim are $900 gold and about $50 silver per ton. An assay made by Mr. Barry, of Quartz Mountain, went $2,300 gold and about $56 silver per ton. The width of the vein is said to be 100 ft, and the ore resembles that of Leadville. Two roads from Sonora have been surveyed—one by Baker's, the other by Crane's flat. Distance from Sonora, 65 miles, with good grade for a railroad.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Jan. 29: On the 2500 level the main north drift continues in vein matter 140 ft from the incline. In the Hardy vein the explorations north and south, on the 2200 level, are in low-grade quartz.

SIERRA NEVADA.—In crosscut No. 2, 2400 level, running west from the main north drift, six ft of ore has been encountered and the vein penetrated 10 ft. Crosscut No. 3, 205 ft from the incline, is nearing the same ore body. The north drift on this level is in vein material; total length, 225 ft. On the 2300 level the drift north from the east shaft is in 400 ft. Three hundred ft north of the east shaft a crosscut has been started west and run 55 ft, and is in vein matter.

CALIFORNIA.—The north drift from the main crosscut west on the 850 level is 224 ft. The stopes below the 1750 level maintain their yield. The north drift on the 2250 level has its face in vein matter 285 ft from the C & C shaft.

GOULD & CURRY.—A station is being prepared at a point in the joint Best & Belcher cast crosscut, 1700 level, under the new joint shaft, from which to send a diamond drill upwards 540 ft, to tap and drain into the Sutro tunnel the heavy flow of water there encountered. At the O. & C. and B. & B. shaft sinking is going on as usual; total depth of the shaft, 890 ft.

UNION CON.—Good milling ore continues to be found in the drift south and east of the old ore body on the 2400 level, from which the winze is to be sunk to the 2500 level. The heavy vein formation encountered, and which carries stringers of good ore all along, shows signs of making south and down.

MEXICAN.—The north drift on the 2300 level has a total length of 450 ft, leaving 160 ft yet to run to connect with the joint Union winze from the 2000 level, and complete the connections between the Ophir incline and the Union shaft on this level. Connection has been made between the joint Union winze from the 2000 level and the 2300 level by a raise from the Union drift south.

CON. VIRGINIA.—On the 2150 level the joint Best & Belcher crosscut east is in very promising vein matter. Ore is being extracted in No. 1 winze on the 1750 level and east of the old stopes on the 1550 level.

BELCHER.—The east drift, 3000 level, is in 145 ft; south drift on this level, 102 ft. The south drift, 2760 level, is in 30 ft, and the ore vein has been followed on this level over 40 ft.

SAVAGE.—The incline has a depth of 175 ft on the slope below the 2200 station, and is being continued down to meet the drift aimed to connect with it from the 2400 level of the C. N. S. shaft.

UTAH.—The incline has now reached 164 ft on the slope below the 1750 station. The south lateral drift on the 1750 level is in 67 ft from the incline. The crosscut east from the station is in 45 ft.

CHOLLAR.—The pumps have been put to work in double line to the 2400 level. The west drift from the 2400 station of the C. N. S. shaft has a length of 000 ft. From a point 535 ft west of the shaft the drift south for Potosi ground has been started.

JUSTICE.—The raise from the 1650 level has reached the winze from the level above and affords much better ventilation.

YELLOW JACKET.—The shaft has a depth of 2,863 ft. The north winze is now 80 ft on the slope below the 2700 level. The north drift is being extended to meet that from the 2800 level in the Con. Imperial.

ANDES.—The drift west on the 350 level has been turned north, and is following good indications in that direction. The 200 level is being cleaned out and repaired, preparatory to connecting it with the 350 level by a winze.

HALE & NORCROSS.—Strong influx of water hinders progress in the winze from the 2200 level; total depth, 120 ft. The north crosscut, 2200 level, is in 60 ft.

CON. IMPERIAL.—The sump of the south incline has been completed below the 2300 level.

JULIA CON.—The south lateral drift, 2000 level, has some very good looking rock. The winze is down 230 ft and is in porphyry.

ALTA.—Drifting north and south on the 1050 level and in promising vein matter. When these drifts attain a length of 200 ft, each crosscut will be run and the vein explored.

OVERMAN.—The crosscut east on the 1900 level has made good progress.

BULLION.—The sump below the 2350 level of the incline is completed. The station on that level is to be excavated preparatory to crosscutting the ledge at this level.

BEST & BELCHER.—Crosscutting east joint with Con. Virginia on the 2150 level and encountering some promising vein material.

SILVER HILL.—Very promising-looking vein material is still encountered in the face of the east crosscut on the 1300 level.

SUTRO TUNNEL.—The headers of both the north and south lateral branches are in vein material requiring to be timbered.

EUREKA DISTRICT.

EUREKA CON.—Eureka *Leader*: The water problem has solved itself without any work or interference from the management. The flow of water is just as heavy as when it first broke in from the K K ground, but its disappearance is as rapid. It comes in on the twelfth level and pours into a winze sunk to the west of the incline. In the winze it rises within 3 ft of the top, and that is the last seen of it. Oceans of water have been poured into that hole, and still it carries off the immense volume. There is no doubt that an underground channel has been struck, and its opening solves the question of drainage effectually and without cost or expense. The 13th and 14th levels are still filled with water, but they can be

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A Review of the Modern Doctrine of Evolution.

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tbis time is likely to bs wanting from tbe offspring. The causes of accceleration and retardation may next claim attention.

It is well known tbat the decomposition of tbe nutritivs fluids within living animals gives rise, in the appropriate tissues, to exhibitions of diffsrent kinds of forces. Tbese are motion in all classes; heat in some only; in a still smaller number, electricity and light; in all, at certain times, growth-force or hathmism; in many, phrenism, meutal or tbought-force. Tbess are all derived from equivalent amounts of chemical forcs which are liberated by the dissolution of protoplasm. This organic substance, consisting of CHON, undergoss retrograde metamorpbosis, being resolved into the simpler CO_2, HO, etc., and necessarily liberating force in tbe process. None of the functions of animal life can bs maintained without supplies of protoplasm. We bave hsre to do with batbmism. It consists of the movement of material to, and its deposition in, certain definite portions of the growing egg, or fœtus, as the case may be. It is different in its movements in every species, and its direction is probably the resultant of a number of opposing strains. In tbe simplest animals its polar equilibrium is little disturbed, for these creaturss consist of nearly globular masses of cells. As we ascend ths scale a greater and more marked interference becomes apparent; radiated animals display its superior energy in a number of lines over the spacss between them; and in longitudinal animals, a longitudinal axis exceeds all others in extent and importance. In the higbest animals, its results ars much mors evident at one extremity of the axis (head) than at the other, and the diverging lines are rsduced to four (ths limbs). In each species, the movements of this force are uniform and habitual, and it is evident that the habit is so deeply-sated that only a very strong dynamic interfsrence can modify or divert it. What is ths modifying forcs? And how is it introduced?

The characters of living beings are eitber adaptive or non-adaptive; they are either machines especially fitted to meet ths peculiarities of their environment, or they are not. Among the latter may he ranged rudimental structures and also many others of no sufficient use. They ars all dus eitber to excess or defect of growtb force; they are either consequences of a removal of nutritive material to other portions of the hody; or they are dus to an excess of such material which renders an organ or part useless through disproportionate size. Of the former class may be cited the absence of the tail in soms monkeys and birds; also of the teeth in some cetaceans; of the latter kind are tbe enormous tusks of the mammoth, and the recurved superior canines of the babyrussa. The change of destination of this material has been probably due to the construction of adaptive machines whose perfection from time to time has required ths use of larger and largsr proportions of forcs and material.

In considering ths origin of adaptive structures, two alternative propositions are presented to us. Did the occasion for its use follow the appsarance of the structure, or did the need for tbe structure precede its appearance? The following answer to the question has always been the most intelligible to me. Animals and plants are dependeut for existence on their environment. It is an everyday experience that changes in environment occur without any preparation for them on tbe part of living things. If the changes are very great, death is the result. It is evident that the influence of environment is brought to bear on life as it is, or bas besn, and that special adaptations to it on their part must follow, not precede changes of climate, tópography, population, etc. We bave another important consideration to add to this one, viz.; the well-known influencc of use, *i. e.*, motion, on nutrition. Exercise of an organ determines nutritive material to it, and the nervous or other influence wbich does tbis, equally determines nutritive material to localities in the body to wbich an effort to move is directed, whether an executive organ exists thers or not. Tbe habit of effort or use dstermining the nutritive habit must be inherited, and result, in the growing young, in additional structure. Change of structure, denied to tbe adult on account of its fixity, will be realized in the growing or plastic condition of fœtal or iufant life. The two considerations here brought forward lead me to think that the cause of acceleration, in many adaptive structures, is environment alone, or environment-producing movements, wbich in turn modify structure. Tbe character of the stimulus in the successive grades of life may be expressed by the following table, passing from the lowest to the highest:

1. Passive or motionless beings;
   by climate and food only.
2. Movable beings;
   by climate, food and motion.

By motion either;
a, unconscious, or
aa, conscious, wbich is,
b, reflex, or
bb, directed by desire without ratiocination, or
bbb, by desire directed by reason.

The only general rules as to the direct influence of motion on struoture which can be laid down at present are two, viz: That density of tissue is in direct ratio to pressure up to a certain point;* and that excess of growth force in a limited space produces plications of the surfaces stimulated.† These and otber laws, yet unknown, bave probably led the changes expressed by evolution, wbile many otbers bave followed tbe disturbance of equilibrium wbich tbey have produced.

I here allude incidentally to tbe question of transmission or inheritance. It has been maintained above tbat the batbmic force of each species is different from tbat of all otber species. This force is characteristic of some unit of organization of living beings; and tbis probably consists of several molecules. This unit bas been termed by Haeckel the plastidule. The transmission of tbe bathmic force of one generation to another would be effected by the transmission of one or more living plastidules; and tbis is probably precisely wbat is accomplished in reproduction. The *Dynamic Theory* of reproduction I proposed in 1871,‡ and it has been since adopted by Haeckel under tbe name of perigenesis. I compared tbe transmission of bathmic forcs to tbat of tbe phenomenon of fire, which is a force-conversion transmitted from substance to substance by contact. Tbe theory of pangenesis, devised to explain the pbenomenon of reproduction, is to my mind quite inadequate.

III.—Metaphysics of Evolution.

I enter bere upon a wide field, over wbich I can only skim on an occasion like the present. Tbs subject has been already introduced by reference to consciousness as modifying movemsnt. The word consciousness was then, and is now, used in its simplest sense, viz: as synonymous with physical sensibility. Its lowest and most usual exhibition is ths sense of touch; the special senses, taste, sight, etc., ars higher forms, while thoughts and desires ars organized products of the same raw material. Consciousness cannot be denied to many of the inferior animals; indesd, if we grant it to any, we must admit that it is displayed at times hy even ths lowest *Protozoon*. That these humbls creatures should possess it, is apparently quite as probable as tbat the equally simple and very similar bioplasts of the brain of man should be its seat.

Consciousness alone is not a sufficient basis for the development of mind. For this, one more elemsnt is necessary, and that is, *memory*. Impressions made by the environment are registered, and soon cease to be present in consciousness. Under the influence of association the impressions return to consciousness. Associations ars those of place, of the order of tims, and of similarity or differences in various qualities, as size, color or any otber physical features. Experiences of these qualities are to all conscious beings either painful, indifferent or pleasurable. Whsn association requires, events, objects or characteristics, are returned to consciousness in the order in which they cohere most firmly in tbe mind, wbich may or may not bs tbat in which they entered it. The liking for or dislike to the object, are equivalent to an attraction to or repulsion from it. Tbus experiences is begotten: as its material increases new combinations are formed, new relations observed, and in the highest types of mind laws are discovered. No one can deny memory to animals; it is the medium of their education by man, and has been as well tbe means of their education hy nature. It doubtless causes a re-arrangement of certain elements of structure which give the form to consciousness when it arises again. It is also probable tbat thess elements are not the same as tboss which register classifications and conclusions, but that nevertheless the arrangement or organization of these is determined by the simpler arrangements of the perceptive elements. Experiencs produces these combinations in tbe bioplastic aggregations of all animals, be they in the form of ganglia, brains, or less specialized forms. Nowhere in the human organism ars the effects of effort and use so strikingly witnessed as in the increase of brain power; and familiarity with the education of the lower animals shows tbat this is the case with them also, though in a lesser degree.

If, then, we grant the propositions, first, that effort and use modify structure; and second, that effort and use are determined by mind in direct ratio to its development, we are led to the conclusion that evolution is an outgrowth of mind, and that mind is tbe parent of the forms of living nature. This is, however, to reverse a very usual evolutionary hypothesis, viz., that mind is the product and highest development of the universe of matter and force. The contradiction is, however, not so absolute as at first appears. By mind, as the author of tbe organic world, I mean only the two elements, consciousness and memory. But it is the view of some tbinkers that consciousness is a product; that it is not only a correlative of force, but a kind of force. To tbe lattsr tbeory I cannot subscribe; when it becomes possible to metamorphose music into potatoes, mathematics into mountains, and natural history into brown paper, then we can identify consciousness with force. The nature of consciousness is such as to distinguish it from all other tbinkable things, and it must be ranged with matter and force, as tbe third element of the universe.

It is true that unconsciousness does not imply absence of life as generally understood. A majority of the processes of life are performed unconsciously by living creatures; mind itself being no exception to this rule. There is another class of acts whose performance produces sensation, but consciousness is not concerned in tbem as an immediate cause. Therefore, it is a common endeavor to associate reflex and unconscions acts witb the molecular movements of inorganic and non-living substances. But tbs one great difficulty in making this identification bas never been surmounted. Tbis is the different nature of the movements in the two cases. In non-living matter they ars simply polar, notbing more. In living beings they display design. Perhaps I use the word "desiga" in a new sense, but the expression is nevertheless appropriate. What I msan is, that the movements of living things bave direct reference to consciousness, to the satisfaction of pleasures, and to the avoidancs of pains. The *molecular* movements witbin animals of the simplest class are tbe digestion of food and tbe elaboration of tbe matsrials of reproduction. The *molar* movements of the simplest animals are to enable them to escape tbs pains of hunger and celibacy. Moreover tbere is reason why the movements of living bsings display design. We all know the naturc of habits; how tbey are performed unconsciously, and as automatically as digestion itsslf. But did any one ever know of a habit in an animal, wbose origin be could trace, which bas been formed in nnconsciousness? According to our knowledge tbey ars always the result of stimuli which are consciously felt, and which cause hy repstition or by reminiscence a repetition of the resulting movement. After a sufficient number of rspetitions such an act becomes a habit, *i. e.*, is performed automatically, or without the intervention of effort, and frequently without consciousness. It thus becomes a part of the character of the individual or species. Tbis common phenomenon is explained by tbs hypotbesis tbat an organization of the centers controlling action is caused by the efforts of the animal under ths stimulus, and tbat finally a machine is constructed which determines ths nature of the force expended, without further mental exertion of ths individual. Such a process is education, and the result is an acquisition to tbe stock of faculties already on band. Thus is explained the vast numbsr of automatic and unconscious activities displayed by animals; to the same source, I belisvs, the common reflex acts may be traced; it even appsars to me probable that tbe organic functions in general have had ths same origin.* While tbese lattsr have mostly long since passed beyond the control of ths mind, portions of the urogenital functions still linger within ths confines of its jurisdiction. Tbus have consciousness and mind endowed living nature with useful functions; and this, which may be called the *Theory of Endowment*, accounts for ths element of design wbich is so puzzling when seen in unconscious and reflex acts.

As it has been maintained abovs that structurs is tbe effect of tbe control over matter exsrcised by mind, it is evident that the evolution of mind must be directly followed by corresponding development of organism. The science of paleontology substantiates this theory in a wonderful manner. But ths animal mind bsing generally occupied with simple functions, its expressions in structure ars nsually notbing more than the progressive creation of improved instruments for obtaining food, resisting climate, escaping enemies and reproducing tbeir kind. The struggles of animals have been on this platform, and mind has only been necessary to aid in accomplishing the ends above mentioned. Wonderfully effective machines for grinding, cutting, seizing and digging; for running, swimming and flying have been produced. The development of mind proper must appear in the size and structure of the brain; and though the bistory of the latter in past ages must always remain in large part hidden from us, it is known that in tbe former respect tbere has been great progress made in various lines of animals. Now ths line which has carried brain to its present development in man, the *Quadrumana*, has been deficient in special mechanical excellencies of ths kind enumerated above. Perhaps inferiority in these many respects has kept the *Quadrumana* under greater mental tension, and compelled them to exercise deliberation in tbeir acts and give tbat opportunity to thought which was less demanded in tbe case of otber animals. Furtbermore, if they are less specialized in tbeir mechanism than most other *Mammalia*, tbsy are less restricted by it to peculiar modes of life. They are more versatile, and more capable of the adoption of new habits as a consequence. And here we have a glimpse of a most important principle in evolution which is the keynote to its method; tbis is wbat I have called *The Doctrine of the Unspecialized*.

Paleontology shows that tbe succession of living types has not been in a single straight line. It has been in many divergent lines, and a large number of them have not continued to the present time. The history of life has been well compared to a tree with divergent branches, many of which do not reach tbe elevation of tbe summit. Furthermore, in the many cases in which we can trace the lower lines to the present period, it is evident that in their present condition tbey could not have given rise to the higher forms. Each line, in fact, bas developed to an extreme of specialization of structure, which it would seem is incapable of modification in any direction very divergent from tbat which it has already taken. Much less have such specialized types been able to survive the environment for which they were designed: with important changes in that respect they have perished. A few examples will serve to illustrate my meaning. The direction of devsl-opment has been from fishes, through *Batrachia* and reptiles, to birds and mammals. But we cannot derive any living typs from the osseous fishes of the present or past ages *(Hyopomata)*; to find the origin of *Batrachia*, we must pass below tbese to more generalized and older forms, tbe *Dipnoi*, a class whoss position in the system was for years a controverted point. We cannot obtain *Mammalia* from any of the existing types of reptiles, but we must go back to tbe Permian period, and tracs tbeir outlines in tbe *Theromorpha* of that day. In spite of the prophetic resemblance of these remarkable animals, they ars inferior to later reptilia in the structure of their vertebral column, and display resemblance to some of their immature stages, as well as to thoss of tbe *Mammalia*. Among mammals we cannot derive monkeys from *Carnivora* or *Ungulata*, nor ths latter from each other, but can only trace tbeir close approximations in tbe Bunotherian types of tbe lower *Eocene*. So with tbe great divisions of *Ungulata*, *Proboscidians*, *Hyrax*, and tbe even and odd-toed orders must all be traced to tbe unspecialized *Amblypoda*, with small brains and five-toed plantigrade feet, as their ancestors.* It is easy to perceive that the generalization and plasticity of all these forms has furnished tbe ground of their ancestral relation.

We are now in a position to comprehend more clearly the general nature of evolution. Tbe doctrine of the unspecialized teacbes that the psrfection produced by each successive age has not been the source or parent of future perfection. The types wbich have displayed the most specialized mechanism have either passed away, or, undergoing no change, bavs witnessed tbe progress and ultimats supremacy of those who were once their inferiors. This is largely true of animals which havs attained great bulk. Like tbose with perfected weapons, they have ever been superior to tbe attacks of other animals in their day, and doubtless led, so long as food abounded, lives of luxurious indolence. With change or diminution of food, such huge beasts would be ths first to succumb, and it is a fact that no type of animals bas maintained great size through many gcological changes. It is trus that all of the lines of ancestry of tbe sxisting higher mammalia, as the subdivisions of ths *Carnivora*, *Ungulata* and *Quadrumana*, wbich we know in detail, commenced with types of small sizs and insignificant muscular power.

Soms important conclusions may he derived from wbat has preceded. It seems that evolution has witnessed a continual runuing down of types to tbeir great specialization or extinction. That many typss have arisen in weak and small beginnings, but that ths conflict witb mors powerful forms bas developed some qualities in wbich they sooner or later excelled, and wbich formed tbe basis of tbeir future superiority and psrsistence. Tbat while tbis has probably been the true cause of the origin of the many admirable mechanical adaptations displayed by animals, it is pre-eminently trne of the development of mind. That the reason why progress has reached its limit in the lines of greatest specialization, has probably been the removal of the occasion of its original cause—*i. e.*, active exercise in the struggle for existence. This explanation is suggested by the remarkabls degradation which is witnessed in animals whose mode of life relieves them from ths necessity of working for a livelihood, *e. g.*, the parasites, and sessile animals, whose young are free. Some of these creatures, on assuming their parasitic life, lose tbs semblance of even the order to which their young belong. The primary stages of various plants move actively tbrough the water like the lowest forms of animals, and their sessile adult condition must be looked upon as a degeneration. It is well known that the endeavor to relegate ths lowest forms of life to tbe two kingdoms of animal and vegetable bas been generally abandoned. Tbe great vegetable kingdom probably exbibits a life degraded from more animal-like beginnings. Animal irritability and mobility have been lost, and tbeir own consciousness must he entirely eliminated from tbe question of tbe origin of the many later and specialized types of plants. But I venture here the hypothesis that the consciousness of plant-using animals, as insects, bas played a most important part in modifying tbe structure of the organs of fructification in the vegstable kingdom. Certain it is tbat insects have been effective agents in the preservation of certain forms of plants. I would suggest wbether the mntilations and strains they have for long periods inflicted on the flowering organs, may not, as in some similar cases in the animal kingdom, have *originated* peculiarties of structure.

Evolution of living types is then a succession of elevations of platforms on which succeeding ones have built. The bistory of one horizon of life is, that its own completion but prepares tbe way of a bigher one, furnishing the latter with tbe conditions of a still furtber development. Thus the vegetable kingdom died, so to speak, that the animal kingdom might live; having descended from an animal stage to subserve the function of food for animals. The successive types of auimals have first stimulated the development of the most susceptible to the conflict of the struggle for existence, and afterwards fnrnished them with food. Doubtless in the occupation of tbe world's fields, tbe easiest and nearest at hand bave been first occupied, and successively those which were more difficult. The digging animals are generally tboss which first abandoned the open field to more

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* See *Penn. Monthly*, 1872.
† "Method of Creation," Philadelphia, 1871.
‡ "Method of Creation," 1871.

*Consciousness in Evolution. *Penn. Monthly*, 1875.

*See the origin of types of *Mammalia educabilia*, *Journal Academy Philadelphia*, *1874*. This view was subsequently expressed by Huxley.

conrageons or strongor rivals; and they remain to this day generally of low type compared with others of their classes *(e. g., Monotremata, Rodentia, Insectivora)*. All occupations havo been filled before that one which requires the greatest expenditure of energy—*i. e.*, mental activity. But all nther modes of life havs fallen short of this one in giving the supremacy over naturc.

Automatism theu represents a condition of "lapsed intelligence" and diminished lifo. The unconscious automatism of auimals is .a condition of still greater lapse. On tho contrary, sensibility is the coudition of development, and the susceptibility aud impressibility which is the extreme reverso of automatism is the especial character of youth. Here the "doctrine of the unspecialized" finds justification again.

What the futuro hae in store for us in the history of inorganic force and its results we can not nnw forssee, hut I call attention in this connectiou to the important part played by life in tho distribution of minerals. It has long heen known that the carbon of the earth's cruet was once in a living etate, and it ie admitted that tho limestoue once circulated in the flnids of animals. We have recently been compolled to hclieve that siliceous rocks are composed of the consolidated shells of minutc plants, which they have olaborated from the water of tho ocean. Silver and gold are segregated and deposited by seaweeds. The principal rock material whose relation to life has uot been ascertained, is alumina. How far the processes which now charactcrize dead matter wero oncs rslated to life is a problem for the futurs.

IV.—The Morals of Evolution.

The doctrines of the struggle for existence and survival of the fit in human life, have a twofold application. The relative proportions in which these applications are made, will depend on ths moral dovelopmcnt of him who makes thsm. Moral density and ntellectual stupidity (often nearly allied) will see in these two laws ouly the struggle for material power, and the survival of thc strongest. They will hardly urge in these days, as they would infallibly have done hed they lived a few centuries ago, that the strongest means the hardest hitter, or the most successful assassin, but they will probably believe that this pre-eminent position belongs to the most wealthy. From a purely dynamical standpoint this position is correct, yet it might be a useful question for such advocates to consider, why it is that physical oppression and assassination should he less successful avenues to power than they oncs were.

There are two reasons why man does not grant the first place in his esteem to physical force. The first principles of morale are acquired in the struggle for existence. The idea of *meum* and *tuum* was speedily developed so soon as men associated together; and the habit of justice has douhtless heen formed by the insiatence of every man on hie own rights, and hy the power of combinations of mcn to control those who may from euperior strength or other cause seek to violate the rights of property. Thus law originated, and from the earliest history of the race to the present day it has educated the harbarous and semi-harharous to civilization. It is then easy to perceive that man gives the highest place in his affections to the *most just;* hut there is yet another reason why this should he the case.

The reproductive instinct in the lower animals has developed into social affections, and these form a part of the character of the higher animals and, in an especial degree, of man. The eentiments of sympathy and henevolencs are probably outgrowths of the same. While the rational faculties are concerned in the *knowledge* of right, these sentiments are a source of the *love* of right. This dispesition is trusted hy men as leading to the *practice* of right, in casee where the power to enforce it is not immediately present. The struggle for cxistence then among men ranges all the way from a rivalry of physical force, to a rivalry for the possession of human esteem and affection. The rohher and assassin of the lowest human races, are repreeented hy the slanderer and defamer in the higher. The ultimate prosperity of the just, asserted and foretold by prophets and peets, is hut a forecast of the doctrine of the survival of the fittest. The unjust are sooner or later eliminated hy men from their society, either hy death, seclusion or ostracism.

But the organized moral qualities cannot normally transceud in power, as motives of human action, those which secure his physical preservation. Lines of men in whom the sympathetic and generous qualities predominate over the self-preservative mnst inevitahly hecome extinct. Evolution can produce no higher development of the race (whatever may sometimes appear in individuals), than an equivaleucy in these two classes of forces. Beyond thie the organization of the social faculties of the brain must always he repressed in the race, so that we can only expect to attain an equilihrium hetween them and the more purely selfish ones, as the very highest result of unassisted evolution. In this position the judgment is suspended hetween the opposing classes of motives; and it must ever remain douhtful in general, as to whether resulting action will he just and right, or the reverse. I exclude from this qnestion thoee generoue acts which do not appear to the actor to conflict with eelf-interest. These may he termed *sympathetic* acts, and are qnite dietinct from the altruistic. The symnathetic actions are een at timee in most animals. The altruistic acts on the other hand, are thoee that expree what is ueually called "moral principle." Such acts may often ooincide with the interest of the actor, but so long as they do so, they are altruistic. It is part of the doctrins of evolntion, that habits will ultimately disappear nn the removal nf their stimnlating cause. The moral nature originated, and has been maintaiued, through the pressure of the fear of consequences. The removal of this pressuro, through the acquisition of power, will ultimately result in the dimiuution or loss of the moral nature, through dieuse. The abuscs of power ars well knowu. This appears to hs all that evolution cau do for us in the production of the moral naturs. It nnst he admitted that uo organized faculty of *self-sufficient altruistic justice* cau be derived by ths process of mental evolution. It is evideut that any power which shall cause the permauent predominance of the just over the sclfish faculties must he derived from without.

After we omit from customery religion coemogony, which belongs to scieuce, and thcogony, which belongs to tho imagination, we have left an art which has for its object, the developmeut and sustentation of good worke or morals among men. If the teachers and professors of this art produce ths results in this direction at which they aim, their great utility muet be conceded by all. Their method has the advantags over that of the law, in being of the character of inducements supplied before action, iuetead of pains and penalties inflicted after actiou. They strive to *originate* good couduct, rather than to punish bad condnct. They are working on the eide of the *originative* force in development, rather than the destructive; the "*origin of the fittest,*" rathor than the "*survival of the fittest.*" Whether man possessee the spontaneous power called "free will" or not, the work of supplying inducements for good condnct ie most useful to society. But religion, as generally understood, pre-supposes free will; and the definition of the word responsihility implies its existence. The question as to the preasnce of such a faculty is an interesting one, and will now he briefly considered.

Thc well-known doctrine of necessity leaves no place for free will. All acts are the consequnces of motives, and are the outcome of a halancing of interests. The heaviest side of the account determines action. Our physical necessities supply the motives for moet of our activities; our pursuit of food and clothing is of necessity, and no choice is free from it. Evolution supports and explains this doctrine, as can readily he perceived. It derives our intincts from an ancestry whose daily occnpation hae been their gratification. But it has been shown above that this development does not supply the motives of an independent morality.*

The direction of action under stimnlus is determined hy intelligence, which is, as has heen above maintained, the product of experience. Intelligence is organized or classified knowledge, and directs the activities set on foot by the likes and dielikes, that is, the affections. When there is knowledge there is no necessity for epontaneons action or free will, since action is determined hy the organization of the mind. If the mind is conscious of insufficient knowledge, an inducement to seek knowledge ie eupplied, and according to the result of investigation will he the direction of knowledge.

But we are here brought to face the case where knowledge cannot he, or is not, obtained. Thie is the condition of the two questions of the practice of morals and the nature of the future life. The evolution of mind consists of a continual advance from the known into the unknown, and a transfer of the unknown to the known, and so long as there is any inducement to progress of this kind, and nature responds to inquiry, development will go on. Although it is true that it ie only among men, and hut few men at that, that the pursuit of knowledge is an occupation, most men add to their etock incidentally as they pursue other avocations. The knowledge of right and the inducements to its practice are learned in their every-day intercourse, eo far as it can he acquired. But it is in this field that knowledge soon attains its limit, and accordingly development dependent on knowledge must cease. If any further progress is to he made some new force must intervene at this point.

Here is the opportunity for the appearance of will or spontaneity; here it is at least needed. I am willing to helieve that it appeare at this point, and that so long as we have to face the unknown in moral progress, so long it will remain. Probahly if organized as a faculty it may always continue, even after much of the unknown may have heen conquered, and a etationary period may have ensued. Such an accession to character would he a fitting crown of evolution, and a justification of this lahor of the ages. If a true factor in human development, it might he compared in the creation of character, to the apical of a growing tree. As the part pre-eminently living, it leads the growth of the trunk aud hranches. They all follow of necessity the path it has marked out. Under its lead they are successively formed, become fixed, and finally decay.

* On the Origin of the Will. *Penn. Monthly*, 1877.

It is estimated that not loss than 28,000,000 tons of anthracite coal will he required to supply the demands of the market in 1880. To produce this immense quantity will keep the mines husy during the entire year, requiring a production of more than a half a million tons a week.

Useful Information.

How to Judge of Leather in Belts.

Without entering into the question of the merits or demerits of rubber or other kinds of helting, one cannot hut uotice the want of unanimity of opinion, even amoug belt manufacturers, as to what really constitutes the hest leather for making belts to convey power iu running machinery; and, if we includo makers of belts on the other side of the Atlantic, the differencee in theory and the divergence in practice are much wider than they aro hero. As a rule, too, this is a matter about which machinists generally have hnt little information, and are, with here and there only a raro exception, hut indifferent judges.

The hest helt, theoretically, is that which combines tho highest tensile strength with the greatest power to resist wear by attrition, heing at the eame time subject to little change hy dryness, moisture, heat or cold. These qualities, supposing the manufacture to he ordinary good, are mainly dependent npon the tanning. In Europe there is very little difference known or acknowledged between good sole and good belting leather. The heaviest or "plumpest" leather is usually considered there the hest for helts, as well as for the solee of hoots and shoes. Our belt makers, however, recognize an essential difference. The sole of a hoot or shoe, particularly in all heavy work, needs to have but little flexihility, hut must have the greatest possihle capacity to resist wear by attrition, and he ae far as practicahle, impervious to water, while it is never enhjected to any test of ite tensile strength.

Sole leather, therefore, in all the toughest wearing grades ie made as thick and solid as the tanner can make it; great care is taken to open wide the peres of the hide, in the early part of the tanning process, see that all the gelatine is saved to combine with tannin, and that the hide is left in the tan liquors long enough to take up all the tannin it will absorh. This makes the finished leather oftentimes a great deal thicker than the original hide. But such leather, it need hardly be said, would not he the hest for making helts, for it has little flexihility, and its tensile strength has heen greatly impaired hy thc straining of the fihers of the hide to take in the large amount of tannin it has received.

The tanner who would make the hest belt-leather, however, although he cannot swell the fihere of the hide with tannin to the extent ahovs noted, must produce a firm, solid helt with not a little of the elasticity and strength of steel; it must he sufficiently flexihle, and yet of great power to resist wear hy attrition, and to stand, with little etretching, the heaviest direct strain. These qualitiee are best ohtained by an amount of tanning which will make the finished leather hut little thicker than the raw hide of which it is made. On cutting a piece of sole or helting leather, one will notice the network of hide fibers interlacing each other, and which, before tanning, were surrounded with gelatine. These fihers give the hide its great tensile strength, and any considerable displacement of them hy the transformation of the hide into leather impairs this quality. A piece of good helt leather, therefore, when freshly cut, should look hright, with the intervening spaces hetween the fihers fine, even and regular. The texture shonld he nniform throughout, and with the utmost eolidity there should he great elasticity.

Peculiarities of Rapid Motion.—If a musket hall he fired into the water it will not only rehound, hut be flattened; if fired through a paue of glass, it will make a hole the size of the hall without cracking the glass; if the glass he suspended hy a thread it will make no difference, and the thread will not even vibrate. When a tallow candle is loaded in a musket and fired at a hoard of not too hard a wood, it will make a hole in the heard. If a round disk of naper is turned very rapidly on a lathe, its edge will cut the fingers like a knife; and if such a disk of sheet iron is turned with eufficient velocity, it will even cut steel.

Testing Cellars for Dampness.—Provide yourself with a thermometer, a glass tumhler filled with water; and a piece of ice; then notice how low your thermometer, when placed in the tumhler, has to sink before any moisture hegins to show itself on the outside of thc vessel of cold water. The lower the temperature to which the thermometer has to sink before moisture is precipitated, the less there is of it in the moisture of the cellar.

New Kinds of Plated Sheet Iron.—In Iserlohn, Westphalia, thin sheet iron ie plated with alloys of nickel, or cobalt and manganese. A half of one per cent. of mangancse makes cohalt and nickel very malleahle, fluid when melted, and ductile. The plates, which are already in the market, are heautifully white and brilliant.

To Remove Old Paint.—Slake three ponnds of stone quicklime in water, and add one pound American pearlash, making the whole into the consistence of paint. Lay over the old work with a brueh, and let it remain for from 12 to 14 houre, when the paint is eaeily scraped off.

To Remove Ink Stains.—Wash carefully with pure water, and apply oxalic acid; and, if the latter changes the dye to a red tinge, restore ite color by ammonia,

Good Health.

Cause of Drunkenness.—Dr. Jackson expresses the opinion that one of the mest common inducements to ths uso of alcohol, is that people overwork themselves, and heiug eo exhausted that they cannot sleep, resort to smoking, chewing and alcohol drinking. This may somctimes be the case, but we can testify to having learned hy observation that men do not become drinkers hecause they cannot rest, but because instead of devotiug their leisure hours to useful reading and proper entertainments, they epend them in driuking ealoons among dissipated companions, or they drink at home to kill time. When a mau is fatigued from hodily labor, all ho has to do is to keep his mind occupied with reading, or have others read to him, and he will soon feel eleepy. Ths kind of reading has, of couree, much influence, and a man must learn hy experieuce what kind of literature will keep him awake, and the sort that will cause him to sleep.

Table Salt an Aperient.—Phyeicians have for a long time known that common tahls salt is an efficient aperient in ordinary cases of constipation. In a lecture on a casc of nervous affection, Dr. Weir Mitchell, of Philadelphia, said that he had recommended the patient to take sach morning on rising a tumhlerful of water—cold, to prevent nauseating—in which was dissolved a teaspoonful of tahle salt. "This simple aperient," the doctor adds, "I frequently employ in cases of constipation, and generally find it efficient. There is great advantage in etarting the howels and in kceping them in a soluhle condition, particularly in cases of nervous dieordcr in women, as it eometimes clears up obscure poiuts in the casc, and at all events eliminates ono sourcc of error."

How People Get Sick.—Eating teo much and too fast; swallowing imperfectly masticated food; using too much fluid at meals; drinking poisonous whisky and other intoxicating drinks; repeatedly using poison as medicines; keeping late hours at night and slecping late in the morning; wearing clothing too tight; wearing thin shoes; neglecting to wash the hedy sufficiently to keep the pores open; exchanging the warm clothes worn in a warm room during the day for costumes and exposure incident to evening parties; compressing the stomach to gratify a vain and foelish passion for dress; kceping up constant excitement; fretting the mind with herrowed troubles; swallowing quack nostrume for every imaginary ill; taking meals at irregular intervals, etc.

The Medicine of Sunshine.—The world wants more sunshine in its dieposition, in its business, in its charities, in its theology. For ten thousand of the aches and pains, and irritations of men and women we recommend snnshine. It eoothes hetter than morphine. It stimulates hetter than champagne. It is the hest plaster for a wound. The good Samaritan poured out into the fallen traveler's gash more of this than of oil. Florence Nightingale used it on the Crimean hattlefields. Take it into all the alleys, on hoard all the ships, hy all the sick heds. Not a vial full, not a cup full, but a soul full. It is good for spleeu, for liver cemplaint, for neuralgia, for rheumatism, for failing fortunes, for melancholy.

Nervous Failure.—When men do not die of some direct accident of disease they die, in nine cases out of ten, from nervous failure. And this is the peculiarity of nervous failure—that it may he fatal from one poiut of the nervous organism, the rest heing sound. A man may, therefore, wear himself out by one mental exercisc too exclusively followed, while he may live through many exercises extended over far greater intervals of time and involving more real lahor if they be distrihuted over many seats of mental activity.

Onions as a Medicine.—A correspondent of an English agricultural journal says that onions are a poison for worms, and that a dish of hoiled onions given to a child suffering from worms will kill them. Another correspondent maintains that they are the best remedy for rheumatism, eithcr cooked or raw, while a certain medical man says that hoiled onions are good for a eold in the chest. We are glad to hear all this, and hope it may he true and verified hy further experiments so that onione will at least be good as medicine if not for food.

Sanitary Errors.—It is a popular error to think that the more a man eats the fatter and stronger he will hecome. To helieve that the more hours children study the faster they learn. To conclude that if exercise is good, the more violent the more good is done. To imagine that whatever remedy causes one to feel immediately hetter is good for the system, without regard to the ulterior effects.

Disinfectant for the Breath, etc.—A very weak solution of permanganate of potash is an excellent disinfectant for light purposes, euch as rinsing spittoons, neutralizing the taint of diseased roote of teeth, cleansing the feet, and keeping the hreath from the odor of tohacco smoke. Permanganate is not poisonous.

A Simple Chest-Protector.—A folded newspaper placed over the cheet ineide the vest, on going out during cold weather, constitutee an excellent protector for the lunge.

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The Week.

Another cold wave is sweeping over the country, and as is usual with very low temperatures, it has a depressing influence upon business and industrial circles, which will be but temporary.

There is a general advance in prices of merchandise, wares and metals, which indicates the approach of more prosperous times and a revival of financial and business confidence.

The directors of the Central Pacific railroad have made heavy sales of their stock, and the public impression is that they contemplate withdrawing from it by future sales of the balance of the stock in their hands.

There is an increasing interest manifested in mining properties both on this coast and in the Eastern cities. Attention in the latter circles appears to be attracted at present to Colorado, New Mexico and Arizona, and large investments are being made in the mines located there. New and valuable discoveries of gold ledges in our own State have been made, which will add to its already high character as a gold producer. The rich output of the mines at large, combined with the practical application of business economy and management in their development and working, are convincing capitalists that this field for investment is really the most desirable one that is open for future efforts.

DR. GEORGE LITTLE, the State Geologist, says that a yield of $10,000,000 worth of bullion might be produced in Georgia every year without exhausting the ore within this or the next generation.

THE bottom fell out of a lead mine in Iowa a short time ago. Two men named Foster and Morgan had just left the working when it sunk into a subterranean lake.

THE work of laying steel rails in place of iron ones on the California Pacific from Davisville to Suisun has begun.

THE German government proposes to levy a tax on advertisements in newspapers.

A Proposed State Mineralogist.

The Committee on Mines and Mining Interests of the Assembly has transmitted letters to Henry G. Hanks, William Ashburner, Melville Atwood and Hamilton Smith, soliciting their responses by letter to the following questions: First—Do you think that the establishment by law of an office, to be known as the State Mineralogist, would tend to the advancement of the mining interests of California to a sufficient degree to justify the cost of the maintenance? Second—If yes, will you please favor the committee with your views in relation to what by law should be made the scope of such an office, and somewhat in detail the duties of its incumbent? Third—What steps should be taken by the Legislature to secure the early preparation of such a report as that referred? Should this office be created simply until a report could be made, or should it be permanent, with a yearly report? The gentlemen are requested to transmit any other suggestions which occur to them.

We have also to suggest that others in the mining community, who have given this subject thought, should express their views as well. We should be glad to receive from any practical miners their opinions on the subject, and will publish such letters and afterwards see that they are brought to the attention of the members of the Committee on Mines and Mining.

If such an office were created, and the incumbent a good, practical men having the interests of his task at heart, no doubt much benefit would result. If some mere politician, with no special fitness, were appointed, the office would be of no use at all to the people. There are questions coming up every day which the State Mineralogist would be called upon to determine, and he should be a thoroughly competent man, who would try and make the results of his labors of some value to the mining community.

The Wiegand Amalgam Refining Process.

In our issue of Dec. 20th we printed a paper of great value to the producers of base bullion from the pen of our townsman, E. N. Riotte, setting forth the results and rationale of a very simple process for refining base bullion while it is yet in the form of amalgam, the costs of which, *exclusive of power and steam for heating*, appear to be a shade short of two per cent., while the saving of discount on sale of bars is four to five per cent.

Elicited thereby, to-day we print a communication from Conrad Wiegand, Esq., now the leading public assayer at Virginia City, Nevada, in former years well known in this city as the superintendent of assaying at our U. S. Mint.

We commend it to the perusal of practical millmen, whether their amalgam is produced base or fine, but especially to those whose amalgam contains but a small amount of gold, so small as often to be ignored in assaying, because the costs of parting (separating) it from silver exceed its value, whereas, under the new system it does not.

It is evident that at no distant day, when Mr. Wiegand's Edison-like patience—patience alike with people and with perplexities—shall have fully perfected results, which in the gross and outline he has already silently achieved, it is evident that his exceedingly simple process is destined to supersede acid refining and parting upon several grades of silver, which have hitherto called for dissolving the whole silver, *and with it base metals also*, in acid, so as to allow the insoluble gold to settle to the bottom of the dissolving pots, whence it is collected, washed "sweet" from acid, melted, minted or sold.

It is equally evident that the Wiegand method must soon affect the price of bluestone favorably to those who can obtain from him a license to use his process; while at the same time the increased use of bluestone (sulphate of copper) for refining lead-base amalgam, as well as for "basing" the amalgam yield of slimes and tailings must increase its price to the general consumer.

We feel a more than ordinary interest in the success of this process, for the simple reason that the MINING AND SCIENTIFIC PRESS Patent Agency, has conducted his numerous patent cases for years. How comprehensive and inevadible the claims are which have been granted, largely due it is true to his own critical ability in handling the English language, our readers can infer from a circular recently issued, which we reprint less as a characteristic than as a model document. It is designed to warn foundry-men, millmen and others against an apparently contemplated infringement. This circular reads as follows:

VIRGINIA AGENCY OF THE NEVADA AMALGAM REFINING CO., December 1, 1879.

To George M. Jennings, Esq.:—Your attention is hereby specifically called to the following facts:

1. The Nevada Amalgam Refining Co. is incorporated under the laws of California, and has an agency at Virginia City, Nevada.

2. Said company is now the owner of certain patent rights, which secure to it and to its licensees the exclusive right, *by means of any possible machinery, apparatus or implements*, to do the following things:

First—To refine silver, and separate it more or less completely from other metals than lead, by leaching its mercurially diluted amalgam out of (or away from) the amalgams of other metals, using mercury (warm or hot) as a filtering solvent, followed by a cooling of the filtrate and collecting therefrom the precipitated (or newformed) silver amalgam, whether by straining or by crystallization upon cooling surfaces, or upon obstructions fixed in channels through which the filtrate is made to flow. See patent 145,265, December 2, 1873, and re-issued June 23, 1874.

NOTE.—Mercurially to leach away the amalgam of lead (or of any other metal more soluble in mercury than silver is) from silver amalgam is not in contravention of this secured right, simply because leaching metals of the lead-base class away from silver, is the direct *opposite* of leaching silver away from metals of the copper-base class; and being far more obvious and facile of execution, has often been crudely empirically and imperfectly used, though never developed to an innocuous and systematic method; but the possibility of first dissolving a sufficient percentage of silver amalgam in mercury and then quickly effecting its precipitation, without at the same time *proportionately* effecting the solution and precipitation of amalgams of the copper-base class (making it possible to found a new system of refining thereon), was undiscovered till 1865 or 1866; and then only as the result of close study, toilsome experimente and considerable outlays. It was patented 1873.

Second—This company (and its licensees) also possesses or controls the exclusive right to feed in quicksilver *(for the purpose above set forth)* at the *top* of any vertically set vessel containing mixed amalgams, which vessel *while its sides are impervious to quicksilver* is furnished with a strainer at the bottom, thereby gravitatively securing the passage of quicksilver throughout the amalgam. Patent 145,265, re-issued as above.

Of course, if such a vessel were set so that its sides would be horizontal (one "side," viewed *gravitatively*, then being at the "top" and the other at the "bottom," while the strainer would then form one "side"), and if the quicksilver-feed were applied to the other end (or mid-way between two ends, each end having a strainer affixed), it would be a mere *verbal* evasion of this second recited right, and as such would be enjoined by the courts, as any other mere evasion would be.

However much superior to a vertical flow a lateral flow might prove (secured centrifugally or otherwise), so long as the sides of the vessel, *viewed with reference to the current of quicksilver passing through it*, are substantially impervious to quicksilver, while the current enters one end and strains or filters through the other (or, entering medially, strains at both ends or at a periphery) that method of using quicksilver in the United States *for the purpose set forth* requires a license from the Nevada Amalgam Refining Company to escape an injunction on the use of any such apparatus *for that purpose*, and to avoid a prosecution even if used, counterfeiter-like, secretly when the facts can be proven.

Third—This company and its licensees also have the exclusive right to maintain a leaching circulation (constant or intermittent) of the *same* quicksilver through heated amalgams for refining purposes, by means of which, without waste and without being itself consumed, a comparatively small amount of quicksilver, by successive increments, may refine a large amount of copper-base amalgam. Patent 145,265, re-issued as above.

Fourth—This company also possesses the exclusive right to a *gold*-refining process, which consists essentially of a *combination* of the silver-separating process above recited, with other steps which by themselves are not patentable, but the whole, constituting a new method, are; as is fully set forth by patent No. 168,695, October 11, 1875.

Fifth—This company and its licensees also possess the exclusive right to separate amalgams of *differing specific gravity* by causing their comminuted and disintegrated suspension in a vertically descending *current* of quicksilver, with or without the use of a top or bottom strainer; which current is so speeded as to overcome the slight gravitative tendency of silver-amalgam to float in quicksilver, but *not* sufficiently speeded to overcome the stronger tendency of heated copper-amalgam to float in quiescent quicksilver. See patent 196,848, Nov. 6, 1877.

Sixth—This company and its licensees also possess the exclusive right to *force* leaching quicksilver hot through amalgams, *in any direction whatsoever*, which amalgams have *not* been diluted (or "thinned up") by quicksilver, and whether by hydrostatic pressure, steam pressure, air pressure, by a pump, or by any other method of forcing such a flow. See patent No. 219,152, Sept. 2, 1879.

Seventh—This company and its licensees also possess the exclusive right to *construct, sell or use* for mercurially refining leaching purposes any leaching box or digester which embraces the following features:

A cavity in a box or vessel (of any desired form) enclosed between suitably supported straining cloths, into which cavity base amalgam is to be put for the purpose of refining it by mercurial leaching. Nor can any owner of *lead*-base amalgam lawfully use such a digester without first obtaining our license. See patent 219,152, Sept. 2, 1879.

3. The exceeding simplicity and economy of our methods and of our appliances for refining base amalgams, producing as they do silver free from gold, and *exempt from all mint* charges*, creates a powerful tendency with men either morally obtuse or reckless to imitate and seek to evade the company's rights; and although the terms on which they are offered to the producers of coppery amalgam are so low and exceedingly favorable, there is evidence going to show that an attempt to evade the company's rights is in serious contemplation.

In view of these facts, by authority of the President and Board of Trustees, I hereby notify you—

First—That any foundry or machine-shop whose managers shall knowingly construct or sell or use such a leaching box or digester as above described without license from this company will be dealt with according to the law for such cases made and provided.

Second—Any party who shall *buy* such a machine, unless licensed by this company to *use* the same, will be restrained by due process of law from using it, and will be sued for all provable damages and expenses of every kind arising out of the attempt; and, furthermore, HE WILL BE DENIED THE USE OF ANY OF OUR PROCESSES ON ANY TERMS WHATEVER, and in all PLACES whatsoever; so that while any honorable millman will be able by the cheap use of our processes to effect important savings in the sale of his bullion and be able to pay good prices for milling materiel, the attempting infringer will not be able to compete with him. This rule has been adopted in order to identify the interests of licensees with those of the company, AND WILL BE RIGIDLY ADHERED TO.

Third—As soon as it is possible for the subscriber to secure capital for the erection of bluestone works, such *payments* for copper will be made to the producers of coppery amalgam as will render the base metals which now enhance *discounts* on base bars a source of *profit* to their owners.

Alike, therefore, for right, for honor, for manliness and for self-interest, it is hoped that every producer of base amalgam, no less than every man of right impulses who detests piracy, will frown down in its incipiency the attempt to evade patents which have cost so much to a struggling man in the development of an overlooked principle into a useful process, promising so much of good to so many, and offered on terms so reasonable that it is difficult to conceive of thanklessness so cold as not to *want* to requite (by *self-helpful* business) a man who has strivenearnestly for the interests of silver producers, now that he has achieved a working success in an invention which he knows entitles him to the respect and good-will not only of bullion producers, but of all others whose business success depends on the continued running of mills in the production of bullion from the *wastes* of our mines. CONRAD WIEGAND.
Superintendant Nevada Amalgam Refining Company.

To the above we intended to add a communication just received from the inventor, whom we hope to see rise into the American peerage of the rich, for no one among all our friends seems more worthy, especially as such an elevation could not be declared the result of either the patronizing favor of the already wealthy, nor the luck of stocks. If attained at all it will be the unqualified result of the persistent use of a clear head, a hopeful heart, an indomitable will, all backed by a peculiar and almost amusing energy and wit, tireless as the tide themselves.

The crowded state of our columns compels us, at the last moment, to postpone publication of Mr. Wiegand's letter until next week. It will, however, "keep," and will speak for itself in our next number.

* Because it saves the Government the costs of purchasing copper to alloy coins.

SUCCESS OF THE BEAR RIVER UNDERCURRENTS.—Some months ago, Wm. H. Kinder, an enterprising miner, of Gold Run, Placer county, commenced the construction of an undercurrent on Bear river, several miles above Colfax, in which to collect the gold that ran to waste in the debris that flowed into that stream from the hydraulic mines adjacent thereto. This was the first construction of the kind on Bear river, although similar undercurrents have been used in other localities with success. We learn that Mr. Kinder's experiment has yielded unexpectedly large returns—the first result, after an 18 days' trial, being $600 in gold. At the time the work on the undercurrent was commenced its estimated cost was $5,000. Upon this cost the above return shows that the venture will be an exceedingly profitable one, yielding over $18,000 per annum.

VULTURE MILL.—Mr. Shipman has been appointed Superintendent of the Vulture gold mine and mill. Only 20 stamps are now running on Vulture ore. The mill is now known as the Central Arizona Co. mill. The Vulture mine will soon have an 80 or 100-stamp mill erected at the mine, to which water will be taken in 11 miles of six-inch iron pipe.

New Mining Enterprise in Siskiyou Co.

Siskiyou is an old mining county, and in many parts of it, particularly about Yreka, rich diggings have been worked. The country in that vicinity, however, is very flat, affording few opportunities for dumps, so the mining has been confined, to a great extent, to work with rockers, etc. Only the shallow deposits of top gravel have, therefore, been worked, and this class of work is going on to this day. All the patches of top gravel which were accessible have been mined, but the lack of fall has prevented any extensive hydraulic mining, as the lower gravel could not be got at.

Some years ago, this section was examined by capitalists, who proposed running a tunnel to cost some $100,000, but after spending several thousand dollars in a thorough investigation, they found that the tunnel, if made, would not open up enough ground to make it a paying investment; so that the enterprise was abandoned. A ditch, some 80 miles long, now furnishes water to the mines which are being worked.

The ground in the vicinity of Yreka creek has paid well as far as it has been worked, but no deep mining has been done there for this reason stated. A company has recently been formed in this city, however, under the style of the Yreka Creek Gold mining company, with 50,000 shares capital stock, to work the deeper part of the ground, intending to overcome the difficulty of lack of fall, by using the Cranston hydraulic elevator. The incorporators have investigated the merits of the machine, and in view of its success where introduced, are confident that the rich ground of the deep diggings of Yreka creek can be utilized.

They have purchased the big ditch, which has for many years brought in water for working the rich side creeks and slopes of Yreka creek, and have secured several miles of good ground, thus owning both water and ground. They are going to work in earnest, having set aside 15,000 shares of their stock as working capital, at $1.50 per share.

The upper ground has all paid well. A large amount of money no doubt remains, as the lower dirt has not been touched, nor could it without some such device as the Cranston elevator. Of course it would not pay to put up expensive pumping works to work gravel mines. The ground is about a mile and a half below Yreka, down the creek.

We saw this week at Joshua Hendy's shop, No. 51 Fremont street, which is the office of the company, the patterns of the large elevator which is to be used on this ground. It is a 20-inch machine, the largest yet made and is capable of taking what ground 700 inches of water will sluice down. Some of the water is brought back after lifting the gravel and used for washing it. With the pressure of water they have they expect to be able to work ground 35 or 40 feet deep.

We illustrated and described the Cranston elevator in our columns some little time since. It is set at any suitable point in the claim, below the surface, and by delivering a sufficient stream of water into it from above, the water and gravel are driven up hill by hydraulic force. An inclosed flume is made with an inclination upward, with a horizontal ground section made of cast iron. A hydraulic nozzle is introduced into this ground section, the nozzle being pointed in the direction the water is to go. This ground section has an open end back of behind the nozzle, where the water and gravel or material enters the machine. The open end is connected with the flume, placed in the bottom of the mine and the gravel is washed or driven into this flume in the ordinary way. At the opposite end of this ground section is connected the upward inclined closed flume, and also connected at its upper end with the flume to the top of the mine so as to discharge the material and water elevated into the flume on top. This machine is driven by the nozzle which discharges inside of the ground section.

It will be evident from the above, that if there is sufficient force exerted by the water discharged from the nozzle of the machine to drive it, that earth, sand, gravel, and rocks entering the machine must necessarily be carried along, and be discharged with the water into the flume on top. The water, gravel and material are made to travel through the machine at high speed by the direct action of the force exerted by the nozzle of the machine. All of the gravel and material comes in direct contact with the stream of water discharged from this nozzle, consequently it serves greatly to dissolve and pulverize all gravel that is hard and difficult to work. In this connection it may be stated there is no possibility of the gravel choking or lodging in the machine. The thing never occurs while the machine is working under pressure. The disintegration and washing process above alluded to, produced by the force of the nozzle of the machine, so thoroughly washes and dissolves the gravel in its upward passage through the elevator spout, that expensive long flumes for washing are not necessary, the gravel being washed better in a single passage through this machine than in traveling one mile through an ordinary flume. The machine is in use in a number of places in this State.

The Gould Process at Meadow Lake.

A short time since we gave a brief account of the results of a new process, introduced by Mr. Gould at Meadow Lake, a locality where the ores have been heretofore found impossible to work. Meadow Lake has been called the "bone yard of processes," so many having been tried there and failed. We received this week the following letter from a gentleman who gives us more of the details of the process than have before been published, and which shows some startling results. The statement is a plain and open one and will repay perusal:

EDITORS PRESS:—I have noticed articles in the PRESS several times concerning the working of the ores of Meadow Lake district, all of them being of such a nature as to cause a person unacquainted with the ore and our method of working it to doubt our ability to do what we claim and have done. Being deeply interested in the welfare of the district, and knowing your influence will do a great deal toward reviving interest in it, I make a statement of our work at Carlisle which is about seven miles from Meadow Lake and where the same kind of ore is found, Meadow Lake district embracing both which is a mistake. We had our ore assayed by Prof. Thomas Price, of your city, and after giving him the number of tons worked, he said he never knew of ore being worked to a higher percentage, we having worked it to nearly 95% of the assay value, realizing from a run of 13 tons $1,176.63.

The tailings assayed 2.07 in gold and 3.49 in silver per ton. The ore came from the U. S. Grant mine, and was worked in an 8-stamp mill having two pans and one settler. The engine has power enough to run but one-half the machinery at once, and having started late in the season, we could not run over one-third of the time on account of scarcity of water, and yet after paying all expenses of building a furnace, packing wood and provisions, we were enabled to declare a fair dividend after crushing 20 tons.

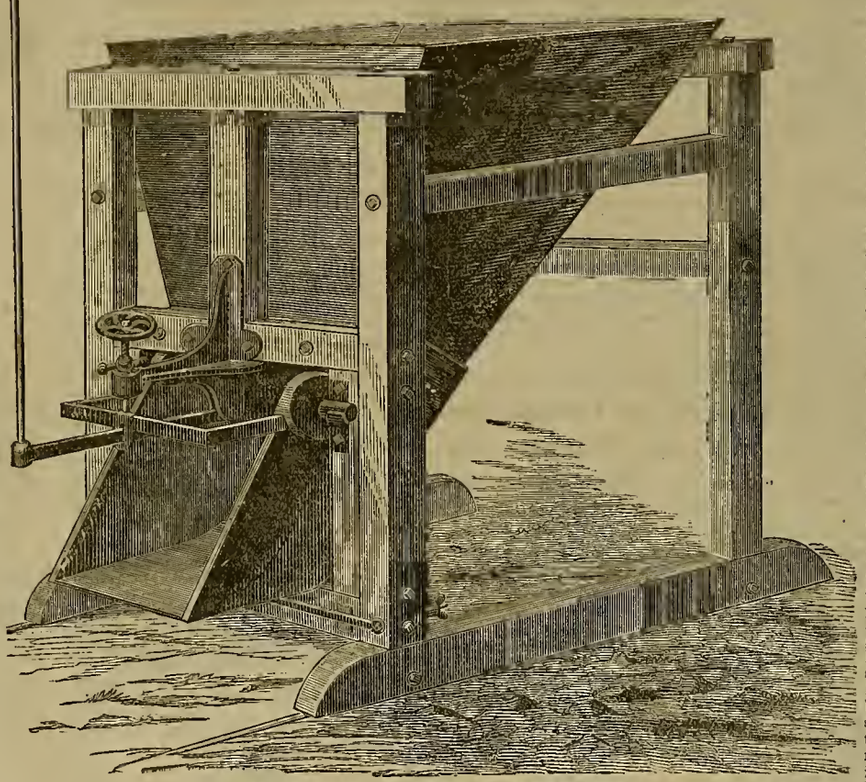
The loss in quicksilver was so small as to be not worth considering. At present we are not doing anything on account of the snow, but as soon as we can get provisions in, which will probably be in April or May, we will commence running, and we extend a cordial invitation to any who may wish to do so to visit us and satisfy themselves that we do what we claim.

All that is necessary to make Meadow Lake one of the best bullion-producing districts on the coast, is to have moneyed men interest themselves, build mills of sufficient capacity to handle at least 20 tons per day and develop the mines. The ore can be worked for $5 per ton provided 20 tons or more can be worked per day, which can be easily done with proper works; and, considering the fact that there is plenty of ore worth from $20 up into the hundreds per ton, very handsome results could be realized.

We have worked ore from all parts of the district and have not asked or received a particle of help from any one. Knowing the reputation the district has we are willing to give every one the benefit of our work, feeling satisfied it is the only way to bring it before the public.

This statement may not satisfy many doubters, but to such I will say, if you wish to satisfy yourselves by visiting us, drop me a postal card expressing such a desire and I will cheerfully let you know what time we will commence operations in the spring. JAS. B. GIFFEN.

Truckee, Jan. 26, 1880.



THE IMPROVED STANFORD ORE FEEDER.

The Stanford Ore Feeder.

The engraving presented herewith represents the improved Stanford Ore Feeder, manufactured by Joshua Hendy, 49 and 51 Fremont street. Since Mr. Hendy began to manufacture this feeder he has made many changes in details of construction which have greatly improved it. The essential feature of the carrier or feed table, moving in the arc of a circle, is, however, preserved. This carrier is supported on side journals on the frame, and is swung back by the tappet of the stamp stem operating the rod and lever, the ore falling into the battery as the stamps require it. As the pressure is relieved by the lift of the stamps, the carrier comes forward against the regulator ready for the next stroke. The best ore feeder is that which keeps the smallest amount of ore under the stamp, and does not allow iron and iron to come together. The stamps will then do the largest amount of work. By the use of a good ore feeder there is 20% more ore crushed than by hand feeding, and 15% less wear of iron.

The regulating screw shown in the engraving, regulates the amount of throw by striking against the bail, at the point where the lever passes through, the amount of feed being thus regulated. This machine for dry crushing is equally as good and durable as the "Challenge Ore Feeder," also manufactured by Mr. Hendy. It is now sold at the low price of $75—the cheapest ore feeder in the market.

The Hofmann Process.

A short time since we gave from the pen of Mr. Guido Kustel, a description of a newly patented process of Mr. Ottokar Hofmann, for treating auriferous silver ores. Mr. Aaron and Mr. Dostkan, both expressed surprise at a patent being granted for what they considered old processes, used successively. Mr. Kustel in our last issue answered their objections, which has called forth from these gentlemen the following rather shrap replies:

EDITORS PRESS:—In your last issue I find in answer to my remarks on the alleged novelty of the Hofmann process, Mr. Kustel's defence of its claims.

He begins by assuming that there is a vast difference between an argentiferous gold ore and an auriferous silver ore without any points of contact between both; furthermore, accuses me of claiming the introduction of the Patera method before Plattner in 1865, while in fact I simply claim the introduction of salt roasting in connection with the Plattner in that year at Grass Valley, not for the purpose of chlorinating the silver contained in the gold ores treated, but to prevent the excessive consumption of chlorine in the subsequent impregnation by the alkaline earths, chiefly magnesia, an improvement of great value in the chlorine process in general. He continues by doubting that simplicity is an important element in a practical process, and finally, to cap the climax, expresses by insinuation his doubt of my ability to make experiments anyhow, reserving very modestly this heavenly gift to himself and Mr. Hofmann exclusively. Mr. Kustel triumphantly claims a success for his process.

But let us look at the facts of the case. Mr. Hofmann treats his gold-bearing silver ore with the Kiss process to extract the gold and silver at the same time. He finds his tailings too rich in gold and treats them by the Plattner; his result is 95% of the gold and silver.

He has found a good way of treating his ore, but has he found a new process? Mr. Kustel says his process is a combination of the Kiss—not Patera—and Plattner processes. He says the Kiss process extracts both silver and gold and the Patera does not. I say both processes extract gold, the hyposulphite of soda as well as lime, and I substitute the Patera for the Kiss in his combination. Does he still consider it his patent? Will he answer this question? For my own part, as I mentioned before, my results on tailings treated previously for silver by the Patera and subsequently by the Plattner were entirely unsatisfactory, and the future will show the practical use of the alleged novelty of the Hofmann process to be limited. Mr. Kustel tells us that the hyposulphite of lime had to be completely leached out to get a good result by the Hofmann novelty. Will he explain why this should be so, when it is easily decomposed by the chlorine used in excess in the subsequent Plattner. In my experiments on tailings my results were poor, no matter how completely I freed the residues from hyposulphite.

Mr. Kustel further on *pretends* to believe that I claimed a patent on the chlorine process, while he *knows* that my patent covers but a system of apparatus in connection with the process, which he amongst the rest of chlorinators adopted in this State.

Finally, Mr. Kustel remarks that any metallurgist leaving from $12 to $18 per ton in the sulphuret tailings hardly understood his business, a statement not surprising to me in view of his limited experience in this metallurgical branch of our profession; $18 per ton in roasted ore represents but $13 per ton of raw ore, as all highly concentrated sulphurets lose not less than 20% to 30% in weight by roasting and leaching. As the original ore carries perhaps $130 per ton in gold, it represents but a residue of 10% in the tailings, and is not a poor result by any means on many troublesome sulphurets in this State.

In conclusion, Messrs. Editors, permit me to express my surprise at the want of consideration and gratitude manifested by Mr. Kustel, considering the fact that to *me exclusively* is he indebted for all his earlier knowledge of the Cali-

CONTINUED ON PAGE 76.

The Engineer.

The State Engineer and the Debris Question.

The report of the State Engineer was handed to the Governor last week, and is now in the hands of the State Printer. It is understood that the following positions are taken with reference to the drainage of the Sacramento valley and the mining debris deposits:

First—The valley rivers, already much deficient in capacity to carry the waters of ordinary floods, are annually in the most important divisions, becoming less capable of performing this duty.

Second—The great primary cause of this deterioration of the channels, is the flow of sands from the canyons into which the mining detritus is dumped.

Third—The carrying capacity of the streams and their efficiency as drains have been greatly injured, and the problems of regulating the drainage of the valley has been much complicated by the injudicious location of embankments, and ths uneven results of leveling along the rivers.

Fourth—The river channels never were capable of passing the waters of ordinary floods through some of their divisions, without material rectification thereof, and the attempts to confine flood water by the simple construction of levees without systemization, and the aid of other devices to improve the channels themselves, could not have succeeded generally, even though the sand flow had not come down the rivers.

Fifth—The very existence of Steamboat slough, an important branch of this river, as a navigable and flood-carrying channel, is threatened—as evidenced by its rapid filling within recent years.

Sixth—In the natural order of things, we may look for the serious impairment of the navigable qualities of the lower portion of the main river in the near future.

Seventh—The presence of this sand in the upper rivers, whence it is liable to be brought down in great quantities, impairs the confidence which ought to exist in the success of whatever plans may be projected to regulate and facilitate the drainage of the valley, and hence it is doubly important to ward off the danger.

Eighth—If the deposit of detritus in the streams were to cease at once, yet would it be necessary to restrain in the canyons that which is already there, and regulate the flow of the sands therefrom, in order that we may count with any considerable degree of certainty upon the efficiency and permanence of drainage works in the valley.

Ninth—This danger can be warded off, in a great degree at least, without radical interference with existing interests.

Tenth—The restraint of the sands in the canyons admits of no delay. It is the first objective point in the restoration and improvement of the carrying capacity of the valley streams.

Eleventh—If this desirable result were measurably secured, the natural action of the rivers—relieved from the load they now have to carry—would be to excavate their bede and gradually work back to the regimen of 20 years ago.

Twelfth—The accomplishment of this result can be greatly hastened by engineering devices and works, and subsequent management thereof, and under any plan this treatment of the natural drains must form the chief feature of the scheme for providing rapid passage for the waters.

Thirteenth—As it would have been eminently practicable to have improved the carrying capacity of the streams to a very great extent before they became injured by the sand-flow, so as they are brought back to their former regimen, may their rectification and enlargement of capacity be carried far beyond that point.

Fourteenth—This filling of the main channels, though confined to the Feather river and the Sacramento below the Feather, does—by raising the flood lines at the junction of the rivers—reduce the slope and capacity of the Sacramento above the point of junction, causing greater overflow and seriously complicating the problem of drainage in the upper valley.

Fifteenth—The inter-dependence of works for the prevention of overflow throughout the valley has been so completely demonstrated by the mishaps and disasters of the past, the solution of the problem of drainage here presented can only be hoped for when the work is carried forward with the one object of disposing of the waters as a whole, and not, as heretofore, for purposes of the reclamation of separate parcels or districts of land, and, therefore, it is essential that these operations should be under one head.

Sixteenth—The direct injury to valley lands, caused by the flow of sand and "slickens" over certain large tracks thereof, does not represent the measure of harm thus far done to the agricultural interest; for other lands are in danger of similar submersion, still others have been rendered less fit for cultivation by having the flood lines raised in the adjacent streams so as to make them swampy in character, and the great body of the low valley lands has become less valuable because more difficult of permanent reclamation by reason of the injury to the flood-carrying capacity of the rivers.

Seventeenth—On the other hand, however, there are lands in large bodies which, as they stand now, are more valuable than before the stream beds were raised. For having been dry lands of poor soil, they have been rendered moist and tillable in a high degree by the raising of the sub-surface waters in them, which has followed as a consequence of the raising of the streams.

Eighteenth—Without doubt much of the mining detritus can be kept out of the main canyons, thus largely diminishing the quantity to be there reservoired, but how far this remedy, or prevention rather, may be applied, can only be determined by special examination of the various properties.

Nineteenth—This is a subject of great scope and importance, directly affecting the welfare and prosperity of a large portion of the people of the State, and the problems involved are of the gravest character, so that their solution cannot be arrived at, or fully marked out even, in a year.

Twentieth—Remedial works can only be carried out by degrees, and the detail of treatment which the subject must receive can only be determined upon finally, as the partial results attained point out the way, and by such policy a satisfactory issue may be looked forward to with hope and confidence.

[NOTE.—These last conclusions will be illustrated in the report on Mining Detritus.]

The study of this matter having brought me to a sense of the absolute necessity for organized effort in these matters, I can only recommend that the State take charge of the drainage ways and all drainage works, and exercise such control over them as will regulate their use, promote their improvement, and systematize the construction and management of all works designed to promote rapid drainage and prevent inundation.

As to who is to pay for the necessary work, it does not appear that any suggestions find a proper place in this report. I may remark, however, that nothing which has been said is to be interpreted as meaning that I see no way of accomplishing the desired end except by State work. On the contrary, while some of the works necessary are certainly such as the State might, with propriety, contribute towards, the great bulk of the work is such as should be paid for by the property in the drainage districts whose waters are to be purified and conducted away. And it would seem strange in view of the immense amount of property affected, if the necessary funds could not be secured by organized effort.

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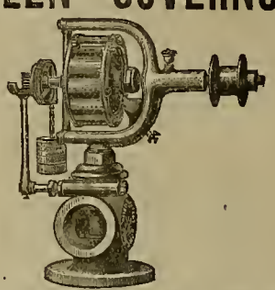

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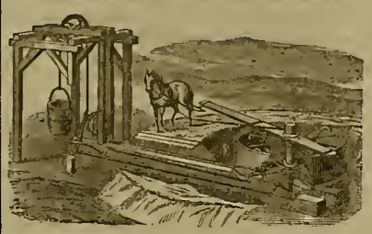

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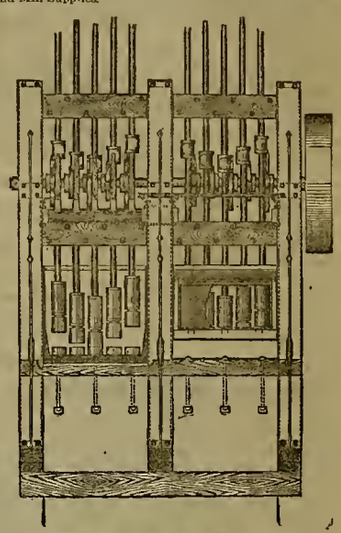

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CONTINUED FROM PAGE 69.

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IRENE.—The shaft is down 100 ft, all in ore. As it goes down the galena disappears and the ore is a gray carbonate of a richer quality.

SILVER ERA.—A fine quality of ore is still being obtained from this mine. Specimens indicate very high-grade ore.

EAST RICHMOND.—They are striking large bodies of rich ore.

TUCSON ITEMS.—Conaiderable work is being done on mine located a few miles from Tucson. Mr. B. Salazar ie opening up his Black Metal claim. Mr. J. D. Andrewe is doing assessment work for Col Sykes, on the Buena Vista mine, and has started a tunnel which is to tap the vein at a depth of 200 ft. The slight developments already made show some good ore. The Silver Moon mining company have several men at work on some of their property, with fair ore and good prospects. Messrs. Labaree and Davis are also doing some work in the Evergreen district, with encouraging prospects. Developments on the Hope mine, by Mr. Samuel Hughes, show high-grade ore and a large, well-defined vein. These mines are within a distance of 10 to 20 miles from Tucson.

COLORADO.

TROPIC.—Georgetown *Courier*, Jan. 15: The bottom of the working shaft ie in ore that aesays between $500 and $600 per ton.

FREELAND.—The Freeland is producing 75 tons of ore per day, and the product will be increased to 120 tons. The cost of concentration is 75 cents per ton. The ore in sight is estimated at nearly $2,000,000.

BASSICK.—Silver Cliff *Prospector*, Jan. 13: As the work of excavating goes on richer and more inexhauetible bede of ore are revealed. Over $2,000 worth of ore is daily brought to the eampling works of Silver Cliff, and crushed and made ready for shipment to Omaha, where it is reduced and refined. The Bassick is a wonder, and speake loudly for the mineral riches of this section. That our geme may sparkle it ie only nceeeeary to tear off their rude covering.

EL DORADO.—Denver *Tribune*, Jan. 14: At a depth of 25 ft mineral was struck, running 250 ounces eilver per ton. Thus eucouraged the owners stuck to it, though snowed in and alone (their fellow proepectors on the mountain having sought a more congenial clime), until a few days ago, when one of them came out on snow-shoes, bringing with him samples of ore which assayed over 4,000 ounces silver per ton. These were taken out at a depth of 40 ft.

BONANZA.—They are taking out ore running from 250 to 500 ounce in silver per ton.

COLORADO DIAMOND TUNNEL.—*Miner*, Jan. 10: The tunnel ie completed a distance of 1,503 ft, and ie one of the best in the county. No. 4 lode hae been developed by drifting and raising about 250 ft, from which some very rich ore has been taken. The west shaft of No. 5 returns from $70 to $630 per ton. On what is known as the Engine level of No. 5 lode, ore has been taken out giving from 50 to 700 ounces per ton. Ore from the 130 level runs from 50 to 453 ounces per ton.

CORRY CITY.—The shaft ie 120 ft deep, and a tunnel intersects the lode about 60 ft deep. At that depth a mammoth true fiseure vein carries ecattered ore throughout, an average eample of which gave 30 ounce eilver per ton.

M. B. HYNDMAN.—*Register-Call*, Jan. 16: Shaft 40 ft deep. The ore yields from threeaud a half to eight ounces gold per ton.

CYCLOPS.—The lowest grade ore sold to the Boston & Colorado Smelting Co. brought over $180 per ton and the highest over $400.

BLUE BIRD.—The last returns from the emelters gave 50 ouuces silver per ton. The Valley works from the same material gave 142 ounces.

MONTANA.

MOOSE.—Butte *Miner*, Jan. 13: It lies southeast of the Magna Charta. The diecovery ehaft is down 40 ft on a narrow streak of ore which has widened to a three-ft ledge of very fair ore. About 400 ft southeast of discovery a ehaft is 45 ft in the ledge, which is wide. The ore assays 63 ounces in silver and $4 in gold. About 100 ft east a shaft ie down 55 ft.

ALICE.—The breast of ore on the 400 level is looking magnificently; still continuing to hold its great width, and they are now extracting from it eome wonderfully rich ore, a great deal of which looke ae though it had been literally plastered over with silver. On the 500 level the west drift is looking finely, and the present indications are that it will prove richer than the 400 level.

MOUNTAIN.—The rich chute of copper ore dips to the east. Ledge is 8 ft wide, carrying ore, of high grade in copper and rich in silver. At the main shaft the bottom shows the richest and largest body of ore yet discovered in thie section of the country. They are raising from 10 to 15 tons of first-class copper ore daily, besides which a large quantity of second-class ore is extracted. It lies upon the dump awaiting the completion of the new smelter.

CONDOR.—The main ehaft ie down 150 ft. The ore body on the 63 level is very large and etrong, being at one point 23 ft wide.

BLACK BEAR.—Siuking has been resumed on the main shaft. They have come into a very promising-looking body of ore about two ft in width. The etope east on the 50 level is still yielding considerable high-grade ore, and the face of the drift shows about two and one-half ft of ledge matter, some of which ie very rich.

SELF RELIER.—The main shaft ie down 63 ft. In the ledge no walls have been found. The widtb of the ledge is therefore undecided. A drift has been run east 40 ft on the 50 level. The drift is seven ft wide and all in ore, a great deal of which assays high. One assay went 60 ounces in silver and 75% manganese. East of the main shaft another shaft has been started, and ie now down 24 ft. The bottom shows a 10-ft lode of low-grade ore carrying a heavy percentage of manganese.

GAONON.—The etopes on the upper level, from which the free-milling ore is extracted, have widened out and materially improved in character. The large and exceedingly rich body of base ore, which ie at preeent being opened on the west drift of the 150 level, is also looking remarkably well. The ore in places on this drift is fabulously rich. They are extracting from 12 to 20 tons of free ore daily.

GRAY ROCK.—They are drifting east and west on the promising ore body encountered in the croecut. South from the main ehaft it ehows from three to four ft wide and assays quite high. A great deal of bass ore is also being developed ou this mine, eome of it of an exceedingly high grade.

FISHER.—The main shaft is down 25 ft, following this ledge, which varies in width from one to four ft; the ore assays 50 ounces. The ledge in the bottom ie somewhat broken. They are now sinking another ebaft east of the main shaft. The ledge at thie point ie etronger and better defined than in the old ehaft; tbe ore also assays somewhat higher.

LEXINGTON.—Large quantities of ore are being daily extracted, most of it coming from ths stopes east of the main ehaft where, in spite of the enormously large quantity of ore already extracted, there seems to be no difficulty in taking out sufficient to keep Davis' mill running full blast. The ore body in this mine, although not very wide, is fully 800 ft in length, and all pay. Stoping hae been principally confined to the workings east of the main shaft. The various drifts run west from that point have been driven with a view of ascertaining as nearly as possible ths pay chute. The ore body developed has proven so large that it hae been deemed unnecessary to carry on the prospecting below water level, it being estimated that there is now in eight sufficient ore to run Davis' mill for three months.

MORNING STAR.—Shaft No. 2 is being sunk as rapidly as possible, and has now attained a depth of 60 ft, still following a two-ft ledge of very rich ore. They are making preparatione to erect a whim on this ehaft, the water having become very troublesome and the old whim on the old ehaft being unable alone to successfully cope with it. Sinking ou the west shaft has been for the preeent euspended, and will not be resumed for some time. The stope west of shaft No. 2 begins to look finely, and is yielding a large quantity of very high-grade ore.

NEW MEXICO.

MINING ITEM.—*Grant County Herald*, Jan. 10: We learn that Malcolm McGregor is working upon a copper lead, recently discovered, about seven miles south of Georgetown and three miles west of the Mimbres river. The discovery was made some six months since, and Mr. McGregor commenced operations about a month ago. The ore is principally carbonate and red oxide with some native copper intermingled. It is about 45% copper. The lead is well defined, is between seven and eight ft wide on the surface, and this width increases as greater depth is reached. The ehaft is now nearly 30 ft deep, and it is Mr. McGregor's intention to push on to the depth of 50 ft, and should the mine hold out, as it now promises, work will be continued on it throughout the entire winter.

LONE MOUNTAIN DISTRICT.—Of the mines now being worked in the Lone Mountain district, five are regarded as taking the lead. Of these the Campbell No. 1 shows a breast of ore about 30 ft in width, and running under the mountain, with a dip of about 25 degrees. Work has been pushed on this incline to a depth of some 30 ft, and every foot of development has shown improving quality of ore. That which is now being taken out mills from 100 to 300 ounces to the ton. The mine ie regarded as the finest thing in the camp. The Home Ticket and Two Jacks, owned by Froet and Palmer, also ehow splendid ore in large quantities. A batch of three tone taken from these mines, and recently worked by T. W. Holson, in the Lone Mountain mill, returned over 500 ounces to the ton.

News in Brief.

KEARNEY is en route to California.

PARNELL arrived at Cleveland, O., Saturday.

LOS ANOELES wants some new Federal buildings.

THE whooping cough is prevalent in San Diego.

ANOTHER important surrender of insurgents has taken place in Cuba.

NEAR Watsonville, Friday last, a whale nearly 60 feet long washed up on ths beach.

THE trouble between masters and men at Bolton, England, hes been compromised.

GEORGE TIBBETT, on trial for murder at Bakersfield, has been declared not guilty.

A NEW bill is to be iutroduced in the Spanish Cortes for the abolition of slevery in Cuba.

OWING to a failurs of crops, apprehensions of famine are felt in several Russian proviuces.

A DELEGATION of Uncompahgre and Southern Ute Indians are on their way to Washington.

THE Supreme Court of Maine has decided that the Republican Legislature ie the legal one.

SILVER in London, 52⅞; consols, 98⅛; 5% United Statee bonds, 105⅝; 4s, 107¾; 4½s, 110¼.

THE Germans at Petersburg, Va., are making liberal contributions for the sufferers in Upper Silesia.

SEVERE shocke of earthquake occurred at Havana recently, an unprecedented experience there.

TEXAS cow-boys recently killed the City Marshal and two citizens, and wounded five others, at Las Vegas.

THE examination into the causes of the colored exodus from the South is still in progress at Washington.

THE British and Portuguese troops are united in the suppression of the slave trade in Mozembique channel.

THE Dublin Mansion House committee has so fer granted £8,340 for the relief of the distressed in Ireland.

THE consolidation of the Union Pacific, Kansas Pacific and Denver Pacific railroede has been accomplished.

THE proposition to build a $100,000 hotel at Alum Rock Springe seems to meet with general favor at San Jose.

LAST Wedueeday thirteen tons and a half of broomcorn was shipped from the Rancho Chico to San Francisco.

TERRIBLE distress prevails in Adrianople, 15 persons having recently been found dead from hunger in one day.

THE New York *Commercial Bulletin* considers the De Lessepe canal scheme the wildest of financial impossibilities.

THE trial trip of the Italian ironclad *Duilio*, the most powerful war vessel in the world, on Saturday, was eminently eatisfactory.

DURING the coming spring the lakes in the vicinity of Mammoth City are to he stocked with trout from the McCloud river.

A DISPATCH from Guaymas, Mexico, to Los Angeles announces the re-capture of Hamilton, the defaulting Tax Collector. An officer has gone after him.

The Hofmann Process.

[CONTINUED FROM PAGE 73.]

fornia practice of the chlorine process. Or doss he deny that I gave him the privilege to take his notes on my practice of the process at my works ou the San Bruno road, San Francisco, in 1863, for his publication on "Silver and Gold Extraction." Or again does he deny that he begged the privilege, which I generously granted to him, of a few days' observations and study of my practice at my works in Grass Valley in 1865 or 1866, for the purpose of incorporating it in his second publication? Does he deny that he promised to give me full credit therefor, and how did he fulfill his promise? On this subject in some other number. G. F. DEETKEN.

San Francisco, Jan. 26, 1880.

Mr. Aeron explains his connection with the Patchsn process, and disclaims any pretention to the inventing the use of copper di-chloride in amalgamation, as follows:

EDITORS PRESS:—It is not desirable to occupy your columns with squahbling, yet I must ask leave to say a few words in answer to Mr. Kustel's defense (?) of the Hofmann patent.

I never claimed the use of copper dichlorids in amalgamation, as anyone who reeds my hook may see.

The Patchen process, to my connection with which Mr. Kustel perhaps alludes, consists in ths use of the copper chlorides in a peculiar manner, with peculiar apparatus, in connection with iron pens.

The Hofmann processs is not a *combination*, but a *succession* of known processes, pure and simple. They are coupled, like cars in a train, not combined.

The Kiss process is simply a modification of the Patera, in which, for cheapness and convenience, the salts of calcium are substituted for the similar salts of sodium.

The Patsra *does* extract gold as well as the Kiss. I have extracted by it at ths rats of $84 psr ton, mors than 50% of the gold contained in the ore.

Mr. Kustsl thinks that an operator who leavss $18 per ton in his tailings does not understand his business. I have a pile of sulphuret tailings of Mr. Kustel's own makiug. I have sampled that pils. It assays gold $17.58, silver $10.52, or a total of $28.10 per ton.

C. H. AARON.

The Boiler Inspector Act.

Meetings of the Judiciary Committes of ths Board of Supervisors were held last week to give dealers and workers in iron an opportunity to enter a remonstrance ageinst ths appointment of a Boiler Inspector, which had been recommsnded by the Board of Fire Commissioners. Mr. F. A. Gibbs said that he had for four years resisted the appointment of a Boiler Inspector, and had been sustained in his resistance by all the iron dealers, foundrymen and nearly all boiler owners of the city. Hs rsviewed the legislation on this subject, and pronounced the act of the Legislature as a schems concocted by blackmailers. Mr. Gibbs spoke at length, citing facts and circumstances to sustain the assertion that the appointment of an inspector would he contrary to public policy, and would elicit the oppoeition of all reputeble deelers in iron. When the bill providing for the appointment of an Inspector was presented to the Legislature of 1875-6, Representatives from all counties except this asked that their counties be exempt from the operations of the proposed law. He seid he looked upon the law ae a blackmailing one, which would work great hardship on owners of boilers, as it would require them to have boilere constructed of iron costing 50% more than that now in use.

Irving M. Scott, of the firm of Prescott, Scott & Co., said that there would be no objection to a Boiler Inspector on proper conditions, hut under the present law the position was capahle of being used as an instrument of oppression and extortion. Not only were all boilers for engines to be exemined every year, but even the steam tanks in private kitchens had to undergo a similar examination at an expense of $3 per year. Then it was possible for the inspector to rule that only a certain kind of fixtures and material, which could be bought only of one dealer, should be used, eo that he might get a commission on the sales, and the whole thing turned into a blackmeil machine. The speaker further said: I think the origin of the law was to make a place for some one. It has been said that it was done in the interest of some iron firm, but I don't think there is anything in that. No inspector is required, as the owner of the property is the most effective inspector. There is a difference between an explosion and a hursting. The theory of explosions has never yet heen explained, hut a bursting is giving way of a weak epot in the hoiler. He said also that more explosions hed occurred in Pittsburg, where inspectors are employed, than in San Francisco.

Ira P. Rankin of the Pacific Iron Works said: There has never heen a popular call for this lew. The tax-payers must be on their guard against schemes of this kind, for I consider it a scheme. It will oppress manufacturers. Whoever fills the place will have much power for evil. He can recommend certain firms to the detriment of othsrs, and in a fictitious ssnss will he an expsrt, and can abuse his influence and power to injure the mechenics of ths city. It is a rich vein for the movsrs of the law, and they fully apprsciate the value of it. All manufacturers of boilers are ageinst the law, and I do not think any puhlic interest will hs suhserved by it.

J. V. Hall, of the Sacramento Boilsr Works, said: This qusstion is not agitated for the appointment of an Inspector of Boilers particularly, hut for the power and influence attached to the position. I have never hsfore heard of such an arbitrary movemsnt as this proposition. When a men is given the power to say how a boiler shall he made, his power then becomes dangerous. It should bs done as it is in other countries. Have an inspector who examines a hoiler and then reports to a Board of Commissioners.

Supsrvisor Litchfisld—If I undsrstand Mr. Scott's theory, it bshooves every man to look afsr his own boilers.

Supervisor Taylor—Are not most of the accidents caused hy neglsct or carelessness?

Mr. Hall—In nearly evsry instance this is the cause. Nsw hoilers are more apt to explode than old ones.

Mr. Wheelsr, of the firm of McAfee, Whseler & Co., said, with a new boilsr there is no necssity of an inspector, as the enginser engagsd should bs a sufficient judge of the condition of the boilsr. If this appointment should be necessary, the inspection should be mads by insurance companies, as is dons in Europs. There inspectors examins the boilers before they are insured.

Mr. Moynihan, of Moynihan & Atkin, said: This bill calls for a tsst of a hoiler every six months. Now, every time you test a hoilsr the weaker you make it. If this Boiler Inspector tssts a hoiler and weakens it so that it bursts, who then is responsible? Ws have no accidents here because we are responsible for our own actions, but the moment you get a Boilsr Inspector, we are not responsible. Thers is Spreckels & Co., who have from 18 to 20 boilers, and they are held responsible; but if one of their boilers is inspsctsd and tssted to-day, and should burst to-morrow, and kill 100 persons, no damage could be rscovered from the firm, as they would have the inspector's csrtificate. I have known of but one boiler explosion in this city in 23 years.

Mr. Dickey, of the Risdon Iron Works said: This law, if enforcsd, will utterly condemn all the hoilers in San Francisco. Soms time ago we refused to build a boilsr the thickness rsquired by the United States law, because we considered it would he unsafe to run. This law will hamper the progress of boiler manufacture, if not ceuse complets stagnation. I do not think any hoilers in the city could conform to ths law.

L. B. Benchley of the Pacific Rolling Mills hsld that engineers wers responsible, and the appointment of an inspector would rsmove the responsibility from the proper parties, who were the owners of the property and the employers of the engineers.

The Judiciary Committee afsr the mestings at which the above statements were made, presented at the meeting of the Board of Supervisors on Monday evening, a majority report in the metter of appointng a Steam Boiler Inspector, on recommendation of ths Fire Commissionsrs. The Committee rsports unanimously against any action beiag taken on ths recommendation of the Board of Fire Commissioners under the act of the Legislature.

"The suhject of imposing additional conditions," eay the Committee in the report, "in the granting of privileges to erect steam boilers and tanks, or in the examination of those in operation, your Committee recommend a reference to the Committee on Fire Department, for if additional conditions should be deemed necessary, your Honorahle Board possesses ample power to impose them."

The Committee recommended the adoption of the following resolution:

Resolved, That the San Francisco Delegation in the Legislature be, and they are hereby, required to use their best efforts to secure the passage of the bill entitled "An act to repeal an act approved Merch 27, 1876, eutitled 'An act for the appointment of Inspector of Stationary Steam Boilers, and for the better security of property in the city and county of San Francisco.'"

This report as well as the resolution was adopted.

The eubject hae etill further heen discussed by the members of the San Francisco delegation at Sacramento, but no definite action has yet heen taken on it.

It ie hardly probahle that the statements made by the practical men above mentioned, can be entirely ignored by the Legislature; nor does it seem likely that they will persist in any course which will cause the appointment of a Boiler Inspector, when the men who are conversant with the subject etate that it will do more harm than good.

THE Panama eteamers will hereafter sail on the 5th and 20th of each month, with the exception of the City of Panama, which will leeve on February 4th. The eteamers which leave on the 5th will touch at Mazatlan, Manzanillo, Acapulco, San Jose de Guatemala and La Libertad, taking freight via. Acapnlco for all Central American ports. The steamere of the 20th will touch at Acapulco, San Jose de Guatemala, La Libertad and Puntas Aronas.

OUR AGENTS.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. Tharp—San Francisco.
R. W. Crowell—California.
A. C. Knox—Pacific Coast.
G. W. McGrew.—Santa Clara county.
J. B. Bachelder.—Shasta County, Cal.
James Rogers—Oregon and Washington Ter.
Thos. H. Manning—Nevada, Idaho and Montana Ter.
Capt. W. H. Seamens—Arizona.
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M. B. Starr—Contra Costa county.
F. M. Vaaden—Alameda Co., Cal.
C. A. McMahon—Butte Co., Cal.
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J. W. A. Wright—Merced, Tulare, Kern and Fresno counties.

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Bound Volumes of the Press.—We have a few sets of the back files of the Mining and Scientific Press which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Sample Copies.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

Extra Copies can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew Jackson's Best Sweet Navy Tobacco

METALS.

[WHOLESALE.]

Wednesday M., January 28, 1880.

Iron.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 8½
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 8
Norway, according to thickness	8½@ 9½
Steel.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	18 @ 19
Plow Steel	8 @ —
Copper.—	
Inget	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	—@— —
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
Lead.—	
Pig	5½@— 6
Bar	— @— 6
Pipe	— @— 8
Pipe, Sell	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 2 10
Buck, " "	— @ 2 30
Ohilled " "	— @ 2 50
Tin Plates.—	
10x14 I C Charcoal	10½@ 11½
10x14 I C Coke	10 @ 10½
Banca Tin	— @— —
Australian	24 @ 25
I. C. Charcoal, Roofing 14x20	10 50 @11 00
" " " " 20x23	21 50 @22 00
Zinc.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	10½@— 11
Nails.—	
Assorted sizes	3 50@4 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

San Francisco, January 28, 3 P. M.

Silver, ¼ par.
Gold Bars, 890@910. Silver Bars, 10@18 ₰ cent. discount.
Exchange on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₰ dollar; Mexican dollars, 90@90¼.
London Consols, 97 5-16; Bonds (4½), 107¾.
Quicksilver in S. F., by the flask, ₰ lb. 39c.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juan County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Fourth (24th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGrew, Secretary.

Office—Room 7, No 420 Montgomery street, San Francisco, California.

Butte Hydraulic Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't
E Peirson	13	2½	$25 00
L Laplerre	22	2½	25 00
H Marcoux	24	2½	25 00
J B Lussier	25	2½	25 00
John Britt	26	2½	25 00
Geo W Deitzler	37	5	50 00
N Desautelle	41	2½	25 00
Jos Lucier	42	2½	25 00
N Goldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervais	45	10	100 00
Geo Moreau	46	5	50 00
Geo W Deitzler	47	15	150 00
A S Hawes	17	10	100 00
J Callandreau	4	10	100 00
A M Wilder, Trustee	1	10	100 00
A L Lengfeld	5	5	50 00
L L Dennery	6	5	50 00
W E Lutz	7	5	50 00
Geo. H. Powers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francisco California, on Monday, the 22nd day of December, 1879 at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L DENNERY, Secretary.

Office, room 3, No. 220 Sansome St., San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock of the Butte Hydraulic Mining Company is postponed to the Fifth day of January, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock is postponed to the second day of February, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

San Francisco, Cal., January 3d, 1870.

Gila Silver Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Reveille Mining District, Nye County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of January, 1880, an assessment (No. 6) of twenty-five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, Safe Deposit building, 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Seventeenth day of February, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the Ninth (9th) day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. W. PARRISH, Secretary.

Office—Room 7, Safe Deposit Building, No. 328 Montgomery street, San Francisco, California.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the 24th day of December, 1879, an assessment (No. 40) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the First day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Rocky Point Mining Company.—Location

of principal place of business San Francisco, California. Location of works, Placer County, California

Notice is hereby given that at a meeting of the Board of Directors, held on the Fourteenth day of January, 1880, an assessment (No. 2) of Ten Cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. Gold coin, to the Secretary, at the office of the Company, room 1, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 11th day of March, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors

A. C. TAYLOR, Secretary pro tem.

Office, 314 Bush street, San Francisco, California.

DIVIDEND NOTICE.

—OFFICE OF THE—

Black Bear Quartz Mining Company,

Room 13, Safe Deposit Building, San Francisco,

JANUARY, 27th, 1880.

A Dividend (No. 69) of FIFTY (50c) CENTS per share has been declared on the Capital Stock of the BLACK BEAR QUARTZ Mining Company, payable immediately.

WM. LETTS OLIVER,
Secretary.

ANNUAL MEETING.

The Annual Meeting of the stockholders of the GLOBE CONSOLIDATED MINING COMPANY will be held at the office of the Company, room 2, No. 106 Leidesdorff street, San Francisco, California, on THURSDAY, the 5th day of February, 1880, at the hour of 12 M., for the election of a Board of Directors to serve the ensuing year and the transaction of such other business as may properly come before said meeting.

O. H. BOOART, Secretary.

Amusements.

BALDWIN'S THEATER.

Thomas Maguire ..... Manager.
Chas. H. Goodwin ..... Treasurer.
J. P. Chapman ..... Assistant Treasurer.

CLARA MORRIS.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

Chas. E. Locke ..... Lessee and Manager

MELVILLE OPERA COMPANY.

Open every evening and Saturday Matinee.

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MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS

Nos. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive.

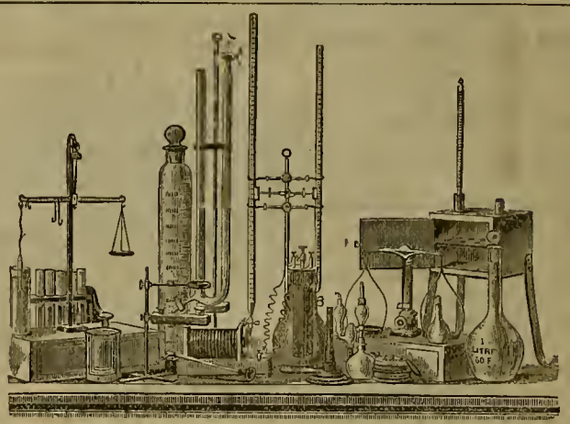
Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO.,

SAN FRANCISCO, CAL.



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No. 2.—Will do the work thoroughly in all but the hardest kinds of rock.

No. 3.—For bench work, pipe-clay, soft and shelly rock, outside work and quarrying.

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ALL STYLES OF FANCY HEAD BOLTS. HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

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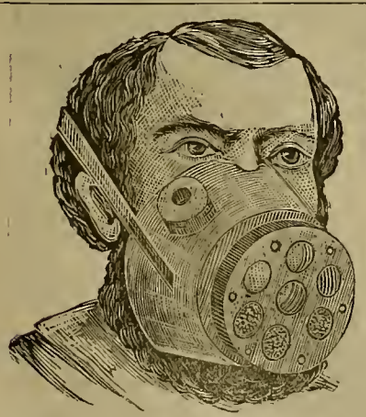

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Prevents Lead Poisoning and Salivation.

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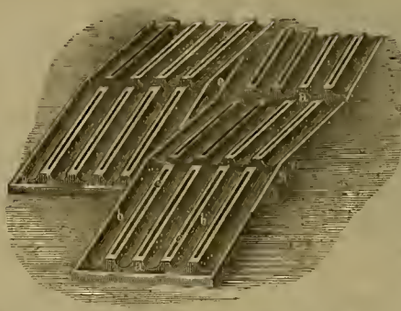

This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

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SILVER PLATED AMALGAMATING PLATES.

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THE PATENT CHANNEL IRON WHEELBARROWS.

THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand.

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BEST REFINED CAST-STEEL.

WARRANTED MOST SUPERIOR FOR DRILLS, HAMMERS, ETC.

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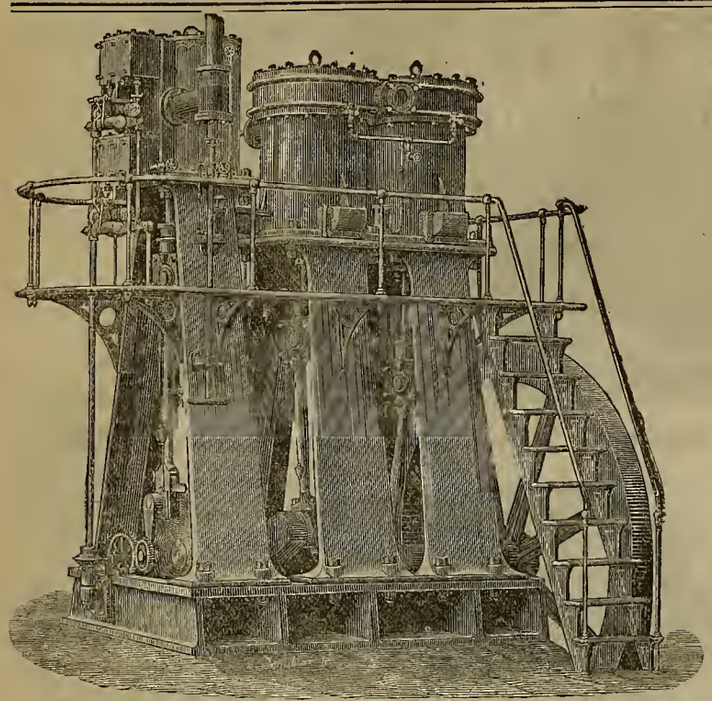

With Adjustable Cut-off Poppet Valve Engine, and Forced Iron Crank Shafts.

Mining Machinery Depot,

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AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

Price Reduced to $75.

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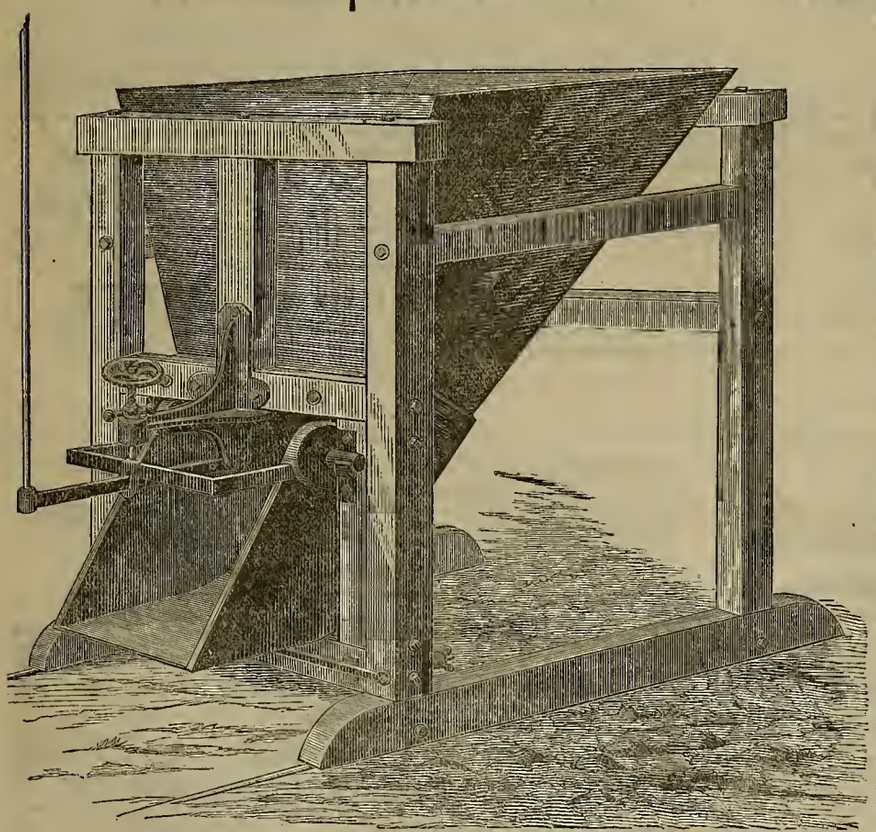

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SAN FRANCISCO, SATURDAY, FEBRUARY 7, 1880.

VOLUME XL Number 6.

Our Silver Mines Should be Fostered.

Ours is a silver-prodncing country. That metal is as mnch one of the products of the soil as is wheat or potatoes. Its production has assumed such great proportions and given employment to so many people that it has risen to the rank of a national indnstry. As such, it should meet with all the fostering care which it is possible for govcrnment to bestow upon it. By so doing, it adds to its own welfare. It angments its own wealth. It stimulates a wide field of labor for its citizens to occupy, from the product of which they are enabled to pay for such foreign articles as arc not produced at home.

Tho government stands in relation to this industry the same as a farmer does to his wheat field. If the latter neglects it, if he does not see that it is well cultivated, that good seed is cast into the soil, and that the crop is carefully garnered; instead of deriving an iucome from it, he will find that it entails a loss to him. He would he considered hy his more judicions neighhors as heing devoid of wisdom and economic management. The great financial countries of the world do not produce silver. But when they obtain it in payment of what they do prodnce, they ntilize it as a medium of interchange among their own people. Their laws are enacted with this purpose in view. They retain as far as possible their metallic currency within their own limits. By this judicious course they make their own products add indireotly to their financial facilities. But it would seem as if our government has determined to throw all possihle ohstructions in the way of the progress of this important iodustry. It demonetized silver, thus depreciating its value and forcing it down to the lower grade of more common metals. It was reduced from a measure of value to a mere article of merchandise. The fall in its value entailed a loss of millions of dollars in silver alooe; and of consequential loss through the disturhance of financial and commercial transactions of a still greater amount. In this case it had sown bad seed, and neglected to properly cultivate the field or carefully garner the crop. It evinced a sad lack of executive ahility. And even now instead of aiding in its circulation, and thus opening a wide channel for its use, its operations are of a restricting character, and retard instead of advancing the great silver industry which should he judiciously nurtured. It discriminates against a leading source of its own wealth.

Every movement that has a tendency to promote the use of silver; every new chaunel that leads to an increased consumption of it; every encouragement tnat can he afforded to this industry should he followed up with promptness and decision. Every dollar's worth of silver taken from the mines is a dollar added to the national wealth. If it cost teu dollars to produce that one, the ten dollars cost is not lost to the nation; it has only changed hands from one citizen to another. It has paid for labor, for supplies or for material. It may have weakened the resources of one person, hut it has added to the resources of others. It still exists. It is not annihilated. Added to it is the one dollar which it has produced.

The principles involved in the silver question are applicable to all hranches of mining. They should be fostered by carefully digested statutes whose operative influence should he in their favor. Until this is done, all mining operations will he hurdened to the extent of the adverse policy which is pursued in regard to them.

MINING SUIT.—One of the first and most important cases to come up in the United States Circuit Court as soon as jury cases are taken up, is that of the North Noonday Mining Co. against the Orient Mining Co., to quiet title to mining property in Bodie district. The Orient is now in possession of the property, and the Noonday aeeks to eject them. It ia estimated that the trial will last several days, perhaps extending into weeks.

JACK CARLTON, chief of sconts with Howard's command in the Nez Perces war, was accidentally killed recently near Walla Walla, W. T.

Magnitude of Labor.

Tbere is nothing that has ever attained the vast proportions that lahor has acquired. It extends over the cntire glohe, so far as the operations of man are concerned, and throughout the seemingly unlimited realms of space, under the exertions of the Omnipotent Creator. Leaving out of consideration the wondrous array of stellar systems, and narrowing the view to the work of the human race, the field is still too ample for a detailed narration. It can, even in this scope only, be treated of in generalities. The animals lahor, hut it is only to the extent of self-preservation. The heaver huilds his dam across the running stream; the hirds construct their nests in the hranches of the trees; the burrowing animals dig into the surface of the earth; and the insects spin their wehs or construct their fragile colls—eacb and all guided hy the natural law of permeation of their progeny.

The lahors of man extend to a higher and oohler plane. Originating in self-preservation and protcction of offspring, they have risen to the more elevated rank of a creative power, which has encompassed the earth and left no spot upon its surface undisturhed hy their multifarious results.

In every phase of social life labor holds the sole sustaining influence, deprived of which the fabric of society would meet with annihilation, and man descend to a scale below the heaver and the hird in practical utility. In the advancement of the well-heing of the human race, lahor has ever been the motive force which has accelerated its progress. It has stimulated the intellect, and conferred aptness upon muscnlar manipulations. It has given ideas to the hrain, and deftness to the hand. Its rcsulta have pointed out new methods of attaining them, which have required lesa muscular action and more hrief periods of time, with greatly increased results.

Nothing can he effected without lahor; with it, all things can he accomplished. When in operation, it is vitality; when inactive, it becomes inertia and death. It crosses continents in its gigantic strides, steps over oceans and traverses the globe, carrying witb it beneficial results, and imparting as it goes, ardent desires for a continuing increase of its hlessings.

It points out the track of the seemingly erratic comets; it maps out the path of the sun, moon and stars; it measures the far-distant worlds, and weighs them with positive accnracy. It has constructed instrnments hy which their constituent forms of matter are made known. It overleaps the confines of the earth, and extends its efforts to the remotest regions of stellar existence.

It razes mountains to tbe level of the plain, or cuts its passage through miles of their hase. It deepens rivers, fills up lakes, makes fertile the desert. Earth is hut one of the compartments of its workshop, and in every section of that compartment it demands and compels activity. Its avocations are unlimited, extending from the least to the greatest prodnctions, from the sharpest point of a needle to the massive form of the pyramid; operating upon tbe formations of bodies almost too fragile to be touched, and working upon others of adamantine durahility.

It is a magnificent temple of God-like proportions, so vast, so extended that it embraces the whole realm of creation; so perfect in its construction that defects are unknown; so enduring in its material, that it will still exist when earth shall have passed away; so wisely planned that heauty and harmony are presented at every point, and its resultant will he the advanced welfare of man. Omniscience only could have invested lahor with its grandeur and greatness, and have stored it so fully with henefits and hlessings. Its dome rises to the highest heavens and is lighted hy the stars; ita walls contain all created matter, and its foundationa rest upon unswerving utility. Into this vast hall all must enter and perform their task, which to some will he hard to accomplish, to others, easy of performance. There is no exemption from this duty. Even those that are termed idlers and drones, work in their peculiar way to teach to others the evils of indolence, and in their own self-condemnation have the most irksome task of all to sustain.

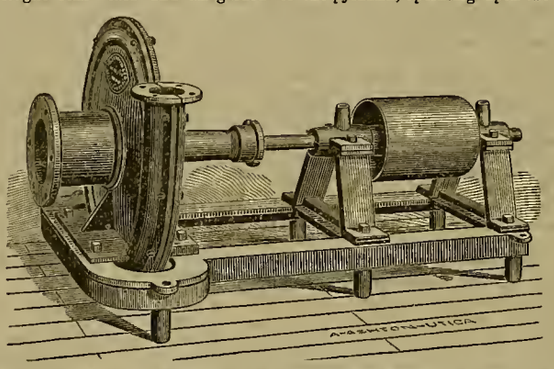

FIG. 1. PERRY CENTRIFUGAL PUMP—HORIZONTAL STYLE.

Fig. 2. Section of Piston.

METEOROLOGICAL SUMMARY FOR JANUARY.—The report of the United States Signal Service officer, of San Francisco, for the month of January, is summarized as follows: The mean hight of harometer for the month was 30.143; mean temperature, 47.8; mean humidity, 74.8; prevailing winds, north; highest harometer, 30.449; lowest, 29.765; highest temperature, 60°; lowest, 37°; monthly range, 23°; greatest velocity of wind, 36 milea per hour; total number of miles traveled hy wind, 4,622; total rainfall, 4.78 inches. Rainfall in January during former years: 1872, 4.03 inches; 1873, 1.58 inches; 1874, 5.66 inches; 1875, 8.01 inches; 1876, 7.55 inches; 1877, 4.32 inches; 1878, 1.97 inches; 1879, 3.52 inches.

NEAR Barcelona, Spain, a rich landowner, his wife, three daughters, son and two women servants were murdered in their beds, and the house ransacked.

THE Pacific Mail Steamship Co. have reduced their passenger rates to $75 in the cabin and $35 in the steerage.

The Perry Centrifugal Pump.

We give on this page an engraving of one style of the Perry centrifugal pumps, whicb has gained an excellent record at the indnstrial fairs at tbe East, and is in good repnte among those who have used it for various purposes. Tbe claim of the inventor is in the simplicity of the device, and the consequent cheapness and dnrahility in the machine. There are no valves and therefore mud, sand, gravel, or any otber substance liahlc to get into pumps when used for irrigation or in connection with manufacturing, will be carried out with the fluid, and occasion no stoppage. There are no irregular surfaces, consequently the flow of the liquid is unimpeded, and friction heing reduced to a minimum, the highest percentage of effective work is realized from the power applied. These facts adapt the pump to the emptying of dry docks, contractors' excavations, drainage or irrigation of lands, as well as elevating water in large quantities for any purpose.

There are two main styles of the Perry pump, called "vertical" and "horizontal," according to the positions of the shaft when on duty. The engraving, Fig. 1, shows the plain horizontal pump No. 2, fitted to an iron bed frame, ready to he put in operation. The flange upon the left is ready to he holted to a tank or flume when the water or other material to he raised is on a level with the top of the pump at the commencement. It will continue to act efficiently as long as the material can fill the injection pipe leading into the pump. When it is necessary for the pump to raise its own material, there is a suction attachment affixed to this flange on the left.

In order to show the simplicity of the piston used in the Perry pump, we show a sectional drawing at Fig. 2. It will he seen that it consists merely in a wheel composed of a center huh and from four to seven wings, according to the size of the pump. These wings are curved in such a manner as to give the greatest outward pressure to the fluids passing through it. The one shown in the engraving is hottom side up, showing the upper half of the shell or soroll, also presenting to view the sharp edges of the wings near the huh, and corresponding in extent to the size of the orifice in the hottom of the pump. The object of these sharp edges is to admit of the free ingress of the fluid, and also to cut any foreign substance that may enter the pump, thus preventing its becoming choked nr clogged.

These pumps are adapted to raising water to various hights, as the elevation is of conrse dependent upon rate of speed at which the pump is driven. The capacity is provided for hy different sized pumps, ranging from a delivery of 260 to 20,000 gallons per minute. Full information concerning the meehanism of the pump, its appliances and its working quality can he obtained from H. P. Gregory & Co., No. 4 California street, S. F., who are the agents for this coaat.

BIG SUBSCRIPTION TO THE IRISH RELIEF FUND. The New York *Herald*, after calling attention to its tahles showing the Irish distress, says: "In making this apneal to the henevolent, we deem it fitting to set an example which will he taken as proof of our sincerity. The *Herald*, thcrefore, opens a subscription for Irish relief, heading it with the sum of $100,000." It solicits other people to give in proportion to their willingness and means. It will receive subscriptions for any amount down to 25 cents, carefully puhlishing the name and residence of every aubscriher, and, when desired, the place of his former residence in Ireland, that the people relieved may know to whom tbey are indebted.

THE NEW IDRIA PATENT AT LAST.—On the 30th ult. a patent was signed and delivered at Washington to the New Idria mining company for the Panoche Grande quicksilver mine, in California. The application of the New Idria company had heen amended so as to conform with Secretary Schurz's opinion, puhlished in July last.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Globe District, Arizona.

EDITORS PRESS:—Globe district is still moving along. Considerable machinery that I spoke of in my last has arrived, so that the building of roads, grading of mill sites and taking out ore keeps every one busy, proving the old adage true, "A contented mind is a continual feast." I haven't, since my arrival here, a year ago, noticed the same feeling of industry that there is at present.

Every one, who a few months ago thought they had a fortune buried in some claim, and were waiting for some one to come along and buy them out at a small figure, have now gone to work to open and develop so as to realize something handsome. The idea is now pretty thoroughly exploded that our mines won't go down, for those who have the means to go down have the finest property in the camp, and are refusing big money for them. The owners of the Emiline have struck it good. Two tons which were reduced by the Isabella mill returned over $300 per ton. Yesterday they were taking out ore showing native silver which will probably pay shipping to your city for reduction. This claim is located on the same vein with the Bluebird and Danube, and between the two, proving beyond a doubt that all three are valuable.

I promised in my last to send you some items from our gold belt, as I thought at that time I could send more mill returns, but am sorry to say that the repairing and getting the mill ready occupied more time than was thought, so must leave it until my next. I am only writing about what I have visited and examined, taking no one's report for granted, so I am not liable to be led astray. A trip two or three times per week on a good mustang through the district keeps me pretty well posted.

We have the finest climate here that I ever saw, more especially in the winter; three or four cold stormy days and all is fair again. Yesterday I found an ordinary coat uncomfortable while riding in the afternoon. There is no fog; the nights are clear and cool, making it just right, neither too cool nor too warm.

We have a promise from Wells, Fargo & Co. of an express office, and without doubt will soon have the telegraph at our door.

The A. T. & S. F. R. R. are talking encouragingly, and have sent their engineers through here to hunt a route. This, together with our late sales has stimulated and started many, who a few months ago were despondent, so that Globe is liable to have a "boom" before long that will surprise some who have given her the cold shoulder.

One thing I have noticed in particular is the men coming into town. It used to be the custom to stop and visit awhile, but now it is hurly burly, gather together their tools and provisions, and off they go, showing that there is something more enticing in the hills than heretofore. Some splendid reports come from the Richmond basin, almost too good to be true; but must close, with more anon. MINER.

SALT FOR THE MILLION.—Surveyor L. D. Bond estimates the area of the great salt deposit across here in Saline valley to be about 1,200 acres. Over the greater portion of these broad acres lies a bed of pure, solid salt, full 18 inches in thickness. A portion of the central part is either covered or completely saturated with water; most, if not all the salt being taken from this marsh for use throughout this section, is shoveled out of this saturated portion; in so doing excavations nearly two feet in depth are made in the solid sheet of salt, which excavations, of course, fill with water clear and apparently pure. In three or four days' time crystallization goes on so rapidly as to renew the deposit as deep and solid as before it was disturbed, and will continue to do so indefinitely. There is salt enough there to pickle the whole animal creation of the world, humans and all. In the same valley is another smaller but very similar deposit of impure salt and borax crystals in nearly equal proportions. This valley is about 25 miles, as the crow flies, easterly from this town.—*Inyo Independent.*

KILLED BY A METEOR.—As David Meisenthaler, the well-known stockman of Whitestone township, was driving his cows to the barn about daylight this morning, he was struck by an aerolite and instantly killed. It appears as if the meteor had come from a direction a little west of south, and fell from an angle of about 60 degrees, for it first passed through a tall maple, cutting the limbs as clean as if it had been a cannon ball, and then struck him apparently on or under the shoulder, passing clean through him obliquely from below the right shoulder to above the left hip, and buried itself about two feet in the soft black ground. The poor man's head and legs were uninjured, but the greater part of his body seems to have been crushed into the earth beneath the terrific aerolite, which is about the size of a common patent bucket, and apparently of a rough round shape. It appears to be formed of what is called iron pyrites.—*Bucyrus (O.) Journal.*

Prehistoric Man.

When did Man Make his Appearance on the Pacific Coast?

The following article, by the Hon. B. B. Redding (Reno *Gazette*, Dec. 31st, 1879), deals with a subject which cannot fail to interest all who look beyond their own lives to the life of the human race—all who long to pierce the veil that shrouds the origin of man.

In no part of the world is there so good an opportunity to gather facts as to the extent of time that man has been an inhabitant of the earth, as on the Pacific coast. Prospectors and miners are at work in all directions. Hydraulic miners are washing down hills; drift miners are delving at the bottom of extinct pliocene rivers; prospectors for gold, silver and cinnabar are turning up the surface in all probable and improbable places, over an area of at least 16,000 square miles; and farmers plow up the burial places of prehistoric man, and enrich their gardens from the shell mounds and kitchen refuse of a people who had disappeared from the earth countless ages before Abraham and Lot divided Palestine into sheep ranges. All of these people find frequent evidences of the work of prehistoric man. Instead of being saved and placed in some public institution, where they can be preserved, studied and compared, they are either left where found, or adorn some bar-room collection of quartz crystals, pyrites of iron and silver ores. There is no archæological society on the Pacific coast; even

"The Society upon the Stanislaus"

Has become extinct. The total collections of the work of prehistoric man of the Pacific coast, in the California Academy of Sciences and in the State University, will number but a few dozen mortars, obsidian knives, scrapers and arrow-heads, while the Smithsonian Institute, the French Ethnological Institute, Harvard University and the British Museum contain collections that may be measured by the ton. If miners and farmers on the Pacific coast who turn up mortars, spear-heads, or other works of man, made from stone, would send them to the Academy of Sciences, or to the University, with a short account of the place where and the circumstances under which they were found, the archæological student would not be compelled to visit the Smithsonian or Harvard collections to obtain the means of comparison between the works of the people found here by Father Junipero Serra, and the race that lived on this coast before Shasta, Lassen Butte, and other now extinct volcanoes capped the Sierra with sheets of lava, or with those of a still more ancient people, who hunted and fished among the foothills of the Sierra when these hills were washed by the waters of the Pacific ocean—probably long before the Coast range of mountains made its appearance above the sea.

When Shasta and Other Volcanoes

Were pouring out lava, filling up the ancient river channels, forming our hydraulic mines, and causing a new system of drainage for the Sierra, the volcanoes of the Cascades in southeastern Oregon were sending out ashes, filling up the lakes, and making fossil the camel-llama, the one-toed horse, the saber-toothed tiger, and other animals that then roamed over that lake country. Vesuvius, in historic times, covered Pompeii and a region about five miles square with ashes. Southeastern Oregon is covered with volcanic ashes over an area of more than 200 square miles.

The evidence is beginning to accumulate that man lived in this, then lake region, of southeastern Oregon, contemporaneous with the fossil horse, the camel-llama and other animals now extinct. In Big Bone prairie, in the Silver Lake region, in connection with the remains of these animals, Prof. Cope's men lately found arrow-heads, and so-called spear-heads. These differ in form from any now used by California or Oregon Indians. These so-called spear-heads are flakes of obsidian of various lengths, from 5 to 12 inches, chipped into a long, oval form, pointed at both extremities, sharpened at the edges, and varying in thickness at the thickest part—dependent upon the length—the smallest being a half-inch, and the largest an inch. Whatever the size, the form and proportions are always relatively the same. They were probably not spear-heads, as, if used for this purpose, there would be no object in sharpening both extremities. They were probably knives used for some special purpose. The oldest living California and Oregon Indians do not use them, and do not know what they were for. The McCloud Indians

Still make Stone Knives,

Scrapers and arrow-heads, but nothing of this form. None of this kind have been found in the shell mounds or burial places of Pacific coast Indians, and some of the "kitchen middens" of the coast of California, must have been thousands of years in accumulating. They have never been found in California, except, below the boulders in hydraulic mines, at the bottom of extinct pliocene rivers, or below the auriferous earth and gravel of placer mines, and, as stated lately by Prof. Cope in Oregon, in connection with the fossil bones of extinct animals. There are two of these spear heads in the Smithsonian collection, one from the hydraulic mines of Calaveras county, and the other, numbered 7,342, from Folsom, Sacramento county. This spear head was found, with a disk of slate, having a hole in the center, on a ledge of granite, at the bottom of the gold mines, 23 feet below the present surface of the streets of the town of Folsom. About 30 feet below the streets of Folsom, the miners find a bed of hard, salt-water mud, filled with fossil oyster shells, and shells of the extinct crustaceans of what Clarence King calls the miocene ocean. This ledge of granite is a point from the foothills of the Sierra that jutted out into this ancient sea. Who were the people that hunted and fished along the foothills when the bass of the Sierra was washed by the ocean? Was the top of Diablo then an island? Or was the

Sacramento Valley an Island Sea

Like Puget sound or the Black sea? It is not singular that more of the spear-heads of these primeval people are not found, or that when discovered they should be found beneath the drift and boulders of our gold mines. If any were left on or near the present surface, and had been discovered by the ancestors of our present Indians, they would have been split into knives and arrow-heads, for obsidian in any form was of the first necessity, and the most valuable material in use until white men brought iron to the coast. So far as I can learn, there are five of these peculiar spear-heads in public institutions, two at the Smithsonian, two in the possession of Prof. Cope, and one at Harvard. There are probably dozens in miners' cabins, or ornamenting bar-rooms in the mountains, or used as paper weights in village grocery stores in California and Oregon, which, if they could be gathered in some public institution, with the facts and history of their discovery, would go far to prove that man made his appearance on earth, and lived on this coast when the mastodon, elephant, cave bear and saber-toothed tiger wandered among the foothills of the Sierra, or, perhaps earlier still, when the earth had so far evolved from hot chaos as to develop a climate that would give him food and provide him with shelter.

The Debris Question.

Certain Dutch Flat miners have a plan for solving the Bear River debris question which, though extensive, seems practical, and therefore worthy of thorough consideration. It is proposed by them to run a tunnel from the bed of Bear river through to the North Fork canyon, at a point a little above Colfax, Cape Horn, and through this tunnel divert all the debris that otherwise would flow down to harass and injure the Bear River farmers. A tunnel for this purpose, with sufficient grade, would be about 11,000 feet long, and would enter the North Fork canyon from 500 to 700 feet above the bed of the latter river. The estimated cost of this tunnel is between $250,000 and $300,000. By means of such an outlet the accumulated tailings in Bear River canyon, which amount to many millions of cubic yards, could be washed out, and according to the estimate of a competent engineer, these tailings alone contain from $25,000,000 to $30,000,000. Thus this project not only affords a solution to the Bear River debris question, but opens up at the same time one of the most extensive mining enterprises in the world. It is suggested that such undertaking would not necessarily interfere with the rights of ditch owners who divert their water from Bear river below this point, as in the summer time when no mining is going on the tunnel could be stopped and all the water retained in the Bear River channel for the benefit of these ditches, and in the winter, when water is plenty, enough could be diverted from the tunnel and sent on down the old channel to keep the ditches full. Another point, however, might seem more difficult to overcome, and that is the objection which Sacramento and the people on the American river would naturally interpose to any project which threatened to heap on their shoulders, as it were, in addition to their present burdens in the debris line, the accumulations which now weigh so heavily on the farmers of Bear river. This objection it is proposed to meet by the construction of a dam high enough and strong enough in the North Fork canyon, at a point below Colfax, to hold all the debris that would ever be conveyed in that channel through the proposed tunnel. Such a dam as would be necessary, it is thought, can be constructed at a comparatively small cost, by tunneling into the side of the gorge, at a point where the canyon sides are precipitous, and then by means of sufficient powder fired by electricity, blow the whole side of the mountain down into the river. This plan is original and novel, and yet old miners accustomed to heavy blasting pronounce it entirely practical. A dam thus formed would be superior in strength to anything constructed by tamer means, as it would be composed entirely of rocks, many of which would be so massive that no ordinary body of water could move them. The project is a stupendous one, but if it can be made successful, and we believe it can, it will virtually solve the debris difficulty, so far as relates to Bear river and the North Fork, and at the same time open up additional mining enterprises, compared with which the largest gravel mines now known would be but small affairs.—*Placer Herald.*

FROM a yield of $100,000 in bullion in 1865 the Georgia gold fields have advanced to $1,000,000 per annum, with a promise of large returns this year.

GREAT activity is apparent in the German iron and coal trades.

Desulphurizing Pyritous Ores.

A slow roasting of the ores at a dull, cherry-red heat partially accomplishes the removal of the sulphur, but it still allows a sufficient quantity to remain, to prove detrimental to a perfect desulphurization. This evil is felt in the working of lead and copper ores; it is still more apparent in the reduction of iron ores, and it produces disastrous results in the amalgamation of gold ores.

In the reduction of iron ores, if the sulphur is not entirely removed, it renders the iron brittle. In working gold ores the presence of the sulphur prevents, to a marked extent, the disintegration of the gold by the quicksilver, which forms the amalgam.

Among the iron workers a method of overcoming the difficulty has been earnestly sought for, but has not yet been found. The iron deteriorates in quality in proportion to the amount of sulphur combined with it. They have used a basic slag with good effect in absorbing the sulphur, but it has not accomplished the perfect extraction of it from the iron.

It requires more oxygen to overcome the presence of the sulphur than it can obtain by an ordinary roasting process. To provide for its complete removal from the ore, it must be brought into contact with an excess of oxygen, and any substance which can yield this excess, will affect the desired result. Nature has placed such a substance in the reach of all miners. It is to be found in every section of the world, and if not in every mining camp, it certainly can be procured in the near vicinity of all of them. This is the common limestone, which is, chemically speaking, an oxide of calcium. If, therefore, in the roasting process of ores containing sulphur, a liberal quantity of limestone is mixed and roasted with them—care being taken to keep the heat within the limits of a dull cherry-red—the reaction upon the limestone will liberate the required oxygen and the combustion of the sulphur will be perfected.

The carbonate of the oxide of calcium, or burnt lime, as it is popularly termed, will not interfere with the after process of either smelting or amalgamating, but will, in reality, rather facilitate the operation of both of them. The ore and the limestone should be crushed to a fine powder and thoroughly intermixed before being roasted. They should be freely raked while roasting.

Tulare Lake Water Alkaline.

Prof. Hilgard informs us that since his announcement at the December meeting of the Horticultural Society, of the alkaline quality of Tulare lake water, he has accurately determined the matter in solution in the water, and finds it far more alkaline than preliminary tests led him to suppose. He finds now that there are 84 grains of mineral salts dissolved in each U. S. standard gallon of water, and that 31 grains are carbonate of soda, the balance being chiefly common salt and glauber salts. In potable well water the largest amount of mineral salts is about 15 grains to the gallon, and in ordinary river water from 8 to 12 grains is the highest. Thus it appears than in Tulare lake water there is not only six or seven times as much mineral matter in solution as in well or river water, but the matter is wholly different in the lake water, being in great part of caustic alkaline character, and destructive to plant life. This water, although its alkaline salts could be neutralized by the use of gypsum, would require large amounts of the latter, say about 150 pounds of gypsum for every inch depth of water put upon an acre, or 1,500 pounds per acre, if ten inches of water were applied to irrigation. Even with this treatment it would not do to put on so much water and allow it to evaporate from the surface, because of the deposits of salts which would take place, and even with the remedy suggested there would have to be drainage planned, and perhaps more water applied to wash out the objectionable matter from the soil. Thus it clearly appears that there are chemical as well as engineering problems to be considered in irrigation schemes, and it is fortunate that the College of Agriculture has called attention to the Tulare lake water before the public money was devoted to carrying out an enterprise which might be a triumph from an engineering point of view, and yet worse than useless to the agriculture of the region. Of course we do not say that this would ultimately be the case if the West Side scheme were carried out, for the rivers emptying into the lake may be wholesome, and the alkaline supply of the lake be guarded against. But this and all correlative points must yet be determined, and it is plain that the inquiry must take a wider range than heretofore supposed before the investment on the part of the public can be considered a safe one.—*Pacific Rural Press.*

NEW TARIFF ON ORES.—The reduced tariff on ores on the Southern Pacific railroad, which went into effect on the 1st of January, is as follows: Ore not worth over $100 per ton is $12 per ton from Casa Grande to San Francisco; for ore worth over $100 per ton 2% additional will be charged on the increased valuation. These are very low rates, and we have no doubt our miners will avail themselves of the low tariff. We have already heard of quite a number who contemplate making extensive shipments as soon as the road reaches the city.—*Arizona Star, Jan. 15.*

MECHANICAL PROGRESS.

Tempering Steel Springs.

Tempering to impart to steel its maximum of elasticity, is a branch of the art requiring, to obtain the best results, the most expert of manipulation. This is especially the case where the springs are subject to severe strains in proportion to their dimensions, while at the same time subject to vibrations. Under these conditions the least degree of undue hardness causes a spring to break, while undue softness causes it to bend to a permanent set, thus altering its normal form. For instance, if a spiral spring, whose coils are distended by force applied at the ends, "sets," the coils, when released from distention, will not approach each other to the distance they did before distention, the amount of difference being the amount of the "set." Or, if the coils were compressed and failed when released to resume their natural positions relative to each other before compression, the spring has "set." Hence the relation between the length, breadth and thickness of a spring, and the nature and amount of its duty are vital elements in estimating the quality of its temper.

The commonest method of spring tempering consists in first hardening the steel, and then blazing it off by heating it in connection with some fatty combustible compound, which will take fire and blaze when it has acquired a certain temperature, it being found that the temperature at which heavy oils, tallow, etc., take fire is about that necessary to reduce a well-hardened spring to the degree of temper imparting to steel its greatest elasticity.

Here we have two separate operations, hardening and tempering; and to avoid this, and temper at once, without the intervention of hardening, is an object of great importance. It has been accomplished, however, in several cases. Thus, one of our largest spring manufacturers tempers spiral springs as follows: They use Gregory's crucible steel, heating it in a furnace burning gas coke, but the furnace has a return flue and heating chambers, and ovens between the flues, the heat passing through the brick-work forming the flues into the ovens. To facilitate renewing the ovens (which, of course, also renewe the flues), the floor of each oven (which forms the ceiling of the oven below), is built on iron supports, protected by the brick-work and suitable fire clay, the bricks all being made to pattern, thus involving very little labor in building. The furnace doors are at the ends, and are kept closed as much as possible. In this way the steel has no contact with the products of combustion of the fuel, and the air is excluded as far as practicable (two valuable features). The furnaces are long and narrow, and not being connected with the flue there is but little disposition for the cold air to rush in when the furnace doors are opened.

The hardening and tempering of springs whose coils are of thick cross-section is performed at one operation as follows: The springs are heated in the furnace or oven described, and are first immersed for a certain period in a tank containing fish oil (obtained from the fish "moss bunker," and termed "straights"), and are then removed and cooled in a tank of water. The period of immersion in the oil is governed solely by the operator's judgment depending upon the thickness of the cross-section of the spring coil, or, in other words, the diameter of the round steel of which the spring is made. The following, however, are examples:

Number of coils in spring	5¾
Length of the spring	6 inches
Outside diameter of coils	4¾ "
Diameter of steel	1 inch.

The spring was immersed in the oil and slowly swung back and forth for 28 seconds, having been given 35 swings during that time. Upon removal from the oil the spring took fire, was redipped for one second, and then put in the cold-water tank to cool off.

Of the same springs the following also are examples:

Example.	Time of immersion in oil.	Number of swings in oil.
Second	36 seconds.	46
Third	27 "	36
Fourth	33 "	40

SIZE OF SPRINGS.

Number of coils in the springs	6
Length of the springs	9 inches.
Inside diameter of coils	3¼
Size of steel	1×1½ square.

Example.	Time of immersion in oil.	Number of swings in oil.
First	9 seconds.	12
Second	8 "	12
Third	8 "	12
Fourth	9 "	12
Fifth	9 "	12
Sixth	9 "	12

To keep the tempering oil cool and at an even temperature, the tank of fish-oil was in a second or outer tank containing water, a circulation of the latter being maintained by a pump. The swinging of the coils causes a circulation of the oil, while at the same time it hastens the cooling of the spring. The water tank was kept cool by a constant stream and overflow.

If a spring, upon being taken from the oil, took fire, it was again immersed as in the first example.

In this, as in all other similar processes, resin and pitch are sometimes added to the oil to increase its hardening capacity if necessary.

The test to which these springs were subjected was to compress them until the coils touched each other, measuring the hight of the spring after each test, and continuing the operation until at two consecutive tests the spring came back to its hight before the two respective compressions. The amount of set under these condition is found to vary from three-eighths of an inch, in comparatively weak, to seven-eighths of an inch for large, stiff ones.—*Joshua Rose, M. E., in Wheelwright and Blacksmith.*

Machine Work in English Shops.

Mr. Wilson Hartwell, in a paper read at a meeting of the Leeds Association, recently, discussed the necessity of measuring from time to time the performance of the tools and machinery for producing engineers' work, and gives some very interesting figures shewing what he considers the average standard performance for various descriptions of work, which may be looked upon as representing fairly the work of the best English shops.

One of the most important items of cost is the rate at which the work is tooled. This rate depends more upon the extent of the surface than upon the quantity of material to be removed. For in most cases it can be removed at one cut, and the speed of cut is not much affected by the depth. Where two cuts are needed, the finishing cut should be as light as possible, with a broader advance.

For comparing the time required to tool various surfaces, it is necessary to reduce it in each case to the same unit of surface and of time, such as the number of minutes required for tooling a square inch or a square foot, or the number of square feet or inches done in an hour. The numbers thus deduced have a constant value for all work tooled at the same speed with the same width of cut, and hence are called "constants."

Constants, therefore, furnish the readiest means for estimating the time required to tool similar surfaces similarly situated, but of different dimensions. In choosing a constant for office purposes, such as for estimating, arranging piecework, etc., the time in minutes required to tool a square inch would do as well as any other. But for practical use in the workshop, where rapid mental calculations are required, these constants are too small in value, and involve the use of numbers too high to be convenient. A more useful constant is the number of square feet that can be tooled in one hour; such are those shown on all the tables.

The best way to ascertain constants is to note the speed of cutting and the number of such cuts per inch in width. To find the area in feet tooled per hour, divide five times the speed by the number of cuts per inch. The "advance," or the number of cuts per inch, should be observed by actually counting the cuts in one inch, or fraction of an inch. (If the advance be too fine to be readily counted, it is too fine for ordinary work, and should be altered.) The speed in feet per minute equals five times the speed in inches per minute. The actual speeds vary much in practice, but the ordinary variations are far greater than necessity requires. In cutting wrought iron it will be readily admitted that a speed of 15 feet a minute can be maintained under nearly all circumstances; 20 feet will perhaps be admitted; 30 feet probably denied. The speed is chiefly limited because the tool gets warm. With an abundant stream of soapy water supplied by means of a pump, 30 feet has been maintained; with water supplied under the cutting edge, 45 feet in a short experiment; with heavy tools and a jet of water 1-16 inch in diameter, supplied from the town water works under pressure, 20 feet to 25 feet per minute. The ordinary lathe, with ordinary conveniences, however, has a speed of 20 feet per minute. For cast iron, 16 feet per minute may be assumed.

The advance varies from 1-16 to 1-80 on small work, often simply at the whim of the turner or the chance accident of the feed gear. The greatest loss of time is due to using an advance much finer than repeated experience has shown to be necessary. All roughing work above 3 inches in diameter, with a second cut to follow, can be done at one-eighth inch advance. If the work is to be finished at one cut the 1-16 inch advance could be used for all sizes above 2 inch, but 1-16 inch to 3 inch, 1-24 inch to 2 inch, and 1-32 inch under 2 inch has been taken.

THAT SOUTH AUSTRALIA HARVESTER PRIZE. We have not heard much of late concerning the competition for the $20,000 offered by the South Australian government for a single machine that would successfully cut and thresh grain at one operation. We notice that a writer in the Adelaide *Observer* takes the ground that at least six animals would be requisite for drawing such a machine, and that "the weight and power of even five horses is a serious matter. They batter the ground badly and are expensive, etc." We would like to know what the South Australians expect. This correspondent talks as though by combining a reaper and thresher, there ought to be such power gained that half the animals required on the two would suffice. This is rather out of the line of mechanical experience. Our operators of combined headers and threshers use a score of horses or mules, and yet think they have money over the old way of harvesting. If our South Sea neighbors are so prejudiced against horse power, they had better go back to the cradle and flail, and put their prize money out at interest.

MOTIONS OF THE GROUND.—It will be remembered that M. Plantamour directed attention some time since to certain displacements of the bubble in a fixed spirit level, indicating movements of the ground. He has now made a year's observations of these phenomena in a cellar at Secheron, with two spirit levels, one directed north and south, the other east and west. The result is the manifestation of periodic movements of rise and sinking of the ground, which, in a general way, appear to be determined by the exterior temperature. After that the configuration, and, perhaps, also the nature of the ground, probably affect the intensity of the movements.

ALUMINIUM TELEGRAPH WIRES. — German telegraph engineers have lately been experimenting with aluminium as a material for telegraph wires. This metal can easily be drawn out to a very much finer gauge than is possible with iron, and its conductibility is twice as great as that of iron wire. Its excessive cost has hitherto prevented its use for the purpose indicated, but it is found that an alloy of aluminium and iron can easily be made, which will produce a wire both finer and stronger, and less susceptible to atmospheric changes than iron wire, while it is much superior as a conducting medium.

PREPARING STEEL.—A novel mode of preparing steel has been suggested by Signor Guido, an Italian engineer. It consists in electrolyzing water by means of a dynamo-machine, and smelting the carboniferous ore by reducing it with the oxygen and hydrogen gas obtained, and thus producing either steel or pure malleable iron at will. To turn out two tons daily would, however, require the constant use of a 120-horse power engine.

SCIENTIFIC PROGRESS.

Artificial Gems.

Dr. Percy writes to the London *Times* with regard to Mr. Maclean's alleged discovery: "I agree with Mr. Maskelyne in thinking there is reason to expect that the diamond will some day be artificially produced. But, if so, possibly a very long period will be required to form a crystal of sufficient size and quality to be of any commercial value. Alumina, the substance of sapphire and ruby, has long ago been crystallized, yet to this day no artificial sapphire or ruby worth a farthing has appeared in the market. The balas ruby, or red spinel, was formed about forty years ago by Ebelmen, in small but distinct crystals, of which I have specimens in my collection; yet, so far as I am aware, the natural gem is alone known to jewelers. The conditions under which nature has crystallized carbon in the cubical system must be extraordinarily rare, seeing that a small room would probably suffice to contain all the diamonds that have hitherto been discovered. The possessors of diamonds have not at present any reason to fear that the value of their property will be lowered by the crystallized carbon of the chemical laboratory."

In reply to Mr. Story-Maskelyne's letter on this subject, referred to in last week's *Iron*, Mr. McTear says: "I have just seen Mr. Maskelyne's letter in the *Times*, and am surprised to learn first from it of the negative results Mr. Maskelyne has obtained, while an interview between us, fixed by him for Tuesday, 6th inst., is still pending. The statements in his letter do not prevent me from affirming in the most positive manner that I have been able to produce carbon in the diamond modification. I have been able on the only two occasions I have tried the experiment to burn the small translucent particles in oxygen gas, and I have been able with the greatest ease to scratch deeply both amethyst and topaz with them. As I do not despair of convincing Mr. Maskelyne himself of his being, to say the least of it, premature in his conclusions as to the problem of crystallization of carbon having been successfully solved, and as it has been accomplished by means very similar to those which in the concluding paragraph of his letter he suggests as being possible, I trust the scientific world will suspend their judgment until more ample evidence has been laid before them." At a recent meeting of the Glasgow Philosophical Society, St. John Vincent Day read a communication from Mr. Robert Baxter, of Dundee, regarding the production of artificial diamonds. Mr. Baxter began to experiment in 1876, but did not obtain successful results till April, 1877, when pure crystals of carbon were produced. The crystals then obtained were all lost through careless handling. Mr. Baxter endeavored to procure more, but for several months did not succeed. His crystals had been tested in a manner leaving no doubt about their genuineness. He had tried without success to produce large crystals, but saw no reason to prevent their ultimate production.

MAGNESIUM STEEL.—A half per cent. of magnesium changes coarse-grained into fine-grained steel and greatly improves the quality. The magnesium is introduced through an opening in the cover of the crucible, after inserting some small bits of charcoal, in order to remove the free oxygen. Without this precaution there would be danger of an explosion.—*Ber. der Chem. Gesell.*

A NEW PHOTO-PRINTING PROCESS.—M. Leon Vidal, in a letter to the *Photographic News*, says: Since I have had occasion to mention the name—a name never to be forgotten—of Poitevin, I should like to say a word on that gentleman's special process depending on the action of light on a layer of gelatine made insoluble by the following solution: Water, 100 cub. cents; iron perchloride, 3 grammes; tartaric acid, 1 gramme. Gelatine, with which this solution is incorporated, is insoluble, but ceases to be so in those parts where light is able to act by reducing to its natural state the iron compound. I have not myself been able to make experiments on the very interesting reaction here indicated; but as it has been published by a man whose assertion on such a point it would be impossible to doubt, I can at once see very important results that follow from it. I can foresee here a means of producing carbon papers for special purposes, these could be sensitized from the very first, for all that is requisite is to have insoluble pellicles of pigmented gelatine, stored in a dry and dark place, where they could be kept for a long time without detriment.

A NEW ELEMENT.—Tellef Dahl has found a new element, which he calls *norwegium* (Ng.), in a compound of arseniuret of nickel and nickel glance. It is white, somewhat malleable, of copper-like hardness, melting at a red heat, density 9.44. It dissolves with difficulty in hydrochloric acid or sulphuric acid, easily in nitric acid. The solution is blue, becoming green if diluted with water. Two specimens gave an atomic weight of 145.95. It is precipitated by caustic potash, ammonia and carbonate of soda; the green precipitate is soluble in all these reagents and gives blue solutions. Sulphureted hydrogen gives, even in very acid solutions, a brown precipitate insoluble in sulphuret of ammonia. Borax, in the oxidizing flame, gives a yellowish green globe, becoming blue in cooling. The blue color is shown in the reducing flame. It is easily reducible with carbonate of soda, or upon carbon.—*Comptes Rendus.*

THE DIFFUSION OF GASES.—Testing the diffusion of gases through collodion membrane may be done in the following manner: A piece of collodion balloon is fastened over the top of a funnel, which is then inverted and connected by a bent glass tube with a V-tube, into the bend of which is melted a piece of platinum wire. A little mercury is poured into the V-tube, and a second wire is arranged so as almost to touch the surface of the mercury. On connecting these wires with the two poles of a battery, no current will pass. The inverted funnel is now brought into a vessel of carbonic acid, when this gas slowly diffuses into the funnel through the collodion membrane. In five or ten minutes the pressure on the mercury will have raised it sufficiently to close the circuit, which can be made to ring an electric bell, or announce itself by heating a fine platinum wire.

ELECTROLYSIS IN SODA MANUFACTURE.—M. Merle, the manufacturer of the chemical works of Merle & Co., has erected electrical machines, which are employed to eliminate, by means of electrolysis, the whole of the iron and other metals, such as lead and arsenic. The separation of these metals is effected very rapidly, in large quantities, at a comparatively small cost. The soda crystals which are obtained from the concentration of the leys are very white, and well adapted to the bleaching of fabrics previous to drying. The manufacture of soda crystals and caustic soda, in the south of France, is very difficult, on account of the high temperature, which makes the mother liquors too rich in carbonate of soda.

URALIUM, A NEW METAL OF THE PLATINUM GROUP.—A. Guyard: As far back as 1869 the author discovered this metal in commercial platinum obtained from Russian ores. Next to silver it is the whitest metal known; its malleability is as great as that of the purest platinum, but its ductility is much greater, and it is almost as soft as lead. Its melting point lies near to that of platinum, and it is not volatile. Its specific gravity is 20.25, and its molecular volume, like those of osmium, platinum and palladium, is 6.25. Its atomic weight has been found to be 187.25. In its chemical properties it is difficult to distinguish from platinum.—*Chem. News.*

INTERESTING DISCOVERY.—Considerable excitement is said to have been caused in Lyons by a discovery which purports to give to flax all the qualities and appearance of silk. It has long been known that silk is soluble, not only in powerful acids, but also in soda and chloride of zinc, and it is said that these qualities are made use of in the new process. A company is being formed with a capital of $6,000,000 for the manufacture of the new textile.

HEAT OF THE ELECTRIC ARC.—Prof. Rosetti, of the University of Padua, has measured the temperatures of the electric arc and of the carbon points. He finds that with 80 Bunsen elements the negative pole measures 4,352° F., the positive pole 5,198° F., and the arc 6,332° F. These temperatures *decrease* with an *increase* in the number of elements employed.

ARTIFICIAL QUARTZ CRYSTALS.—MM. Friedel and Sarrazim have obtained quartz crystals by the action of hydrochloric acid upon gelatinous silica in closed vessels, at a temperature of 350° (662° F.)—*Soc. Chim. de Paris.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 15		Week Ending Jan. 22		Week Ending Jan. 29.		Week Ending Feb. 5.	
Alpha	11½	10	12	10¼	10¾	10½	10	9
Alta	4.05	4⅜	5⅞	4¼	4.85	4	4.60	3.90
Andes	80c	60c	1¼	75c	1.20	90c	1	85c
Alpa								
Argenta	1½	1.40	1½	1¼	1¼	1.10	1.20	90c
Atlantic								
Aurora Tunnel								
Baltimore Con	10½	5⅞	13⅜	9	12⅜	10½	11¼	8⅞
Belcher	1.90	1.40	2	1.70	2	1.80	2.10	1.75
Belmont	75c	65c	75c	60c	60c	40c	50c	
Best & Belcher	13¾	13	14½	13⅜	13¾	11¼	12½	
Bullion	5	4.40	6⅝	5	5⅜	4.80	5	4.40
Bechtel	1.95	1.55	2	1.65	2	1½	2½	2
Belle Isle	1.80	1½	1.90	1.60	1.70	1.20	1.10	75c
Bodie	9	8¾	8¾	7	9	8	12	8¾
Benton	2.80	2.35	3¼	2.40	2.80	2.10	2¾	1.95
Bulwer	13	9½	12	10	11	10½	11	10¼
Boyle								
Black Hawk	85c	60c	1	75c	80c	70c	1	75c
Belvidere	1	75c	1¼	95c	1.10	95c	1½	1.10
Booker	50c	40c	65c	45c	50c	40c	90c	60c
Caledonia	1¾	1½	2¼	1.60	2	1.35	1.50	1.15
California	4.40	3¾	4.40	4.05	4	3.70	4	3.25
Challenge	2.05	1.90	2¼	2	2.30	1.90	1.95	1.60
Confidence	9¼	7¾	9⅜	8	9	8¼	8¼	6¾
Chollar	8¼	8	9	8¼	9	8⅝	8½	7
Confidencia	90c	55c	1	85c	85c	75c	75c	60c
Con Imperial	4.60	4¼	4.90	4.05	4¼	3.80	4.05	3.45
Con Virginia	5¾	3.30	6⅝	5	5¾	5	5¼	3.40
Crown Point	25c		30c		25c		25c	
Con Washoe	20c	10c	50c	25c	60c	25c	75c	35c
Champion								
Concordia								
Dayton								
DeFrees								
Dauey	75c	65c	75c	65c	70c	30c	70c	50c
Day	18	16½	16½	15¾	17	16	16½	16
Eureka Con	3.80	3.10	4.20	3¾	3.70	3	3.15	2.65
Exchequer	50c	35c	60c	45c	40c	30c	40c	
Endowment								
Gen Thomas								
Grand Prize	1.70	1½	1.55	1.40	1.70	1.55	1½	1.30
Gila	15c	5c	15c	10c	10c	5c	10c	5c
Golden Chariot								
Golden Terra	10½	9	10¼		10¾	10	10¼	
Goodsbaw	60c	35c	40c		40c	35c	45c	35c
Gould & Curry	6¾	5¾	7	6¼	6¾	5¾	6¾	4¾
Hale & Norcross	9	8¾	9¾	8¾	8¾	7¾	7¾	6¾
Hillside	2.05	1½	1½		1.65	1½	1½	1.45
Highbridge								
Homestake								
Hussey								
Independence	1.10	75c	90c	75c	90c			
Julia	2.55	2¼	3¼	2.55	2.30	2	2.30	1.60
Justice	2¼	2	3.40	2¼	2.30	2	2¼	2
Jackson	3½							
Joe Scates								
K K Con	5	4¼						
Kentuck	4.10	3.30	4.20	3.90	4	3¼	4	3¾
Kossuth								
Keystone								
Lady Bryan	1.45	40c	3¼	25c	60c	5c	55c	40c
Lady Wash	75c	65c	1.15	80c	1	76c	95c	75c
Leopard	10c		20c	15c	25c	20c	20c	15c
Leviathan	40c		50c	30c	45c	15c	30c	20c
Leeds	80c	60c	75c	50c	60c	40c	40c	35c
Lee								
May Belle	30c	20c	40c	20c	25c	20c	25c	20c
Modoc							35c	
Manhattan			1¾	1.90	1¾	1¾	1.60	
Martin White	1.40	45c	1.40	1¼	1.10	1	1	
McClinton	1	50c	75c	65c	65c	50c	65c	50c
Meadow Valley								
Mexican	21½	19½	19½	17½	19½	18½	18½	14¾
Mides	2½							
Morning Star								
North Con Virginia								
New York	50c	30c	75c	45c	50c	35c	45c	35c
Northern Belle	10½	9¼	9½	9	10¼	9½	12½	10¾
New Coso								
Navajo	40c	35c	40c	35c	40c	35c	35c	30c
Occidental	2.05	1¼	2	1¼	1.30	1	1¼	1¼
Ophir	21	19½	20	17½	19½	18½	18½	16
Oriental	80c	55c	90c	70c	55c	50c	65c	55c
Overman	9¼	7⅜	10	8¼	8¾	7½	7¾	6
Pantber								
Phenix					1¼			
Phil Sheridan								
Potosi	5¾	4	5½	4.90	5¾	4.90	5	4
Prospect								
Raymond & Ely	1	95c	1	60c	1	80c	85c	75c
Richer								
Rock Island								
Rye Patch								
Rough & Ready								
Savage	7¼	6¾	8	7⅜	7¼	6¾	7½	5⅝
Seg Belcher	23½	16	25	21	21	19	22	21¼
Sierra Nevada	22¼	20½	24	20½	23	21½	22¾	18
Silver Hill	90c	75c	2	85c	90c	60c	1.45	55c
Silver King	7	6¼	7¼	6¾	7	6¼	6¾	6¾
Silver Prize								
Succor								
Summit	1¼	1	1.40	1	1.20	1	1.20	1
Scorpion	3.30	3.20	3.95	3.40	3.60	3.20	3.30	3
Solid Silver			50c	25c	50c	30c	40c	35c
South Bodie	20c	15c	25c	15c	25c	20c	70c	30c
South Standard								
Star	25c	15c	30c	20c	35c	30c	30c	25c
St. Louis			50c	15c	25c		30c	15c
Syndicate	1¾		1¾	1¼	1¼	1¾	1¾	1.80
Tioga Con	3.35	2.45	3.40	2.90	3	2.85	3	2.70
Tiptop	4	3¼	3¾	3¼	4	3.55	4¼	4½
Trojan			10c	5c	30c	25c	30c	25c
Union Con	51½	45¼	47	44	49	42¾	43¾	36¾
Utah	12¾	11¼	17¾	12¾	18	15¼	15¾	12
Verumont Con								
Ward	2¼	1.40	2.85	2.40	2¼	1.60	1.90	1.60
Wells-Fargo	10c		15c	10c	15c	10c	15c	10c
Woodville								
White Cloud								
Yellow Jacket	11¾	10¾	13¾	10½	12¾	11	11¾	9

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 30.

120 Alta	4¼@4.40
50 Andes	1
200 Best & Belcher	12@12½
220 Bullion	1
675 Belcher	11¼@10¾
200 Benton	2¼
775 Con Virginia	4.05@4
170 Chollar	8¾
185 California	3.90@4
335 Con Imperial	75c
1680 Crown Point	5¼@5⅝
90 Confidence	8¾
300 Caledonia	1¾@1.60
200 Cosmopolitan	35c
740 C Dorado	2.15@2.05
135 Exchequer	3.10@3.15
50 Essex	2
650 Flowery	25@30c
300 Fairfax	80c
290 Gould & Curry	52@55
150 Golden Gate	2.70
180 Hale & Nor	7¼@7⅜
85 Justice	2¼@2.20
345 Julia	2¼@2 30
20 Kentuck	3.90
820 L Bryan	55@50c
550 Lady Wash	75c
400 Leviathan	25c
120 Mexican	18¾@18½
400 Mackey	10c
450 New York	45@46c
1040 N Bonanza	65@75c
45 Ophir	18
95 Overman	7¼@7⅜
140 Occidental	1.60
170 Potosi	5
185 Savage	7@7¼
220 Sierra Nevada	22¼@22¾
95 Seg Belcher	21¾@22
655 Silver Hill	75@70c
60 Solid Silver	40@35c
5 Utah	15¾
110 Union Con	43¾@43¼
915 Ward	1.90
100 Wells-Fargo	15c
130 Yellow Jacket	11¼@11¾

AFTERNOON SESSION.

275 Argenta	1.05@1
900 Albion	25c
550 Addenda	60@65c
100 Bullion	1
150 Belle Isle	1.10
50 Belvidere	1.10
255 Black Hawk	80@75c
300 Booker	60c
50 Bodie	8¾
160 Bechtel	2@2.15
675 Bulwer	11@10¾
300 Champion	40@35c
300 Caledonia	1.65
200 Day	65@70c
655 Dudley	60c
60 Eureka Con	3.15
800 Endowment	40c
350 E M Diablo	2@1¾
670 Gila	5@10c
100 Grand Prize	1.30
700 Goodshaw	35c
450 Hillside	1¾@1.45
100 Independence	90c
140 Jupiter	90c
30 Kentuck	3.90
630 Metallic	2
725 Mt Potosi	2¼@2.15
50 Mono	8
525 McClinton	50c
335 Mammoth	2.30
150 M White	1¼@1.40
20 Northern Belle	9¾
100 Navajo	35c
150 N Nooday	3
250 Nooday	4¼
760 Oriental	60c
200 Oro	35c
350 Queen Bee	25c
60 Real del Monte	1.10@1¼
300 Ray'd & Ely	85c
200 Star	30c
1205 S Bodie	3¼@3
240 Syndicate	1.60@1¾
80 Summit	1@1.05
25 Silver King	6¾
200 S Nooday	1.90
325 Tiptop	4¼@4½
100 Vortex	10c
70 Wales	3.10

Saturday A.M., Jan. 31.

140 Alta	4¼
300 Andes	85c
10 Alpha	10
110 Atlas	10c
1035 Argenta	1¼@1.20
650 Albion	25c
1680 Belcher	2¼@2.35
535 Belcher	11¼@11
690 Bullion	5⅝
115 Best & Belcher	11¾@11¾
275 Belle Isle	1.05@1
50 Boston	1¼
165 Bechtel	60@65c
220 Belmont	50c
100 Bodie	8¾@8¾
210 Black Hawk	80@75c
75 Bulwer	10
150 Belcher	1.10
100 Champion	40c
50 C Pacific	4¼
575 Con Imperial	75@70c
100 Challenge	1.90
240 Caledonia	1.45@1¼
150 Con Dorado	2.10
230 Day	2
1460 E M Diablo	1.70@1.60
220 Exchequer	3.05@3¼
100 Essex	2@2¼
95 Eureka Con	3.15
800 Endowment	40c
60 Golden Gate	2.70
225 Gould & Curry	5¼@5⅜
200 Golden Terra	10¾
500 Goodshaw	35c
195 H & Norcross	7¼
200 Hillside	1.50
300 Independence	90c
270 Justice	2.05@2.10
230 Julia	2.05@2.10
100 Jupiter	1
50 Kentuck	4
100 K N Bonanza	1.70
50 Leopard	20c
630 Lady Bryan	55@50c
200 Leviathan	30c
190 L Wash	75c
350 Mackey	10
270 Mexican	18@17¾
290 Mammoth	2@2.85
300 M White	1
20 Mono	8¼
1110 Modoc	35c
60 Mt Diablo	20
565 Mt Potosi	2¼@2
830 Metallic	2
10 Northern Belle	10¼
50 Nooday	4¼
40 N Nooday	2.90
2494 N Bonanza	75@70c
510 New York	50c
400 Navajo	30c
225 Occidental	1.60@1.70
300 O Gold Hill	45@35c
185 Ophir	18¾
290 Overman	7¼@7⅜
550 Oriental	60c
160 Potosi	4.90@4.95
100 Paradise	90c
500 Queen Bee	25c
20 Raymond & E	60c
90 Savage	6¾@6¾
95 Seg Belcher	22@21¾
100 Scorpion	3¼@3.30
100 Solid Silver	40c
1150 Silver Hill	70@55c
660 Sierra Nevada	22¼@22
75 Syndicate	1.70
400 St Louis	5c
400 Star	25c
1050 South Bodie	40@60c
300 Silver King	6¾
555 S Bulwer	11¼@11
100 S Nooday	1.90
130 Summit	1
100 Tioga	2¾
80 Tuscarora	15c
1825 Tiptop	4.30@4¼
300 Trojan	30@25c
620 Union Con	43¼@43
85 Utah	15¼
200 Wells-Fargo	10c
115 Ward	1.90@1.80
470 Wales	3@3.10
90 Yellow Jacket	10¾

Monday A. M., Feb. 2.

30 Alpha	10¢⅝
70 Alta	4@4.10
455 Andes	90c@1
320 Best & Belcher	11¼@11¾
1545 Belcher	10¢@10¾
730 Bullion	5¢@4.95
75 Benton	2.30
235 California	3.95@3.85
250 Con Virginia	4@3.95
490 Chollar	7¾@7¼
385 Crown Point	36¢⅝
140 Con Imperial	70¢@65¢
115 Confidence	8¢@8¼
350 Caledonia	1¼@1.30
2050 C Dorado	1.9¢@2.10
210 Exchequer	3
150 Essex	2
100 Flowery	30c
345 Gould & Curry	5
100 Golden Gate	2.65
250 Hale & Nor	7¼@7¾
120 Justice	2.15@2.20
235 Julia	2.20
480 Lady Bryan	50c
200 Leviathan	25c
100 Lady Wash	80c
50 Mackey	5c
1050 Mexican	17¾@17
245 N Bonanza	77¢@70¢
250 New York	45c
150 Occidental	1¾
25 Overman	6¾
180 Ophir	18¾@18½
1200 Potosi	4¼@4
90 Savage	6¾
1020 Silver Hill	1¼@1.20
455 Scorpion	3¼@3.15
150 Seg Belcher	18@20
735 Sierra Nevada	20¾@21
85 Utah	15¢@14
1125 Union Con	42¢@41
20 Ward	1.60
1050 Wells-Fargo	10¢
120 Yellow Jacket	10¾@10¼

AFTERNOON SESSION.

600 Addenda	15c
230 Addenda	60c
1815 Argenta	1.10@1
255 Belmont	50c
250 Bodie	10¼@10¾
205 Bulwer	10¾
110 Bechtel	2.20
425 Belle Isle	1@1.05
525 Boston	1¼
800 Booker	70c
130 Black Hawk	75@80c
300 Belvidere	1.10
980 Champion	50@60c
240 C Pacific	4¼
50 Caledonia (BH)	3
200 Dudley	60@65c
300 D Staudard	25c
200 Day	60c@70
1155 E M Diablo	2@1.95
100 Endowment	40c
45 Eureka Con	16¼
500 Gila	5c
900 Gould & Curry	4¾@4¾
270 Grand Prize	1@1.40
195 Independence	90@95c
385 Jupiter	1@1.05
35 Leopard	20c
30 Leeds	40c
395 Mammoth	2.85
300 Modoc	35c
300 McClinton	60c
530 Metallic	1.90@1¼
100 Mt Potosi	2¼
100 Mt Diablo	20@20¼
150 M White	80@1
345 Mono	9½@9¾
95 N Belle Is	30c
75 Silver King	6½
200 Summit	1.15
555 Syndicate	1¼@1.65
850 Oriental	55c
1200 Oro	40@30c
875 Queen Bee	25c
160 Real del Monte	1.40
50 Star	25c
1315 S Bulwer	2¼@2¼
100 S Nooday	1.90
75 Silver King	6½
200 Summit	1.15
555 Syndicate	1¼@1.65
1735 S Bodie	70@60c
700 Tioga Con	2.70
410 Tiptop	4.45@4.40
120 Bullion	4.90
1420 Belcher	10¾
255 Best & Belcher	10¾@10½
235 Benton	2@2.15
330 Con Virginia	3.90@3.85
215 Chollar	7¾
545 Crown Point	5@4.90
235 California	3.90
150 Con Washoe	25c
100 Con Dorado	2.10
150 Confidence	7¾@7¼
230 Con Imperial	65@70c
200 Challenge	1.95@1.85
335 Caledonia	1¼@1.15
100 Eascx	2
400 Flowery	30c
330 Gould & Curry	5¼@5⅜
140 Golden Gate	2.60@2.70
160 H & Norcross	7¼@7⅜
150 Justice	2.05@2.10
275 Julia	2
200 Kentuck	3¾
240 Lady Wash	80@75c
200 Leviathan	25c
330 Mexican	17@17¼
340 Mackey	25@20c
100 N Bonanza	70c
350 New York	45c
200 Occidental	1.70
205 Ophir	18@17¾
95 Overman	7
795 Potosi	4¼
250 Sol Silver	35c
340 Scorpion	3.10@3¼
880 Silver Hill	1.15@1¼
130 Savage	6¾
745 Sierra Nevada	21@20¾
185 Utah	14@15
10 Ward	1¾
1700 Wells-Fargo	10@15c
70 Yellow Jacket	10¼@10¼

AFTERNOON SESSION.

1390 N Bonanza	70@60c
575 Addenda	65@60c
1100 Albion	25c
50 Belmont	50c
140 Bulwer	10¾
140 Booker	30@30c
885 Black Hawk	70@75c
710 Bechtel	2¼@2
330 Belle Isle	1
330 Bodie	12@11¾
235 Boston	1¼@1.30
540 Belvidere	1¼@1.10
1250 Cbampion	70@65c
50 C Pacific	4¼
600 Day	50@55c
550 Dudley	70c
100 D Staudard	40c
885 E M Diablo	2@2¼
5 Eureka Con	16¾
950 Endowment	40c
110 Grand Prize	1¼@1.40
600 Goodshaw	40c
650 Gila	5c
1060 Jupiter	2
210 Mt Potosi	2¼@2.45
300 Modoc	35c
450 McClinton	65c
100 Mt Diablo	20¼
300 Mammoth	2@3
350 Martin White	80c
200 Mono	9¼@8¾
200 May Belle	20c
100 Manhattan	1.60
300 Metallic	1.80@1¾
100 Northern Belle	11¼@12
150 N Nooday	3¾
500 N Belle Is	30c
620 Noonday	4¼@4
240 Navajo	35@30c
1550 Ophir	18¾@18¼
750 Oriental	60c
3050 Queen Bee	25@30c
265 Real del Monte	1¼@1.55
910 Syndicate	1¼
200 Summit	1.15@1.20
1070 Sierra Nevada	21¼@21
90 Golden Gate	2.60
200 Hale & Nor	7¼@7⅜
745 Justice	2@2.85
515 Julia	1.80@1.90
5 Kentuck	3¼
300 Leviathan	25@30c
450 Lady Wash	80@75c
200 L Bryan	50c
745 Mexican	15¾@14¾
725 Mackey	25@20c
305 N Bonanza	60@55c
1170 New York	35@40c
170 Occidental	1
615 Ophir	18@16¾
190 Overman	6@6¼
245 Potosi	4.20@4¼
1660 Silver Hill	1.20@1.30
150 Solid Silver	35c
1040 Savage	6¾@6¾
700 Scorpion	3.05@3
765 Sierra Nevada	18@18¼
100 Trojan	25c
160 Utah	12¾@12
1070 Union Con	37¾@37¼
1070 Wells-Fargo	10c
655 Yellow Jacket	9¼@9

AFTERNOON SESSION.

1380 Argenta	1@95c
750 Atlas	15c
400 Addenda	60@65c
350 Albion	25c
1450 Belvidere	1¼@1¼
200 Bulwer	10¼@10¾
840 Booker	30@35c
705 Belle Isle	90@75c
725 Bodie	9¼@9¾
230 Bechtel	2.30@2¼
405 Black Hawk	90@80c
175 Boston	1.30
2320 Champion	60@75c
75 C Pacific	4¼@4
250 Day	20c
760 Dudley	70@60c
155 Eureka Con	16¼@16¾
500 Endowment	40c
1180 E M Diablo	2
1160 Goodshaw	45c
30 Grand Prize	1.40
500 Gila	5c
600 Independence	90c@1
510 Jupiter	1¼
200 Leeds	35c
100 Leopard	15c
500 Mt Diablo	20¼
100 Mammoth	2¼@3
300 Martin White	80c
250 Mono	8¾
500 M White	1
500 Mammoth	2¼@2.80
250 McClinton	60c
150 Modoc	35c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Jan. 29. Thursd'y A. M., Feb. 5.

380 Andes	90@95c
35 B & Belcher	12¾
3105 Belcher	11¼@12¾
160 Bullion	5@5¼
130 Benton	2.55@2.60
170 Chollar	8¼@8¾
120 Con Virginia	4.10
170 California	3.95
200 Con Imperial	75c
395 Crown Point	5¼@5⅝
60 Confidence	7¾
545 Caledonia	1.60@1¾
590 C Dorado	2.05
150 Dardanelles	75c
365 Exchequer	3.10@3.15
50 Essex	2
30 Flowery	30c
35 Fairfax	65c
100 Gould & Curry	5¾
300 Golden Gate	2.70
155 Hale & Nor	7¼@7⅜
425 Julia	2.20@2
120 Justice	2.20@2¼
20 Kentuck	3¾
705 Lady Bryan	60@55c
655 Lady Wash	80@75c
400 Leviathan	25c
190 Mexican	18¼@18¾
300 Mackey	10c
250 New York	50c
710 N Bonanza	65@70c
180 Ophir	18¼@18¾
190 Overman	8@7¾
490 Potosi	5@4.90
10 Savage	7¼
550 Sierra Nevada	22¼@21¾
15 Seg Belcher	21
270 Silver Hill	80c@90c
135 Scorpion	3.40@3¾
300 Solid Silver	40c
35 Utah	18
280 Union	4@4¼
330 Ward	1.90
350 Yellow Jacket	10¼@10¾

AFTERNOON SESSION.

800 Argenta	1.10
1550 Albion	30@25c
10 Alpha	9
805 Alta	4.40@4.60
330 Andes	85c
195 Best & Belcher	10@9¾
1070 Belcher	9¢@8¾
105 Bullion	5.40
710 Benton	2.60@2¾
850 California	3¾
505 Con Virginia	3¾@3.45
330 Chollar	7¢@7¼
240 Con Imperial	65@60c
60 Confidence	7
370 Crown Point	3.90@3¾
370 Challenge	1.60
170 Caledonia	1.20@1.15
120 Con Dorado	1.95
180 Exchequer	3
50 Essex	2
400 Fairfax	70c
650 Flowery	25c
220 Gould & Curry	4.85@4¾
150 Golden Gate	2.55
890 Hale & Nor	6¢@6¼
590 Justice	2¼@2.20
360 Julia	2
25 Kentuck	3¾
130 Lady Bryan	50@55c
500 Lady Wash	95¢@90c
50 Leviathan	30c
360 Mexican	15¾@15
1200 Mackey	20c
410 New York	45c
200 N Bonanza	70c
225 Ophir	16¼@16¾
20 Overman	6¾
105 Potosi	4.40
325 Savage	6¢@6¾
240 Sierra Nevada	18¾@18¼
670 Silver Hill	1.40@1.45
285 Scorpion	3.10@3
100 Solid Silver	35c
100 S Utah	15c
100 St Louis	10c
1975 Trojan	20c
400 Utah	13¾@13¼
335 Union Con	37¢@37
50 Ward	1.65
100 Wells-Fargo	10c
600 Addenda	60@55c
650 Atlas	20c
1980 Argenta	95c@1
680 Addenda	60c
600 Atlas	15c
700 Albion	25c
40 Bodie	10
150 Beebtel	2¼@2.30
25 Bullion	5
60 Belvidere	1@1.05
200 Black Hawk	95c
50 Boston	1¼
50 Belle Isle	80c
200 Concordia	60c
50 Dudley	1¼
200 C Pacific	4
1625 Champion	70@75c
210 Dudley	60@65c
550 Day	60@60c
100 Endowment	35c
20 Eureka Con	3.17
100 E M Diablo	1.90@1¾
150 Goodshaw	45c
50 Golden Terra	11
250 Gila	5@10c
100 Hillside	1¼
230 Independence	90c@1
100 Jupiter	1¼
200 Leeds	40c
120 Leopard	15c
400 McClinton	60c
100 Mt Diablo	20¼
285 Mt Potosi	2¼@2
20 Mono	9¼
800 May Belle	25c
450 Mammoth	2.90
250 Paradise	75c@80c
1150 Metallic	1¼@1¼
200 Northern Belle	12¼@12¾
280 Navajo	30c
195 Noonday	4
735 S Bulwer	1.90
50 Star	30c
1180 S Bodie	20@25c
1080 Syndicate	1¼@1.60
20 Silver King	6
150 Summit	1.15
195 Tioga Con	2¼@2.55
350 Tiptop	4
270 Wales	3.10@3.40

275 Yellow Jacket	9@9¼

AFTERNOON SESSION.

1980 Argenta	95c@1
680 Addenda	60c
700 Albion	25c
40 Bodie	10
150 Beebtel	2¼@2.30
25 Bullion	5
100 Belmont	50c
200 Black Hawk	95c
50 Boston	1¼
25 C Pacific	4¼
250 Day	60c@65c
50 Dudley	1¼
200 C Pacific	4
1425 Champion	70@75c
210 Dudley	60@65c
550 Day	60@60c
100 Endowment	35c
20 Eureka Con	3.17
100 E M Diablo	1.90@1¾
150 Goodshaw	45c
50 Golden Terra	11
250 Gila	5@10c
100 Hillside	1¼
230 Independence	90c@1
100 Jupiter	1¼
200 Leeds	40c
120 Leopard	15c
400 McClinton	60c
100 Mt Diablo	20¼
285 Mt Potosi	2¼@2
20 Mono	9¼
800 May Belle	25c
450 Mammoth	2.90
250 Paradise	75c@80c
1150 Metallic	1¼@1¼
200 Northern Belle	12¼@12¾
280 Navajo	30c
195 Noonday	4
735 S Bulwer	1.90
50 Star	30c
1180 S Bodie	20@25c
1080 Syndicate	1¼@1.60
20 Silver King	6
150 Summit	1.15
195 Tioga Con	2¼@2.55
350 Tiptop	4
270 Wales	3.10@3.40

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	16	50	Dec 18	Jan 22	Feb 10	W H Watson	302 Montgomery st
Andes S M Co	Nevada	13	25	Dec 18	Jan 23	Feb 16	B Burris	Nevada Block
Bechtel Con M Co	California	4	25	Dec 22	Jan 30	Feb 9	W H Lent	Nevada Block
Belcher S M Co	Nevada	21	1 00	Jan 29	Mar 3	Mar 25	J Crockett	203 Bush

200 Julia	11@1.85	60 Chollar	7@71
100 Mexican	12@14	150 Con Imperial	9c
50 Overman	6	100 Crown Point	3.80@4
170 Ophir	16@16	50 Con Virginia	3.55
200 Potosi	4@4.10	10 Hale & Nor	6
630 Silver Hill	1.30@1.20	150 Justice	2.15@2
350 S Nevada	18@17	60 Lady Wash	80c
30 Savage	2	100 Mammoth	2.20
30 Union Con	37@37	10 Mexican	15
10 Utah	12	200 Mono	8
30 Yellow Jacket	9@9	100 Northern Belle	12
AFTERNOON SESSION.		440 New York	50@44c
10 Alpha	9	40 Ophir	16@16
90 Alta	4	40 Sierra Nevada	18@16
10 Best & Belcher	10	100 S Bodie	60c
155 Benton	2.30@2	110 Silver Hill	1.35
130 Belcher	9@9	160 Summit	1.20
120 Bodie	9	60 Tioga	3

California Board—Latest Sales.

Wed'sday A. M., Feb. 4.		20 Union	39
1100 Atlantic	10c	100 Ward	1.60
30 Alta	5	AFTERNOON SESSION.	
1000 Adna	5c	300 Atlantic	9c
75 Andes	85c	2600 Adna	5c
65 Belcher	9@9	125 Alta	4.40@4
50 Bullion	4.65@4.80	900 Black Hawk	30@25c
20 California	3	90 Belcher	9@9
20 Con Virginia	3.80@3.85	40 Bullion	4.80
200 Con Imperial	65c	70 California	3.65
30 Crown Point	3.95@3.90	300 Con Imperial	62@60c
20 Chollar	7	50 Crown Point	3.80@3.85
30 Caledonia	1.15	20 Challenge	1.90
30 Exchequer	2.80@2	120 Caledonia	1.15
40 Justice	2.05@1.95	100 Enterprise	1
100 Leviathan	30c	20 Julia	2.10
420 Lady Wash	80c	230 Justice	2@2.20
30 Mexican	16@16	420 Lady Wash	80@90c
300 Mint	70@85c	100 Leviathan	27c
200 New York	53c	500 New York	45@44c
20 Ophir	17@17	20 Ophir	16
20 Overman	6.40	20 S Bodie	60c
20 Potosi	4.20@4.15	200 S Utah	12c
200 S Utah	12c	20 Sierra Nevada	18
20 Savage	3	150 Silver Hill	1.30@1.40
20 Sierra Nevada	18	20 Union	38
40 Silver Hill	1.45@1.40	20 Ward	1.65
20 Utah	12	10 Yellow Jacket	10

Mining Share Market.

The inactivity that prevailed during the preceding week has extended into the present one. The sales have been light and with no prominent change in prices. There has been nothing to even ripple the surface, it has continued calm and quiet.

From all the mining districts the output of bullion is very encouraging; it is decidedly improving and the prospects are that the favorable state of the yield will continue for a long time to come.

The Solid Silver G. & S. M. Co. have declared a stock dividend of 10%, payable on and after February 15th. The Assembly Committee on Mines and Mining have agreed to report favorably on Gorley's bill regulating the sale of mining stock.

Novelties in a Novel Location.

Close under the Sierra Madre mountains, a rugged, precipitous range 13 miles east of Los Angeles, we were recently pleased to find a model machine shop, small in dimensions, but containing machinery remarkable for its perfection. It is owned by Mr. J. C. Davis and operated by Mr. J. K. Bigelow, late of San Francisco and formerly of the Springfield, Ill., watch factory. Here the models and working machinery are made for manufacturing Davis' now style of cigarettes. An upright tubular boiler and a two-horse power cugine supply the locomotion. A Pratt & Whitney lathe, a small planer, a hench lathe of hardened steel with numerous adjustable attachments for a variety of fine work and specialties, are among the equipments of this "gem of a workshop." It would be difficult to find more perfect machinery in any American metropolis than Mr. Bigelow completes with his own brain and hand work in this comparatively "out of the way" location. Mr. Davis calls his place Summer Hill—apropos to the fine climate. He owns 2,000 acres, principally mesa or gently sloping hench land. Its altitude places it in the warm or thermal helt, and notwithstanding the severe cold of the present winter, his ten-acre tract of tobacco, now partly in bloom, remains comparatively untouched by frost and steadily hut slowly continues growing. The land is ahundantly supplied with water for irrigating from the adjoining canyon. Oranges, lemons and other tropical fruits grow unsurpassed here; most temperate fruits and vegetables also flourish.

Of tobacco, Mr. Davis grows only the fine Havana in variety, always from imported seed. His plants last the year around, during which period he makes several cuttings. He has an experienced Cuban tobacco-raiser. Sets his plants in March in rows about four feet apart; plants 15 inches; gathers his principal crops in July and Septemher. Irrigates about once in ten days, during spring and summer months. Rates 600 to 700 pounds per acre a fair crop. He considers his soil as specially adapted to this culture, and that equally good land and facilities are limited in California. He has been seven years in bringing his cultivating and curing systems to their present perfection.

Mr. Davis' tobacco house is a well constructed building 32x132 feet in size, and is at present well occupied with the crops of the past year, as he has hut recently commenced selling it, and that in cigarettes only.

Machine Manufactured Cigarettes.

Mr. Davis is the only manufacturer, in America at least, of cigarettes wholly by machinery. The machine used is of his own invention, and is small enough to place in a lady's handbox. It is simple in its operation, but too difficult for us to describe intelligently without engravings. Over 1,000 cigarettes can be made per hour by this machine. When finished one end of each cigarette is inserted in a wooden socket, a perfect mouth-piece, which enables the smoker to obtain the full smoking flavor of the tobacco without any disagreeable or deleterious taste of the natural leaf in the mouth. For this reason the "consumer" will expectorate less, thus adding to comfort and health. We tested samples and can testify to the excellent flavor of Mr. Davis' pure Havana cigarettes. He manufactures none others. We anticipate that his "Cerrito del Yorano" will be the most popular brand of cigarettes in the United States, if not in all foreign countries. He intends soon to place them in the San Francisco market.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Zeile.—*Dispatch*, Jan. 31: Work on the open cut has been stopped, on account of breaking into an old tunnel that had been run from the shaft. The lead was struck and good rock found. A tunnel will be run in the same direction from the 100 level, which will strike the new lead at a lower depth.

Bluxom.—A blast of 5,000 pounds of powder was set off last Monday. The blast was exploded by an electric battery, throwing up about 40,000 cubic yards of dirt.

Commenced Work.—Work has been commenced by Morgan & Co. on the claim they recently purchased from D. Duty, near town, which they intend to thoroughly develop.

Bismarck.—Work was resumed last Monday by Vaughn & Co. This mine is located on Hunt's gulch, between Jackson and the Mokelumne river.

BUTTE.

Armstrong.—Oroville *Register:* The ledge has been tapped by two tunnels, one above the other, which are connected by a shaft. The upper tunnel extends into the hills about 200 ft and the lower one 250 ft, both showing a ledge three ft in thickness. The rock is easily handled and is delivered to the mill at a very small cost. The company has built a fine five-stamp mill, and supplied it with the best and latest improved machinery at a cost of $20,000, and the work of crushing has been going on four weeks. The rock averages $20 per ton.

CALAVERAS.

Banner Mine.—Calaveras *Chronicle*, Jan. 31: We have it from good authority that Mr. C. H. Livingston, of Columbia, who owned the well-known Banner mine, at Glencoe in this county, has sold that property to an Eastern company for $5,000.

INYO.

Taylor's Mines.—*Independent*, Jan. 24: Peter Taylor, of the new reduction works at Beveridge district, was in town yesterday, bringing in the handsomest lot of gold quartz specimens it has ever been our pleasure to look at from that auriferous region. He has nine locations, from one of which, the New Year, he, in less than a day, took from the ledge five tons of ore showing fine gold, which will yield from $500 to $1,000 per ton in gold. The ledge is two ft in width, carrying white quartz flecked with gold, and a stratum of iron oxide assaying high in fine gold. The specimens are undoubtedly rich, and it is evident that Beveridge district is an immense gold field. The arastra will start up soon, with 30 tons of ore on the dump and fine bodies of ore in sight in all the mines. Mr. Taylor expects within the next 60 days to have the stamps running.

Cosmopolitan.—There are 500 tons of ore above ground, estimated to work $100 or more. Some Mexicans, running arastras near there, have contracted to pack down and arastra 500 tons of ore.

MONO.

Standard Con.—Bodie *Free Press*, Jan. 29: The north drift, 385 level, is in from the main crosscut 642 ft. The ledge is four ft wide, of good milling ore. The upraise from this drift is 42 ft above the level, showing a ledge four and a half ft wide of good ore. The south drift from the main crosscut is in 315 ft. The ledge in the face is two ft wide of fine ore. The ledge in the upraise from this drift is three ft wide, and is looking very well. The east crosscut, 200 level, is in 187 ft. The rock in the crosscuts of the 700 level remains unchanged. The main shaft is down below the 700-ft station 64 ft. The north drift on the east ledge, 300 level, is in 227 ft, with a ledge in the face two ft wide, of good milling ore. The south drift from the west crosscut, 300 level, is in 142 ft, showing a ledge three ft wide, of very rich ore. The stopes throughout the mine are looking well. In the north drift, 385 level, the ledge is 20 ft wide, of high-grade ore. In the West Standard stopes the ledge is five ft wide, of rich ore. The ledge in the stopes, 550 level, is 10 ft wide, and is looking well.

Dudley.—The main crosscut, 500 level, is in 214 ft. On Friday last a heavy flow of water was struck, which has interfered with the progress of the work. The water is now held 12 ft below the station, with the pump running at 90 strokes per minute.

Belvidere.—Developments made since last report render it almost certain that the ledge in the 400-ft station is the same as that had in the shaft for 80 ft, between the 300 and 400 levels. The east crosscut has been stopped for the present, and north and south drifts are being pushed on the ledge. The north drift is in 30 ft and the south drift 25 ft from the shaft.

Bulwer Con.—The north drift on the Stonewall ledge is in 30 ft from the winze, showing a ledge 18 inches wide, of good ore. The south drift is in 22 ft. The ledge is two ft wide, and looks well. The north drift on the Ralston ledge is in 29 ft from the tunnel, with a ledge in the face of the drift three ft wide, of good ore. The south drift is in 24 ft. The ledge here is two and a half ft wide, and looks well. Stoping on the Ralston ledge was started during the past week, on the 380 level. The ledge is three and half ft wide, of very fine ore.

Jupiter.—The work of placing the new pumping machinery is progressing. The boilers are in position and the brick work nearly completed. The underground pump work on the 200, 250 and 400 levels is nearly finished.

Noonday.—They are crosscutting east and west on the 400 and 500 levels; both crosscuts are looking well. In the former, several veins of an encouraging character have been cut. Stoping in North Noonday from No. 2 winze, 300 level, and from Noonday vein, 200 level. They are taking out about 100 tons of ore per day.

Boston Con.—Work confined to the 200 level. The east crosscut is passing through a vein formation. Drifting south on the ore vein, which is about two ft wide, and assays $8 to $60.

Tioga.—Still sinking the main shaft, which has attained a depth of 738 ft. When the 800 level is reached, a station will be opened and crosscutting for the ledge commenced. Work of crosscutting from the Ralston winze, on the 620 level, continues. A vein four ft in width has been cut.

Summit.—The north drift, 530 level, has been extended 12 ft; total distance from the shaft, 01 ft. The ledge in the drift is three ft wide. The south drift is in 70 ft, showing a progress for the week of 10 ft. The ledge is two ft wide.

Double Standard.—The north drift from the east crosscut, 200 level, has been extended 13 ft; total length, 90 ft. The south drift, same level, is now in 91 ft.

South Bulwer.—The main shaft is down 482 ft. Winze No. 1 in the south drift, on the 350 level, is down 96 ft. The ledge in the bottom is four ft wide, of very good ore.

Ubo.—The west crosscut is in 101 ft. Formation is favorable. The east crosscut is in 188 ft. The face is in vein porphyry and quartz.

Blackhawk.—The shaft is down 600 ft. The bottom is in black porphyry, with seams of clay. The winze on the Liberty (west) ledge, sunk on an incline with and in the ledge, from the 220 level, is down 45 ft.

Quaker Bee.—The north drift, 400 level, is now in 35 ft. The vein is about seven ft wide, mixed with waste matter, but steadily improves as progress is made north.

South Noonday.—During the past week a whim has been erected over the shaft, and work will be commenced with it to-day. The shaft is down 136 ft, timbered to the bottom, double compartment. At 150 ft a station will be opened and a crosscut run to the Cummings ledge, which was cut in the shaft at a depth of 70 ft.

McClinton.—Bodie *News*, Jan. 29: South drift at new shaft has been extended a distance of 67 ft. West crosscut driven five ft to the west wall. East crosscut has been driven 12 ft, the face still in the ledge. This crosscut will be continued to the east wall, which will strike it at a point 77 ft from the north crosscut, giving them both walls, thus defining the course and direction of the ledge and enabling the company to know the exact distance necessary to be run to reach the ore body below. On the 500 level west crosscut in 207 ft. On the 675 level, north drift, in 74 ft, and the ledge is widening and looks well.

Sonora Con.—Progress during the week passed, eight ft. Crosscut from 100 level now in 83 ft. Rock in face of drift still continues hard.

Mammoth.—Mammoth City *Herald*, Jan. 21: Tunnel No. 3 has a total length of 701 ft. A new crosscut has been started and driven 21 ft. The rock is the same character of rotten quartz reported in our last. In No. 4, or lower tunnel, 20½ ft of rock has been removed, making the entire distance 954 ft.

NEVADA.

Vulcan.—Grass Valley *Union*, Jan. 30: So much water has been encountered in sinking the shaft of the Vulcan mine, on New York hill, that a horse whim cannot handle it and hoist the rock, and in consequence a boiler is being set up to run a steam pump. This work will be completed in a few days, when sinking will be resumed. The upper ledge has been cut through in the shaft, and shows a good quality of quartz carrying gold. The under ledge, which runs from the Ford & McDonald claim on the north (which produced very rich rock) is expected to be encountered in a few feet, and after the steam pump is started it will not be many daye before it is opened upon.

Mining Note.—Dutch Flat *Forum*, Jan. 29: We are informed upon reliable authority that the drift claim formerly owned by Pat. McCann, and situated near Remington hill, has rich pay dirt, averaging $8 per carload. This claim is south of and adjoining the claim owned by A. A. Ferguson and W. H. Hilhouse, of this place.

San Francisco.—Grass Valley *Union*, Jan. 31: Improvements are being made in ore sheds, contracts having been let for building 600 ft more, which workmen are now engaged in constructing. Upon its completion there will be 2,000 ft of ore sheds, capable of affording cover to 16,000 tons of ore, which is burned in piles of about 80 tons each. The company have now so many piles in process of burning that there is a regular and continuous supply of ore furnished for the leaching process, so that a fixed amount of cement copper can be turned out each month. The product of cement copper has been gradually increasing from month to month, until the intended maximum has nearly been reached, which is 45 tons per month. The product last month was 12 tons more than any month since the mine has been operating.

Shady Glen.—Dutch Flat *Forum*, Jan. 29: The last clean-up made not long since by A. Larson, at his claim, at Shady Glen, was better than any preceding one. One of the finest gold specimens we ever saw was left at this office. It is composed of hundreds of fine particles netted together having the appearance of frost-work.

Sargent & Jacobs.—The new shaft at Sargent & Jacobs' gravel claim, at Quaker hill, was connected with the tunnel on Wednesday the 21st inst.

Mining Note.—In the vicinity of Oleta (Fiddletown), a large amount of gold is being taken out of the gulches and ravines thereabouts in a quite unostentatious way by the miners.

PLACER.

Hidden Treasure.—*Herald*, Jan. 31: M. H. Power, Secretary and general manager of the Hidden Treasure Mining Co., Sunny South, called on us while in Auburn last Monday, and from him we learn that the mine is panning out well, and the prospects are encouraging. The main tunnel is in 1,050 ft, and a raise from the extreme point shows undiminished richness in the quality of the gravel. The mine is now giving a regular monthly dividend to the stockholders.

Rainbow.—The Rainbow, a rich drift claim, located in El Dorado canyon, above Sunny South, has been idle for some time for want of water to wash their gravel, but being supplied at present with an abundance, is in full operation and doing well.

Dam.—The Dam, another drift claim, in the same canyon, continues to give employment to its regular force, with satisfactory results.

Derby.—The Derby, owned by Willey, Shane, Lowell, Adams, Bardwell and others, and located about a mile above Sunny South, is being prospected with favorable indications.

Big Gun.—The Big Gun, a hydraulic claim, owned by the Van Emon Bros., at Michigan Bluff, and famed for its age and richness, is running steadily, and doing well.

Item.—Owing to the unusually cold weather, water has run light in the ditches, and the hydraulic mines on the divide, with few exceptions, have been running small heads.

Iowa Hill.—At Iowa Hill the mines have run but little this winter for want of water. There is a heavy fall of snow in the mountains, and the miners are in good spirits, as they know it has got to come some time, and they will get the good of it.

Highland Chief.—The Highland Chief, near the Sugar Pine mill, has been able to do but little recently for want of water to run their hoisting works.

Mountain Gate.—Work is progressing on the Mountain Gate mine at Damascus, and their prospects are improving.

Breece & Wheeler.—The gravel in the breasts is so rich that pieces of gold can be picked out with the fingers.

NEVADA.

WASHOE DISTRICT.

Belcher.—*Territorial Enterprise*, Feb. 3: The cable in the north incline having given out, work was suspended early in the week. It has been replaced by a new one and work resumed. Since then the north drift on the ore streak, on the 2760 level, has been advanced 17 ft, making its total length from the crosscut 47 ft. The face of this drift is still in very favorable-looking ground, with spots of ore through it. On the 3000 level work in the east and south drifts has been suspended for the purpose of cutting out and enlarging the station, as also to start a drift north to connect with the Crown Point. In addition to their own water the Belcher pump is taking the water of the Con. Imperial, the Yellow Jacket and the Overman.

Overman.—About 35 ft of the distance run this week has been through vein porphyry; the balance of the distance has been through quartz with seams of porphyry. Some of the quartz gives fair assays. At the Forman shaft work has been delayed somewhat by the extreme cold weather, ice having formed in the shaft to a depth of 500 ft.

Savage.—The incline has been sunk 14 ft; total distance on the slope, below the 2200 level, 185 ft. Bottom in hard rock, with but little water. They have placed new guides in north shaft for a distance of 512 ft. Drift from Combination shaft has been extended 67 ft; total length on drift, including station, 287 ft.

Bullion.—The incline winze has been sunk five ft, making the total depth on the slope 323 ft. They have completed a station on the 2350 level, and have started the north drift on this level. The formation at this point is vein porphyry with streaks of quartz.

Ophir.—On the 2500 level the main north drift has a total distance from the incline of 147 ft. It has passed through vein matter carrying quartz giving low assays. On the 2300 level the joint Mexican west crosscut has a total distance from the main drift of 344 ft, passing through soft vein porphyry. The north drift in the Hardy vein is in 32 ft, showing quartz in the face giving low assays. On the 2200 level the north drift in the Hardy vein is in 48 ft from the main drift. The south drift in the Hardy vein is in 48 ft from the main drift.

Union Con.—On the 2300 level the main south drift from the Union shaft has been connected with the joint Mexican winze down from the 2000 level. On the 2400 level the east drift from the ore stopes is now in 225 ft from the Union shaft, passing through vein matter carrying clay and quartz seams.

Sierra Nevada.—The north drift on the 2200 level has been advanced during the week 38 ft; total distance, 432 ft. The west crosscut on this level has been discontinued at a distance of 68 ft west of the main drift. At this point there was a heavy flow of water, and it became necessary to bulkhead the face of the crosscut. An east crosscut has been started 400 ft north of the shaft. On the 2300 level the north drift is in 230 ft. Crosscut No. 3, north on this level, has been stopped 48 ft west of the drift, having passed through some streaks of very good ore. Crosscut No. 2 is in 45 ft. This crosscut has passed through 11 ft of fair-milling ore. At 145 ft north of the incline they have commenced sinking a winze to the 2400 level.

Yellow Jacket.—The north drift is 50 ft past the north line. The north winze is 95 ft on the slope, but is retarded on account of a slight increase of water.

Mexican.—On the 2300 level the main north drift is 471 ft from the south line. The joint Ophir west crosscut on the southern boundary is in 344 ft from the main north drift. The connection between the joint Union Con. winze down from the 2000 level and the main south drift run by the Union Con. company from the Union shaft on the 2200 level has been made.

Gould & Curry.—The Gould & Curry and Best & Belcher joint shaft has been sunk and timbered 12 ft during the week; total depth, 896 ft.

Ward.—In consequence of a stratum of hard syenite rock encountered they have been enabled to sink and timber only 14 ft during the week; total depth, 2,004 ft. The shaft remains in this character of rock. Flow of water continues strong.

Hale & Norcross.—The south winze from the 2200 level is 127 ft deep. The bottom is in porphyry and quartz. The flow of water continues, and very hot. The north crosscut has a total length of 95 ft; face in hard porphyry.

BRISTOL DISTRICT.

Hillside.—Pioche *Record*, Jan. 24: Last Tuesday a large body of high-grade ore was encountered in the sinking of winze No. 1, from the west sixth level to the seventh. Its development will be looked forward to with a great deal of interest, for the winze is the deepest one from the sixth level, and the body of ore is the first tapped on that level south. The finest bar of silver bullion ever shipped from southeastern Nevada was run out of the Hillside refinery last Wednesday. It was 989 fine, and worth $1,897.10.

CONGO DISTRICT.

Mary Wilder.—Paradise *Reporter*, Jan. 24: This mine shipped about a ton of ore to Salt Lake, yesterday, for reduction. There is a considerable amount of apparently rich rock on the dump and in sight at the mine. Should the returns from this shipment justify it, other and larger shipments will be made soon.

PARADISE DISTRICT.

Paradise Mill.—Paradise *Reporter*, Jan. 24: The Paradise mill, which has been shut down since last Friday, in consequence of a broken shaft, was started up at noon Thursday, and has been running steadily ever since.

ARIZONA.

Stonewall Jackson.—Globe *Silver Belt*, Jan. 24: A specimen valued at $2,000 was shipped to San Francisco early in the week; since then a strike of surprising magnitude has been made, which, according to reports, beggars all others hitherto made, both in extent and general quality of the ore. The deep working in the Stonewall has settled the question in this section as regards the permanency of our mines.

Seminole.—One-half interest has been sold to John Winne, of Albany, N. Y.

Samenia.—Work has commenced on the main shaft. Good results are anticipated.

Happy Boy.—Prescott *Democrat*, Jan. 23: This mine is in Walker district, better known as Upper Lynx creek, eight miles southeast of Prescott. It is one mile distant from the Benjamin. The shaft is down 26 ft, and shows a body of two ft of very high-grade ore. Numerous assays have been made which range from $500 to $1,200. The ledge is in a talco slate formation.

Peck.—The wonderfully rich ore taken from this mine during the past four years has done more to attract the attention of the outside world to Arizona's matchless mines than any other discovery. The Peck has produced over half a million of the glittering treasure, and the work is nothing but surface scratching. The unfortunate litigation, which is part of the history of this property, has thus far prevented its proper development.

Item.—From Francis McMahon we learn, that on his recent prospecting tour he made the discovery of several valuable claims of silver and copper. Some of the ore which he exhibited assayed $500 in silver. The claims are situated about 20 miles southeast of Tiptop. Wm. Jennings has some very fine looking gold quartz, of which he says he discovered a ledge about one and a half miles west of the Davis mine. John Mars arrived in town from the Pinon ranch, and reports that they are steadily working on the Eureka copper mine, which is producing some good ore. An immense copper ledge has been discovered in the Agua Fria district, by McManus and Carpenter. The vein is more than six ft wide, and specimens of the ore are almost pure copper. George Clark, owner of the Continental mine, Turkey creek, has some fine specimens of silver ore from his claim. The Continental is one of the most valuable mines in the district, and Mr. Clark intends to thoroughly develop it.

Silver Chief.—Tucson *Record*, Jan. 24: One shaft of 125 ft shows metal going from $150 to $4,000, and a ledge 20 ft wide, with 13 ft of metal.

Independent.—Arizona *Miner*: This property is opening up very rich. They are working the ores by Mexican Baso process, and getting over $80 to the ton. The vein is six ft wide.

Model.—This is in Peeples Valley, two and a half miles from the stage road. Owing to the fact that the mine is located in the near vicinity to one of our finest agricultural districts, giving it the advantage of a near and easy market, is surrounded by timber, and in close proximity to water, having a fair vein of free milling ore, which assays over $100 per ton, it at once becomes a very desirable property.

Item.—West of the Santa Maria, in the Haqua-ha mountains, there is a mammoth copper deposit which will pay 90% by smelting process. From every direction we have the cheering news of rich copper discoveries.

Empire District.—Pima *Record*, Jan. 24: Mr. Harvey came in Thursday and brought some exceedingly rich ore from the Justice mine, assaying $2,190. This district is east of Davison's canyon, 45 miles southeast of Tucson, and comprises many good claims, among them the Total Wreck and Empire. On the Justice a tunnel of 63 ft and shaft of 38 ft has been run, showing a pay streak of solid metal, 14 inches in width. The Total Wreck has a tunnel 38 ft and drift 18 ft, and the Empire shaft 15 ft.

Washington Camp.—The mining outlook is better than ever. Good ore has been struck in the Ella No. 2 at a depth of 25 ft. A new opening north of the main shaft has been made on the Obio, exposing a body of rock, carbonate and galena, of marvelous extent and richness,

Continued on Page 92.

Disease-Germs.

An address delivered at the Anniversary Meeting of the San Francisco Medical Society, November, 1879, by J. H. Wythe, M. D., Professor of Histology and Microscopy in the Medical College of the Pacific.

In addressing this medical association, so largely representative of the scientific learning and culture of the most cosmopolitan city in the world, I am not vain enough to imagine that I can present any new theme, nor that I can better elaborate an old one than many of those who listen to me. I deem it an honor and a token of your confidence, to have been appointed your orator at this annual meeting, and can trust to your generosity to overlook whatever may seem immature or imperfect in my remarks.

In selecting a topic of general interest to the profession, rather than one which would tempt me to indulge in vague generalizations or eulogies respecting medical progress, I am following a custom of some of the leading scientific associations of Europe and America, and not unusual here—a custom both useful and appropriate.

The theme I propose is that of Disease-Germs, a subject so influential in etiology as to have quickened many fertile imaginations, from the days of Varro and Columella to the present, although it has also led to valuable practical results. If, in the light furnished by the recent advances of biology, I can dissever the romantic and imaginative from the true, so as to indicate the real importance of disease-germs among the *materies morbi*, I shall have accomplished much.

Every agency of nature outside of the bodily organism, and every activity of body and of mind within the living structure, is capable of becoming a cause of disease, as soon as it disturbs the normal current of life, so that the number of causes is practically unlimited. Of all the causes of disease, the most difficult to isolate and investigate are those which produce what are known as miasmatic and contagious, or infectious, diseases—diseases which may be diffused through the air or water, and those which spread from one person to another.

Formerly infectious diseases were regarded as products of gaseous chemical action—so-called fermentation—or zymotic diseases; but more recently they have been considered to be each the result of a virus, in all probability specific; or a special poisonous substance has been imagined for each disease. The discoveries of the last few years have tended still further to isolate the causes of this class of diseases, and the theory of *contagium vivum* has found very general acceptance. In other words, the belief is now very general that the causes of contagious affections, and perhaps also of miasmatic diseases, are living, or organic, causes, so that these derangements are not merely the physical or chemical result of the action of inorganic matter. From this view it is but a step to the germ theory of disease.

Under the general title of disease-germ, two distinct theories claim consideration: 1. The theory of vegetable parasites in the blood, generally fungi, and of this class most commonly the various species of *Bacteria*. This has been very elaborately worked out by the German pathologists, and has been favorably regarded in other countries since the publication of the observations of Pasteur, Salishury and others. 2. The germ theory of Dr. Lionel S. Beale, who considers that "the particles concerned in the propagation of contagious diseases are allied in constitution to the living matter, or bioplasm, of the organism," and "derived by uninterrupted descent from the bioplasm, or living matter, of an organism, which at an antecedent period may have been perfectly healthy."

The definition of a germ given by Dr. Beale is identical with what modern biology terms a cell, or the elementary unit of living beings. It is simply a piece of bioplasm, "a particle of living matter, which has been detached from already existing living matter." "The living particle which sprouts from a cell of the adult plant or organism, and is then detached, may be called a germ, as well as the living particle formed in the ovum, or the living matter in the ovary, from which the new being is evolved." It is evident that this meaning to which the term "germ" is restricted is a special meaning, and, so far as it implies reproduction, is limited to the multiplication of similar cells, and not of individuals, as in the case of the ovum. The various masses of bioplasm into which the ovum of man or of the higher animals subdivides, are exact counterparts of each other, so far as external appearance and chemical composition are concerned, but they differ greatly in power. Some produce glands; some, muscle; others, nerve, bone, vessels, etc. The powers of these bioplasts, once lost, can never be regained, although they may continue to live and be nourished, and multiply even more actively than before. Indeed, observation shows that degradation in power is generally associated with increased rate of growth and remarkable vitality, as in the rapid growth of embryonic cells in new formations, etc.

"Abnormal cells cannot be regarded as parasites upon healthy cells, although many forms of abnormal bioplasm, like pus, cancer, etc., may be transferred from animals to man, or vice versa, and grow and multiply."

"If such bodies as mucous corpuscles, pus corpuscles, cancer cells, tubercle corpuscles and disease germs generally, be termed parasites, the nails, or hairs, or glands, or limbs might with equal propriety be regarded as of this nature."

The following *resume* of Dr. Beale's theory is from his work entitled, "Disease-Germs; Their Nature and Origin," a work which will well repay careful perusal. The most recent biological researches have almost uniformly tended to confirm the statements made in it.

"The minute contagious bioplast is less than the 100,000th of an inch in diameter, and often so very clear and structureless as to be scarcely distinguishable from the fluid in which it is suspended. Such a minute particle may readily be transferred from the affected organism to an apparently sound organism. It may be carried a considerable distance from its source without losing its marvelous power of causing in the organism invaded a series of changes resembling, and often in very minute particulars, the phenomena which have occurred in the organism from which it was derived.

"And it is established that there exist different kinds of contagious living bioplasm, each capable of occasioning specific phenomena which distinguish it. The poison of small-pox will produce small-pox, not typhus fever, or measles, etc., nor will any of these produce small-pox. Without, therefore, pretending to identify the actual particles of the living bioplasm of every contagious disease, or to be able to distinguish it positively from other forms of bioplasm, healthy and morbid, present in the fluids, on the different free surfaces, and in the tissues, in such vast numbers. I think the facts and arguments I have advanced prove: first, that the contagious virus is living and growing matter; secondly, that the particles are not directly descended from any form of germinal matter or bioplasm of the organism of the infected animal, but they have resulted from the multiplication of particles introduced from without; thirdly, that it is capable of growing and multiplying in the blood; fourthly, that the particles are so minute that they readily pass through the walls of the capillaries, and multiply freely in the intestines, between the tissue elements, or epithelial cells; and lastly, that these particles are capable of living under many different conditions—that they live and grow at the expense of various tissue elements, and retain their vitality, although the germinal matter of the normal textures, after growing and multiplying to a great extent, has ceased to exist."

These views Dr. Beale elaborates with great force and plausibility. He admits that myriads of vegetable organisms, microscopic fungi and algæ of different kinds, and their germs, may enter the human body, and are actually seen in the fluids and tissues of the higher animals during life, but he claims that all attempts to demonstrate constant species of bacteria, representing different contagious diseases, have completely failed; that the beneficial action of Mr. Lister's antiseptic treatment of wounds is traceable to the influence of carbolic acid upon the growth of bioplasm, and that the virulence of the poison in cases of dissection-wounds is greatest before putrefaction and the development of bacteria—the real virus losing its power soon after bacteria appear. He states that those diseases which are known to depend upon the growth and development of vegetable organisms are local affections, not involving the blood, and that very few morbid conditions depend upon fungi, whose germs multiply in textures already deteriorated, rather than in tissues previously healthy.

On the other hand, recent biology has shown that the animal and vegetable bioplasm have similar endowments as to nutrition, growth and reproduction. In the vegetable, or fungus cell, the bioplasm is imprisoned in a cell-wall of cellulose, while in the animal it may be either free or encased in formed material of different kinds. As to the fungi, it has been quite satisfactorily shown that they are the exciting and essential cause of both fermentation and putrefaction. They form a very extensive class of primitive organisms, which have so many peculiarities that some have been led to regard them as different from both animals and vegetables. They look like vegetables, but feed as animals. They have no chlorophyll, as the green vegetables have, and which enables them to break up carbonic acid. Light is not essential to their activity, as it is to that of green vegetables, and they are incapable of assimilating inorganic food, but require organic substances for their support. The bioplasm of some kinds of fungi has amœboid movements, like other primitive forms of life, yet their principal office seems to be to break down and restore effete organic material to the inorganic world. The excessively minute and almost vapor-like sporules of fungi float about in the atmosphere in countless numbers, only waiting for a fitting soil in which to grow. As long as there is no refuse matter to be removed these scavengers are unemployed, but the smallest quantity of decaying animal or vegetable matter left exposed, becomes covered with spores, which develop with astonishing rapidity. A scanty number of spores, only to be detected by careful research, will in a few days, and sometimes in a single night, give birth to myriads, to repress or remove the nuisances referred to. When the offal diminishes, fewer of the spores find soil on which to germinate, and when all is consumed the active legions return to their latent or undeveloped state. Like Milton's spirits

> "So thick the aery crowd
> Swarmed and were straitened, till the signal given,
> Behold a wonder; they but now who seemed
> In bigness to surpass earth's giant sons,
> Now less than smallest dwarfs."

Many of the most simple forms of fungi have been shown by recent investigations to be imperfectly developed states of other species. The *Torula cerevisiæ*, or yeast plant, whose growth is the cause of fermentation in solutions of sugar, and various forms of *Bacteria* which cause putrefaction in animal substances, appear to be but varieties, or stages in the development of some of the molds. On account of this polymorphism, or assumption of different forms, in the life history of these organisms, their study is very difficult. Those genera and species which are of most interest in pathology and etiology, may be however provisionally classified as follows, after Wagner: *(Manual of Gen. Path.)*

I. Dust, or Germ-Fungi *(Coniomycetes)*. These consist of single, or loosely connected spores, which sometimes develop a mycelium, or filament, from which other spores are formed by constriction.

Here belong the "rust" of grain *(Uredo)*, and the yeast-fungi (*Torula*).

II. Filamentous Fungi (*Hyphomycetes*). In these the mycelium consists of lengthened tubes, often branching in elegant figures, and bearing spores.

The "molds" belonging to this order, as the *Penicillium*, or common fruit mold; *Aspergillus*, club-mold; and *Mucor*, with bladder-like fruit on the mycelium. Here also are placed the fungi found in various diseased states, as that of the muscardine in silk-worms (*Botrytis bassiana*), the potato-disease (*Fasisporium solani*), the grape-disease (*Oidium Tuckeri*), and the fungi of diseases of the skin and mucous membranes, as the *Tricophyton tonsurans*, found in ringworm, mentagra, etc. *Achorion Schonleinii*, or favus-fungus, *Microsporon Audonii*, *Microsporon furfur* and *Oidium albicans*, or thrush-fungus.

III. Cleft-fungi (*Schizomycetes*). Here are placed the various forms of bacteria:

1st group, Globular bacteria.

1st genus, *Micrococcus*. These are globules or oval cells, sometimes united into bead-like filaments, or rounded masses. They are sometimes seen in ammoniacal urine, and are regarded by many as "ferments of contagion," and the cause of diphtheria, pyemia, etc.

2nd group, Rod-like bacteria.

2nd genus, *Bacterium*.

They are of short cylindric form, and have spontaneous motion. *B. termo* is the ferment or cause of putrefaction.

3d group, Filamentous bacteria. Elongated cylinders, increasing by transverse division.

3. Genus, *Bacillus:* Straight filaments. *B. anthracis* is found in gangrene of the spleen.

4. Genus, *Vibrio*. Wavy filaments, seen generally in putrifying solutions.

4th group, Screw-bacteria.

5. Genus, *Spirochæta*. *S. plicatilis* is found in tartar from the teeth.

6. Genus, *Spirillum*. Spiral shorter than the last. In this group also may be placed the *Leptothrix buccalis;* long, slender filaments from the mouth, etc.

The principal argument in favor of considering fungi as the disease-germs of contagious and miasmatic disorders, are thus given by Prof. Liebermeister in Ziemssen's Cyclopedia. "In this connection there are facts of considerable importance, which have been furnished by recent investigations into the nature of many contagious diseases in animals and plants. The contagious diseases of the silk-worm, which have been a source of so much danger to the silk-worm culture, have been proved to be parasitic, and the history of the parasite has been followed thoroughly. In flies and many other insects, we have known similar epidemics of a parasitic nature to have taken place.

"The epidemic and contagious diseases of the higher classes of cultivated plants, such as the potato disease, the grapevine disease, the ergot of grain, and others, all are derived from fungus-growth. The question, too, on which for a long time opinions were divided, as to whether the fungus were the cause, or only the consequence of the disease, has been answered by the botanists with unanimity. Where the development of the fungus had been thoroughly examined, they reported that it was the sole and sufficient cause of the disease. It is clearly evident, too, that the further the progress of investigation advances in human pathology, and the more frequently low organisms are shown in diseases, the more prominently will this question urge an answer."

Prof. Wagner, of Leipzig (*Gen. Pathology*, p. 108), while acknowledging his belief that many important affections are caused by fungi, confesses that the subject is yet involved in much obscurity and doubt. He says: "No two observers have, concerning the same disease, reached the same results; the specific fungus of one is disavowed by another, etc. But in spite of all that, much is yet to be expected from the further cultivation of this field, with respect to the etiology, etc., of many diseases."

The fact that "filtration of putrid fluid through porous porcelain under pressure deprives it simultaneously of its offensive smell, poisonous action, and power of generating bacteria," proves that the infectious quality does not reside in the fluid, but in what is contained in the fluid—*Essay on Disease-Germs, by B. A. Watson, M. D.* Now in the fluid of the small-pox vesicle, in the blood and secretions of animals suffering from the cattle-plague, and in the products of other contagious diseases, Dr. Beale has found multitudes of rapidly growing bioplasts, and his statements have been fully confirmed by subsequent research. Dr. Salisbury and others find bacteria and other fungi in malarial and contagious affections. Each considers he has found the true *contagium vivum*. But may not both be true? The fungi, as well as all living things, spring from bioplasm, and may have their share in producing disease as well as the degraded bioplasm of the human tissues. The latter must be a frequent cause of disease. There can be no doubt respecting the propagation of purulent opthalmia or gonorrhea by the germs, or leucocytes, which are transferred from one mucous membrane to another. "A single epithelial cell may carry multitudes of active particles of syphilitic poison, one of which introduced into the blood or lymph of a healthy person would probably grow and multiply, and give rise to pathological changes characteristic of, and quite peculiar to this particular poison." When we remember that these particles are excessively small, although alive; that they may continue to grow outside of the parent organism, and acquire by the abnormal conditions of their growth new and virulent properties; that when dried, and in a state of dormant vitality, they are sufficiently light to be carried by air currents to great distances; and that on contact with warmth and moisture, and especially with secretions similar to those whence they originate, they will at once begin to germinate and multiply; all the reasonable conditions of *contagium vivum* are fully met. On the other hand, the known properties possessed by fungi, of exciting fermentation and putrefaction, forbid us to suppose that their presence in considerable numbers in animal fluids is of no moment. Secondary infections, if not primary contagions, must be regarded as the probable result of the presence of these organisms.

The question of the spontaneous generation of germs is largely disposed of by either of the theories referred to. Besides, the careful experiments of Pasteur have fully shown that air filtered from its germs by cotton-wool may be admitted to fluids in which all germs have been destroyed, and no living organisms will appear in them. The experiments of Prof. Tyndall with air made so pure that a brilliant ray of light shows no suspended germs in it, and in which no infusorial organisms occur, although abundant in common air, establish the same theory. Messrs. Dallinger and Drysdale have also shown that some germs will resist a heat of 300° F., which accounts for infusoria in some boiled infusions. So that we may regard it as a settled axiom of modern science that every living being originates from a previously living being.

On either the bioplasmic or the fungoid theory of disease-germs, the practical utility of Lister's antiseptic treatment in surgical operations finds a rational explanation. The recent accounts published by Dr. Keith, of Edinburgh, of the application of this treatment to ovariotomy, prove how great an improvement has been made in this direction. Increased skill, and special care in operating, have doubtless much to do with the result, yet the fact remains that graver cases may be successfully treated with the use of carbolic acid spray and carbolized dressings, than a prudent surgeon would have undertaken at all otherwise.

Dr. Beale's bioplasmic theory illustrates the good effects of the sulphites, and especially of the sodium sulpho-carbolate in zymotic diseases. I have used the latter in 20 gr. doses three times a day in some cases of cancer, and have thought it had some influence in arresting the growth of embryonic abnormal bioplasm. In some cases of diphtheria and scarlatina maligna it was of undoubted benefit. It deserves a more extended and careful trial.

I need not do more than remind you, in closing this brief review of the subject, of the importance of obtaining accurate information respecting it, by careful observation; to stamp out pyemia, hospital gangrene, erysipelas, and similar affections by antiseptic treatment, and to so learn the course of production and propagation of disease-germs as to be able to adopt a course of public hygiene which shall neutralize the risk of communities being decimated by pestilent scourges, like cholera, or typhoid and malarial fevers. Such are the results which may be expected by the attainment of positive truth upon this subject. So desirable a consummation is worth years of pains-taking study and experimentation, and the physician who succeeds in this direction will have earned the gratitude of succeeding ages.

Cost of Mining in Utah.—The following are the rates of mining cost by day or contract. For working the mines dead work, pumping, handling ores, etc., it is in different districts about as follows:

District.	Mines.	Price per ton.
Park	Ontario	$6.50
Big Cottonwood	Flagstaff	9.00
Bingham	Old Telegraph	4.00 to 5.
Silver Reef	Stormont, Leeds	6.00 to 7.
Frisco	Horn Silver	8.00

Generally it ranges from $4 to $10 per ton. Miners' wages run from $2.50 to $3.50. A small number of Mormons work in the mines. The Church discourages it. Laborers, on the surface, at mills, furnaces, etc., receive from $1.50 to $1.75. In the Silver Reef or metalliferous sandstone region wages range 25% higher than elsewhere. Wood costs from $4 to $6 per cord. Coal along the Union Pacific and Utah Southern will cost from $7 to $8 per ton; elsewhere it ranges as high as $12 to $15 per ton. These are the figures in the mining camps.—*Silver Reef Miner.*

The number of Scotch furnaces in blast at the close of December was 100, or eight more than at the corresponding period last year. Each furnace produces about 195 tons per week.

Relocating and Jumping.

What Constitutes $100 Worth of Labor and Improvements?

Some twenty odd mining claims have been either jumped or relocated within ten days past. Several claims held by a person not a citizen were relocated, and a number have been jumped or relocated, on the ground that sufficient work had not been done to comply with the law in such case made and provided. There seems to be a difference of opinion as to what constitutes the $100 expenditure required by the United States laws. Some persons in the district have annually expended $80 for labor, and added $20 for cost of powder, fuse, tools, etc., making the total $100, and upon application to the Recorder received a certificate that the lawful amount of labor had been performed. The parties who have relocated a number of such claims hold that $100 worth of actual labor must be performed each year, and that the law has not been complied with. The point is one which may cause much litigation, if it is not better defined by law or settled by decision. The literal reading of the statute is as follows: "On each claim located after the tenth day of May, eighteen hundred and seventy-two, and until a patent has been issued therefor, not less than one hundred dollars' worth of labor shall be performed or improvements made during each year." The record of the affidavit of the claimant "that at least $100 worth of labor or improvements" have been performed or made is *prima facie* evidence of the performance of such labor, but so far as we know the question as to whether the money expended for powder, tools, etc., can be counted as part of the $100 worth of "labor or improvements" has never been decided by the Commissioner of the General Land Office. But the statute says "the miners of each mining district may make regulations not in conflict with the laws of the United States, or with the laws of the State or Territory in which the district is situated, governing the location, manner of recording, and amount of work necessary to hold possession of a mining claim," and it is held by some persons that the last clause of the quotation gives the miners the right by local laws or custom, to say what shall constitute $100 worth of "labor or improvements;" for instance, that sinking a shaft or running a tunnel a specified number of feet should be worth $100. The custom in this district has been to count the cost of materials used in making permanent improvements on claims, such as sinking shaft or driving tunnel or drift, and claimants believe this will hold good in the courts. However, until the law is made more definite, or the matter settled by decision, perhaps, it would be well for parties holding valuable claims to perform fully $100 worth of labor, without regard to the cost of the necessary tools and materials. Expensive litigation, with possible loss of good bonanzas, may thus be avoided.—*Esmeralda Herald.*

Petroleum Product of 1879.

From *Stowell's Petroleum Reporter* we gather the following facts, which show the enormous proportions which this branch of industry has attained. It is not in the great amount of crude oil that is produced and the wealth which it adds to our nation alone, that its advantages are manifested; but they are still further evinced in the great field of labor which they have created and are keeping in activity, giving work directly and indirectly to hundreds of thousands of workers. We give the annexed quotation from the *Reporter* as a concise summary of the production of 1879:

The petroleum business during the year just closed has been marked by many results never before attained. The enormous production of crude (nearly 20,000,000 barrels) exceeded the production of any previous year by about 5,000,000 barrels. The average price of crude at the wells for the year was 94⅜ cents per barrel, being 39§ less than for the year 1874, which has been considered heretofore the cheap oil year. The number of wells drilled during the year was 3,038, which number was not greatly in excess of former years, only about 6¾% of the wells completed proved to be dry or worthless against 11½% of dry holes developed in 1878. The shipments out of the producing regions have been larger than in any previous year, amounting to nearly 16,000,000 barrels, which exceeded the shipments of 1878 nearly two and a quarter million barrels.

We regret to learn that there is a steady decline in the production in oil fields of Pennsylvania, on which point the *Reporter* states:

The maximum production of crude petroleum in the Pennsylvania oil fields was reached in August, 1879, since that time the production has undoubtedly been steadily on the decline and from present indications we may look for a continued decline, slowly but surely, until some new and now unknown field shall be found which shall yield the precious fluid bountifully.

The actual number of barrels—equivalent to 42 gallons each—that were produced in 1879 was 16,261,825, making a daily average of 53,523. The total number of barrels, equal to 40 gallons each, exported from the United States in 1879 was 10,441,213; equal to 28,606 barrels each day.

The average prices per gallon in barrels during the year were for crude, 7.10 cents; for refined, 8.08 cents; and for naptha, 6.54 cents.

Useful Information.

Paper Hanging.

Paper-hanging is quite a modern invention, after all; that is, in its Western use. In the East wall-papers had been known from time immemorial; but it was only toward the end of the seventeenth century that they were brought from China, imported into England and Holland along with a multitude of other indiennes and chinoiseries. France took hold of the idea and perfected it, and has hitherto produced the best, while Germany and Belgium have given the cheapest papers; but England has lately come to rival France. There is now a vast variety to choose from everywhere; mounting from the rough kitchen fourpenny paper that, put on wrong side out, when its pattern is but slightly stamped, presents a uniform gray surface like something a great deal more expensive, and where the pattern is heavily stamped, presents a damascened gray surface, to those elaborate in art and material, whose use in a single room requires an expenditure of a small fortune.

There are the common satin-faced ones, the gilded, silvered and bronzed grounds, embossed gilt and mica, imitation of silks and tapestries, cretonnes and chintzes, raised and stamped velvets; there are some like delicate muslins embroidered in chain stitch and lined with color, at six dollars a roll and upwards; others like the dark, old, embossed Spanish leathers buttoned to the wall, from nine to twelve dollars a roll, according to present prices; there are the thick, Japanese papers, where the black ground riots in fantastic assemblage of all rich colors, where a gold ground carries birds and butterflies and fans in charming profusion, and those of lighter, less marked and less agreeable characteristics, at about the same price as the leather papers; others yet more expensive, thick and heavy, a finely-glazed porcelain-like representation of tiles of all sorts, for those who will have them in imitation; and in addition there are the frescoed papers, and those for ceilings, for dados and for friezes. It would be hard if out of such a variety one could not get up rooms that would be satisfying to the most demanding sense of the beautiful.

Cork and its Value.

The constantly increasing demand for cork for bottling and other purposes, together with the fact that the cultivation of the tree is sadly neglected, threatens to cause a serious dearth of the article. Yet no other substance has been discovered that will serve as a substitute for cork in many of the uses to which it is applied. Cork is worth 11 times what it was a century ago, and its market value is continually increasing. The American Commissioner of Agriculture has satisfied himself that the cork tree can be successfully cultivated in various parts of the United States, and in his report for 1878, just issued, recommends that the Government offer premiums to those who, within a reasonable specified time, shall have obtained the best results in cork culture. In Sicily, Sardinia and the kingdom of Italy, great plantations of cork trees have been destroyed to obtain the tannin from the bark. After having been stripped of their bark, the trees were burned, in order that the carbonate of soda might be extracted from their ashes. In 1822 the French government began to nurture this important interest, and France now has about 500,000 acres of cork plantations in Algeria. The tree grows as high as 65 feet, with a diameter of from 3 to 5 feet, and will live and yield cork from 150 to 200 years. In a dry, sandy, siliceous soil, at an altitude of from 1,600 to 3,200 feet, and not further north than the 45° of latitude, cork plantations will flourish. The tree does not, however, yield valuable cork until it is towards 15 years old.

To Dye Straw.

Magenta Red.—The first operation for dyeing this or any other color on straw is to steep the latter in a bath acidulated with sulphuric acid for 12 hours. For magenta, take an acid bath of 4° to 5° Be. The straw after washing is immersed for 12 hours in a bath kept at 30° to 40° C., containing the necessary amount of dye. Now wash well and dry. Other aniline colors do not dye straw with the same facility.

Maroon, with Logwood.—Clean the straw by boiling with a solution of carbonate of soda, then steep in a bath of logwood for two hours. To give a bluish tint, add some bluestone to the bath; if too much of the latter is used the straw will have a greenish hue. This is a loose color, only employed on account of its cheapness.

Coffee and Chocolate Stains.—If the coffee or chocolate contains milk, the stains produced are more pronounced than if prepared with water only, but they are also more easily removed. To remove them, the stains are washed with a mixture of yolk of egg in tepid water. If with this treatment they still remain, add a little spirit to the mixture, and rub with a hard brush.

Blue Linings for Hats.—In producing these the cloth is not dyed, but the thickened color is applied to it in the following manner: Prepare the color with 22 gallons of water, 30 pounds starch, 2 pounds tallow, 44 pounds ultra-marine blue; mix, boil, pass through sieve; print on the roller first on one side, then on the other, and dry on the cylinder.

Skeleton Leaves.—The following method has been communicated to the Botanical Society of Edinburg, by Dr. G. Dickson: A solution of caustic soda is made by dissolving three ounces of washing soda in two pints of boiling water, and adding one and a half ounces of quick-lime previously slacked; boil for ten minutes, decant the pure solution and bring it to the boil. During ebullition, add the leaves, boil briskly for some time, say an hour, occasionally adding hot water to supply the place of that lost by evaporation. Take out a leaf, put it into a vessel of water, and rub it between the fingers under the water. If the epidermis and parenchyma separate easily, the rest of the leaves may be removed from the solution and treated in the same way; but if not, then the boiling must be continued for some time longer. To bleach the skeletons, mix about a drachm of chlorido of lime with a pint of water, adding a sufficient acetic acid to liberate the chlorine. Steep the leaves in this until they are whitened (about ten minutes), taking care not to let them stay in too long; otherwise they are apt to become brittle. Put them into clean water, and float them out on pieces of paper. Lastly, remove them from the paper before they are quite dry, and place them in a hook or botanical press.

To Remove Nitrate of Silver Stains.—Dr. Kraetzer, of Leipsic, proposes, as a substitute for potassium cyanide in the removal of stains made by lunar caustic or silver nitrate, the following mixture: 10 grammes ammoninm chloride, 10 grammes corrosive sublimate, dissolved in 100 grammes of distilled water, and preserved in a glass-stoppered bottle. He says that with this solution the black stains may be removed from linen, woolen and cotton goods perfectly, without injury to the goods. It will also remove stains on the skin, but, although less poisonous than the cyanide, it must not be forgotten that it is a corrosive poison. For the skin we prefer to apply tincture of iodine, or a solution of iodine in iodide of potassium, followed by strong aqua ammonia; if slower, it is safer both to use and to keep in the house.

A New Boot Sole.—A Chicago boot manufacturer, Mr. Goodrich, has introduced what he is pleased to call an indestructible sole, in which nickel-plated steel rivets are embedded in the leather. These rivets are forced through perforations from the inside of the sole to its outer surface, and being less in length than the thickness of the leather, the head is securely embedded, and does not drop out as the sole becomes worn. Owing to the nickel-plating, it is claimed there is an entire absence of rust.

To Keep Belts Soft.—To keep belts soft and pliable, but little care is generally needed, but a little attention on this point would be well worth the while of many mill-owners. When a belt is dry and husky, but still pliable, a little blood-warm tallow, dried in by the fire or the heat of the sun, is all that is needed. When hard and dry, apply neat's-foot oil mixed with a small quantity of resin.

Iron Protected by Gum.—Sheet iron covered with gum of the euphorbiaceæ, common and luxuriant in tropical climates, was immersed in Chatham, England, dockyard, where everything rapidly becomes foul, and when taken out was found quite clean. The gum is intensely bitter and poisonous; hence marine animals avoid it.

A new kind of crockery, designed to fill the place of earthenware to some extent, has recently been introduced. It consists of cotton pulp, or felt, glazed with a composition into which dissolved glass largely enters. It is a durable, elastic material, possessing neither the great weight nor brittleness of earthenware; but it has yet to undergo the test of general use.

Good Health.

Bee Stings.

Nearly twenty years ago I lived in western Ohio. Our family consisted of my wife and myself, a little girl about three years old, and a little boy, a babe. One day my wife started on a visit on horseback, intending to return in the evening. I helped her on the horse, and went probably about thirty rods distance with her to let down the fence for her to pass through. During the time we left the children in the house, thinking they would not be likely to receive harm till I came back; but, to my great surprise, on returning to the house I found that the little girl had made her way to the bee-hives, and, I suppose, had thrust out one of her arms into a hive, as it stood up some distance from the ground, and in this way had stirred up the bees. When I took her into the house she was suffering extremely from the great number of stings which she had received. I took her upon my knee, and counted the number of stingers as I pulled them out from her face, arms and neck—I found 33—and afterwards discovered that there were as many more in her hair. Of course this looked to me like a very serious injury—enough to cause her death, if I could not adopt some mode of treatment that would be very effective. I had not been in the habit of using medicine in my family in a long time, but depended entirely upon water. After pulling out the stingers, I stripped the child, filled a tub half full of water, right cold from the well, and placed her in it for about a minute; then took her out and wrapped her in a sheet, and put her in the cradle. I repeated this process, bathing her about three times, ten minutes apart, and had the satisfaction of seeing it alleviate her suffering. After I had bathed her three times and wrapped her up warmly in the sheet, she dropped to sleep and did not wake up for about 20 minutes. Then the fever and pain woke her up, and I bathed her again. After two more baths she slept soundly, and on waking seemed to be nearly recovered. By the time her mother came home that evening, she was able to be around, with scarcely any marks of the stings upon her person. I do not believe that any other than water treatment would have brought about such a good result in so short a time. —*Ex.*

A Remedy Making Spectacles Unnecessary.—Dr. W. Cheatham writes to the Louisville *Medical News*, that he has found that the use of the sulphate of eserin makes it unnecessary to use spectacles in case their use is called for by a flattening of the cornea from old age—a very common ailment, called presbyopia. He states that this drug possesses the property of acting especially on the ciliary muscle, and contracting it, which contraction increases the convexity of the cornea. He recommends dissolving one gram of the sulphate of eserin in one ounce of water, and putting one drop in each eye at bed-time. It produces at first the opposite defect—a too great convexity of the cornea, which is called myopia, or near-sightedness, which, however, soon passes away. He thinks the use of this remedy perfectly safe, and also adapted to cases of glaucoma and other inflammations of the eye, in cases of weakness resulting from overwork, general debility, diphtheria, etc. He says that notwithstanding the use of spectacles in case of presbyopia gives comfort to the eyesight, there is also, however, always some trouble connected with them, which patients are often anxious to dispense with, and thinks they should be humored in this respect. We are of this opinion also, but advise caution in using this new remedy, because, as the effects are only temporary, a continuous use is of course intended, and experience has not yet shown what secondary effects may result from often repeated applications.

Benefits of Exercise.—In addition to the physical benefits derived from athletic exercise, it has a moral value; it affords a diversion and a vent to those animal energies which otherwise are sure to explode in debauch and all kinds of vicious excesses. The sympathetic thrill by which the mind accompanies a daring gymnastic feat, and the enthusiasm of athletic contests form the most salutary and, perhaps, the only normal gratification of that love of excitement which is either the legitimate manifestation of a healthy instinct, or else a wholly irremediable disease of our nature. The soul needs emotion as the body needs exercise—a fact we do not, as a people, realize. In times of scarcity the paupers of China and Siam silence the clamors of their hungry children by dosing them with opium; and for analogous reasons millions of our fellow citizens seek relief in alcohol.

Warm Clothing.—If you are apt to feel chilly dress warmly at home. A wadded coat will enable the chilly man to sit and work anywhere in doors, and so will an extra suit of thin flannel worn during the whole of the active day. Just let anyone who doubts what we say try the very simple expedient, when the chillness becomes unbearable, of putting on his dressing-gown over his ordinary clothing, and in five minutes he will be perfectly comfortable and ready for work, while he will not suffer as he fancies he will, when he goes out of doors. The popular notion upon that subject is a mere delusion. You are not strengthened for outdoor work by shivering indoors, but rather weakened; habitual warmth, if not too great, being one of the best preservatives of constitutional strength. Always try to remain moderately and healthfully warm.

Benzoate of Soda for Diphtheria.—Prof. Klebs, of Prague, announces that the benzoate of soda is the best antiseptic in all infectious diseases. It acts, as the experiments of the author show, very powerfully. It is claimed that a daily dose of from 30 to 50 grammes to a full-grown man will render the poison of diphtheria inoperative. The benzoate is prepared by dissolving crystallized benzoic acid in water, neutralizing at a slight heat with a solution of caustic soda, drying, and then allowing the solution to crystallize over sulphuric acid under a bell glass. Large doses do not appear to be absolutely necessary. Good results may be obtained by the daily administration of about 12 grammes.

Lime for Diphtheria.—A child in Auburn, ill of diphtheria, and whose life was despaired of, was cured by slacking lime. Small lumps of lime were kept constantly slacking near its mouth for a day and a half, until over a barrel of lime was thus slacked. The child was thought to be dying before this remedy was employed. It breathed the fumes constantly until cured.

Nutriment in Beans.—One pound of beans will support life in action as long as four pounds of rice. Two pounds of beans will help do more muscular work than three pounds of wheat, and more brain work than three and one-half pounds. The reason why beans require stronger powers of digestion than wheat is that they contain casein instead of glutin.

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Read & Rafferty, Notaries Public, S. F.
Kendall's Spavin Cure, Crane & Brigham, Agents, S. F.
Laura De F. Gordon, Attorney-at-Law, S. F.
Stock Dividend—Solid Silver G. & S. M. Co.
Assessment Notice—Cataract and Wide West Grav M Co.
Postponement Notice—Butte Hydraulic M. Co.

The Week.

The weather is becoming mors mild and spring-like, and with this favorahle cbange an advanced activity is noticed in business matters. Our wholesale dealers are receiving liheral orders from their country customers, and a hetter feeling exists in regard to trade. The prospects are very fair for abundant harvests, and the farmers are cheerful in their anticipations of the income from the growing crops, which, if the present ratee eball continue, will he fully realized.

Our legislators are working to good purpose, enacting required statutes, and mooting some doubtful points in the new Constitution.

At the hydraulic mines the severe weather for eome weeke has prevented the usual winter operations in them, and its retarding influence is etill severely felt in the high elevatious where they are located. In connection with this we append the following from the Dutch Flat *Forum*, which will he appreciated hy miners: "The injunction issued against the hydraulic miners some time ago hy Justice Jack Frost was thought to have been overruled, and the miners congratulated themselves that they would again proceed to work, hut the indications the fore part of the week cooled this idea. That old gentleman is abovs corruption and cannot he hought, but if he would condescend to melt a little toward us we would be truly grateful."

Steam Heating.—The idea of heating buildings over a large area hy steam from some central source seems to he gaiuing favor. There is prohably more in it than the public in general are aware of. The experiment of steam heating has been tried in Detroit, and pronounced a success, since which time several cities have granted privileges for the improvement, among them Cincinnati. A select committee of the Board of Aldermen of that city, appointed to investigate the subject, conoluded their work by agreeing unanimously to report the hill authorizing the laying of pipes under the streets, which the Board of Councilmen have already passed. The Committee made inquiries about the working of the system in Detroit, and all ths information they recsived was favorahle to it.

The Peculiar Gold Deposits of California.

Modes of Working Them.

As is well known, ths auriferous deposits of California occur in divers forms and under a great variety of circumstances, necessitating ths employment of many different methods and appliances for their successful exploitation. At first our miners busied themselves mainly with ths rivsr bars, shallow flats and gulches, or such other kind of placsrs as could be reached and worked most readily. As these becams occupied and impoverished, operations were gradually extended; first to the quartz veins, the hydraulic banks and the pliocene cbannels, and finally to the river beds, the deep-lying basins, the seam and the sulphurst diggings, the rewashing of the tailings and the crushing of the auriferous slates and cemsnts, the gold bluffs and bsaches and othsr strange manner of deposits having meantims received due attention.

Being so novel in form and requiring to bs utilized by devices equally novel and untried, it was a long time bsfore this class of our mineral rssources could be worked to advantage, a point that with some of them has not yet been reached. In most instances, however, ws havs succseded in handling thsm with so much profit as has eerved to draw the attention of the mining public etrongly towards them and enlist capital pretty freely in their further development.

Such being the case, something may vsry properly be said of the situation, extent and value of these deposits and the attempts that are being made to tnrn them to useful account.

As the Deep-lying Basins

Above mentioned are just now receiving considerable attention, we will first notice soms of ths efforts that are being made and the schemes projected for openiug them up and emptying them of their contents. A number of these gold-holding receptacles occnr throughout the mining districts of California, nearly all of which have been explored eufficiently to demonstrats that they would pay well if means could be found to work them effectually. Having satisfied themselves, through euch prospecting as could be easily done, that these depressions were rich in gold, the early miners made many efforts to work them through shafts, all of which proved nnavailing, more water coming in than they were able to handle. And hence it happened that many years passed before the plan of working them through tunnels or supplying adequate machinery for lifting out the water was generally adopted, hoth of these methods, according to circumstances, having lately come into use. At present several of these hasins are in course of exploration, while plans have been perfected for ths opening up of others. At a central point in the Butte basin, Amador county, a large pump and working shaft is heing sunk, and although a great deal of watsr is heing encountered, it is expected that the bottom will he reached and the works kept free of water through the aid of the powerful steam pumps employed for the purpose. In Siskiyou county a similar enterprise has been projected, but has not yet taken definite ehape. A third, however, having its site in Trinity county, and

Designed to Drain the Extensive Depression Known as Weaver Basin,

Has not only taken shape hut has made snch progrese as promises to insure the early commencement of active operations, valuable water rights and large tracts of rich gravel land having heen secured and all the surveys, maps and other preliminary work having heen completed. As this ie one of the most extensive operations of the kind ever undertaken in California and is likely to eventuate in a great success, we give the following account of the locality itself, and the means adopted for effecting its partial drainage:

This basin, which consists of an irregular depression some four or five miles across, is situated in Trinity county, Weaverville, the county seat, heing near its center. It is surrounded hy mountains and traversed by Weaver creek and its numerous trihutaries, of which its East and West Forks are the principal. It has no outlet except Weaver creek, which, escaping through a deep gorge, flows south and falls into Trinity river six miles below. Nearly the whole of this basin is composed of auriferous gravel having a great depth. Only a few feet of the surface has, however, ever heen washed, for want of fall to carry off the tailings. The Davidson flume, an immense etructurc, was huilt in the hope that it would serve this purpose, which it has almost wholly failed to do.

The plan has now been adopted of driving a tunnel through the ridge that separates Weaver basin from Trinity river, whereby sufficient fall will be secured to rnn off a deep stratum of gravel from all parts of this hasin, which for more than 30 years has heen noted for its large production of gold, it having heen one of the richest spots ever struck in the Stats. What has heen taken from it is, however, as nothing compared with what remains, if only some practicable way could he devised for getting it out cheaply.

The mining lands to be henefited by the proposed improvement compriss 11,876 acres, trihutary to which there is a water-shed covering an area of 28,000 acres. The outlet to tbsse lands has becms so choksd up witb tailings that mining can no longer be carrisd on here except in a small way. Through the construction of ths projected tunnel the business could, however, bs prosecutsd on a large scale and with great profit. This tunnel, which is to start from a point on Weaver crssk a few miles below the basin, and penstrate the ridge to the west, coming out at Steiner's Flat, on Trinity river, will be 5,148 feet in lsngth, and have a fall of 135 feet, admitting of the sluices laid in it being set on a grade of one and a qnarter inches to the box. This would take up 45 feet of the fall, leaving a dump of 90 feet. If deemed best, the sluices might be set on a higher grade, and still leavs fall enough to insure riddance of the tailings, as they would be discharged almost directly into Trinity river. Between the lower end of the tunnsl and the rivsr there is, however, plsnty of room for setting several undercurrents, and yet leave all the dump required, this being little, as the Trinity at its higher stagss of watsr carries off all the debris sent into it.

This tunnel will bs 10x10 feet, being largs enough to recsive a flums 8x8 feet, wbich latter is to carry a body of water six feet in depth flowing at the rate of 14 60-100 feet per second, discharging in that time 700 cubic fest of water. Tbis current will carry along boulders of large sizs and always prevent choking. From the upper end of the tunnel to the lower edge of Weaver basin, a distancs of about three miles, thsre is the sams fall as through the tunnel, leaving ths basin 28 feet in bedrock, and making it possible to run off the gravel at Weaverville, center of the hasin and the mines, to a depth of 123 feet lower than can be done at present. Experience here shows, bowever, that a fall of one inch to 12 feet suffices to run off tbe tailings, this heing the grade of the Davidson flume, 3,700 feet long, and wbich operated snccessfully for several years, keeping itself free as long as prevented from choking at the lower end. By adopting tHie grade the basin could be worked to a depth of 166 feet lower then would otherwiss bs practicable. The cutting of the main ditch down Weaver creek will in reality cost nothing, as this will be effected and deepened to its proper grade by mining over the ground.

Value of Mining Ground.

Ae before remarked, the surface wasbings of Weaver basin have been distinguished for their large product of gold in times past. But the lower stratum, not yet reached, is known to be much richer than the portions already run off; hesides which the bed of Weaver creek is filled to a great depth with tailings still more fertile and easily rewashed. Out of the 11,870 acres of mining ground in the basin, about 1,300 acres have been worked over, the moet of wbich is uow covered up with tailings from the higher ground. Besides lack of dump, there is encountered in the basin at various depths a stratum of cemented gravel not easily worked, which, coupled with lack of water, has tended to further cbeck operations.

Water Supply.

For introducing a large quantity of water into tbe hasin, a ditch 17 miles long has been surveyed to Stewart's fork, a portion of the flow of which, together with that of various other streams along its line, has been secured hy the projectors of this enterprise. This ditch will he 9 feet wide on top, 5 on the bottom and 5 feet deep, having capacity to carry 5,000 inches of water, which amount will be available for 8 months in the year, the supply never falling helow 1,500 inches. Along the route of this ditch one tunnel 3,000 feet in length would he required—also some rock cutting and fluming; the ground with these exceptions being favorable. It is located on a level snfficiently high to command all parts of the basin, but is not so bigh as to expose it to obstructions from snow and ice in the winter, being only 2,500 feet above sea level. It will cut on a grade of eight feet to the mile, giving it a current of very nearly five miles per hour, and a discharge capacity of 918 540 cubic feet in the same time, enough to keep the tunnel supply at an even head if properly managed. With this quantity of water a great deal of mining could be carried on in this basin where there is now but little.

The cost of building this ditch, including necessary reservoirs, etc., will he large; though nothing in comparison with the hcnefits rcsulting from the completion of the work. A good deal of money has, of course, already been expended in the purchase of mining grounds and water rights, to say nothing of cost of surveys, maps, etc. But the enterprise is in competent hands, and, possessing so much merit, will no douht readily obtain all the capital required for carrying it to an early completion.

Nevada Dividend Paying Mines.—The names of the mines that paid dividends in Nevada last year, togcther with the amount paid, is given below:

Mine.	Amount.
Argenta	$ 20,000
Belle Isle	300,000
California	1,620,000
Con. Virginia	1,350,000
Eureka Con	825,000
Independence	75,000
Indian Queen	12,000
Martin White	90,000
Ophir	100,000
Richmond Con	337,500
Total	$4,730,500

In the sculling match at Richardson's hay, Sunday last, hetween Leahy and Hoyt, ths former won in 34 minutes and 30 seconds—the best five-mile time on record.

Unwillingness of Mine Owners to Give Information.

Complaints are frequently made that mine owners are adverse to imparting information about the yield or the prospect of their mines. There is no good reason why they should be so. They indirectly act against their own intsrest by pursuing this course. By imparting information to others they stimulate them to increased exertions, and open a wider range of information for themselves. It is not necessary that they should go into the details of cost and yield so far as thsy appertain to privats business. It is not necessary for them to open their ledgers and display their profit and loss account. None but obtrusives intermeddlers would dssire to pry into private matters. But thers is a great deal of general information that could be advantageously given, which, instead of impoverishing the giver, would redound to his profit. A description of some new metbod of manipulation, an account of soms new featurs in mining, a narration of how a lost ledge was found by exploration underground, or any item that would increase the knowledge of mine working, would lead to an increased knowledge upon such matters, and to new discoveries upon points which would facilitate mining operations.

A statement of a favorable result in the work of any mine is an incentive to others to pursue a similar plan, or an inducement for them to push their prospecting still further. It would not depreciate the value of silver or gold if 20 mines of those metals were in successful operation where one now exists. Iron, copper, lead, and, in ehort, all other metals, would not deteriorate in value, if their production was greatly enhanced.

The euccess of one mine leads to tbs opening of others in the same vicinity. The result of which work is, that laborers congregate there seeking employment. Storekeepers open thcre their ehops to dispose of supplies; teamsters find their way their with loaded teams; prospectors congregate there and open new mines, giving to the oamp or district a reputation wbich it could not have gained uuder the operation of a single mine. The effect of this is, that the first or original mine is enabled to procure labor, supplies and freight at a lower rate than if it was the solitary mine in operation at that point. If no information had been given of its success, all this influx would not have occurred. Its very isolation would have retarded its advancement.

Beyond all these individual matters, tbere is a duty due to the public which demands that all information whioh does not infringe upon privacy ehould be freely disseminated. Mining is a public industry. In it, the people at large have an inherent right to receive information of its progress. They have the same right to be informed in regard to its advancement as they have to he told of the increase or dimiuution of the population, or of any other general statistics.

It is to be hoped that ths reticsnce of mins ownere will soon pass away, and that they will perceivs that their churlish method of withholding intelligence does not redound to thoir benefit.

Tuscarora Mines.—Mr. E. M. Hall, Secretary of the Grand Prizs and other Elko county (Nev.) mines, furnishes to the *Bulletin* the following statement of hullion product of 1879 of the mines represented in his office:

	Gold.	Silver.	Total.
Argenta	$ 4,423	$ 80,770	$ 85,103
Belle Isle	54,382	503,435	557,817
Endowment	.....	20,848	20,848
Grand Prize	17,720	290.729	308,455
Independence	13,238	239,992	253,230
Leopard	1,205	38,859	40,064
Navajo	1,087	17,182	18,269
Totals	$92,061	$1,191,815	$1,283,876

The product of the Argenta mine is for January, May and June. No hullion was turned out in the other months of the year. There was a valne of $5,071 of Belle Isle ore crushed hy the Grand Prize mill in January, hut the remaindcr of the product was the result of the crushing in the last seven months of the year. Out of the total product of this mine for that period, stockholders received $300,000 in dividends. The yield of the Endowment mine was mads in January, March, October and Decemher. This mine is in Esmeralda county, Nevada; all the others are in Elko county. The Grand Prize mine yielded bullion in every month of the year, except May, Novembor and Decemher. The Indenendence mine produced nothing in January, November and December, hut yielded in all the other months, and paid $75,000 in dividends to stockholders. The Leopard mine produced during six months of the year, mostly in the last half. The product of the Navajo mine was for Novemher and December. The Argenta collected $30,000 in assessments in 1879; Endowment, $25,000; Grand Prize, $125,000; Independence, $25,000; Leopard, $100,000; and Navajo, $20,000.

The Arizona Republicans have selected ex-Governor Safford and Levi Bashford as the delegates to thc Chicago Convention.

News from the Skagit mines is to the effect that from five to six feet of snow covers the ground on Ruby creek.

Legislative Matters.

The best thing the Legislature has yet done is the repeal of the obnoxious Boiler Inspector bill, a measure which passed four years ago, but never was put into operation. It gave the inspector a very fat office, some $35,000 a year, and made him an autocrat over the destinies of the iron business in this city. The foundrymen will breathe a sigh of relief to know that there is no longer a possibility of extortion in this direction. A hard fight had to be made, however, to secure the repeal of the bill.

In the Assembly, Brusie has introduced a bill authorizing Supervisors to establish the price of water in placer and hydraulic mines.

Satterwhite has brought in a bill which provides that any private person may, by action, inquire into the due incorporation of any company, a matter before only in the power of the Attorney-General.

Mr. Chase's new bill requires that 10% of the capital stock of corporations shall be paid in before the act of incorporation.

Gorley's bill, to compel officers of stock corporations to sell to the highest bidder, has been withdrawn.

The Committee on Mines and Mining have reported favorably on Bill No. 57, regulating the sale of mining stocks.

Fox's bill, relating to the removal of mining company officials, has been reported on favorably; also Felton's bill, relating to purchase and alienation of mining lands.

Bill No. 248, relating to the removal of mining directors—one-fourth of the stockholders to call a meeting, instead of one-half, as now—has been reported upon favorably.

In the Senate three bills have been introduced by Mr. Johnson by request, relative to debris. One is in relation to the parties to, and place of trial in actions for injuries arising from tailings or debris from the mines. Another is an act to prevent the running of tailings upon lands of another, making it a misdemeanor. Another is an act relative to parties in action to recover damages from injuries from the flowing of tailings. All three of these bills have been referred to the Committee on Water Rights, Irrigation and Drainage.

Hittell's bill providing for the removal of officers by a majority of stockholders in mining corporations came up.

Conger offered an amendment giving actual holders or owners of stock the right to vote and take part in the proceedings, notwithstanding that the stock is held in the name of a trustee.

Traylor opposed the amendment on the grounds that it would increase the evil that it sought to remedy.

Neumann also spoke against the Conger amendment, stating that if a man held stock and desired to take part in the business of the corporation, he should see that his name is on the books.

Traylor said that to allow holders of stock to vote, would be to allow parties who had borrowed stock, with no interest in the corporation, to attend meetings and control them.

Nye could not understand why trustees should be allowed to vote if holding no interest in the corporation.

Enos supported Conger's amendment as one means which would remove the dishonesty that characterized stock operations.

Johnson said he would give *bona fide* stockholders the right of voting, but he could not see how the amendment would accomplish the object sought, because in the first section of the bill it was required that names on the books of the corporation were evidences of ownership.

Hittell explained that the difficulty under the old law was that the books were closed ten days before the day of meeting, whereas under this bill the holders of stock, if properly indorsed, can have their names inserted in the books of the company five minutes before the time of meeting.

The amendment of the Committee on Corporations, that only those whose names appear on the books of the corporation shall have the right to vote, was adopted.

The amendment offered by Conger was defeated—ayes 8, noes 15.

Enos moved to amend Section 1 by striking out the words "on the books," thus giving holders and owners the right to control, whether their names appear on the books or not. Lost—ayes 11, noes 14.

After some further discussion the bill was recommitted to the Committee on Corporations.

The Assembly Committee on Mines and Mining has agreed to report favorably on Gorley's bill, regulating the sale of mining stock. The principal provisions of the bill are as follows:

"An act to limit and regulate the sale of mining and other stocks." First—All purchase and sale of shares of any incorporated company, under the laws of this or any other State, in any stock board, mining exchange, or auction mart, in this State, is hereby prohibited other than in manner herein prescribed, and every violation of this act is declared to be a felony, except as hereinafter prescribed, and upon conviction in any court of competent jurisdiction, shall subject the offender to a fine of not less than $1,000 nor more than $10,000, and imprisonment in the State prison not less than six nor more than 12 months, at the discretion of the Court.

Second—All sham or wash sales and all sales where there is no money, or where there is less than a full money consideration paid, accompanied by a surrender of all stock of shares bought and sold, are hereby prohibited.

Third—It is hereby made incumbent upon all stockbrokers to furnish their customers within 48 hours (Sundays and legal holidays only excepted) after making such a sale or purchase, a written or printed list of the stock or shares sold or purchased for such customers, specifying the session of the stock board at which such sale or purchase was made, stating the true purchase or sale price, and also the number of the certificate of stock sold or purchased.

Fourth—Brokers are hereby prohibited from using, loaning, hypothecating or selling any stocks on hand belonging in whole or in part to a customer; but they shall hold all stocks that may come into their hands, belonging in whole or in part to their customers, inviolate, and shall at any time, upon demand and upon payment of all arrearages upon the same, deliver up the identical stock purchased for him, and none other.

Fifth—The Secretary or Clerk of every stock board, stock exchange and auction mart, shall keep a correct list of all stock transactions in his board, exchange or mart, shewing the name of the seller and purchaser, the number of shares, and the price at which the same was sold and purchased; and this record, so kept, shall be open to inspection during usual business hours to any and every person having stocks bought or sold in such board, exchange or mart; and it is hereby made the imperative duty of such Secretary or Clerk to furnish to such customer or customers, upon demand and upon payment of the Notary's fee therefor, a sworn statement of the transactions of any session or sessions of said board, exchange or mart, and, upon failure to furnish such sworn statement, such Secretary or Clerk shall be deemed guilty of a misdemeanor; and, upon conviction, shall be subject to a fine of not less than $100 nor more than $1,000, and shall be imprisoned until such fine is paid or satisfied.

Foundry Notes.

The Pacific Iron Works have recently been turning out a very considerable amount of mining machinery of various kinds, among which is a larged sized Howell-White furnace, with salt feeders, shafting, pulleys, etc., for the Ontario mine, in Utah.

They have also sent recently a Howell-White furnace to the Bajada mine, Mexico.

A ten-stamp silver mill in sections, and very complete, has been shipped by them to Peru, a duplicate in style to the 80-stamp mill built by them for the Cerro de Pasco mine a year ago.

They are also building a water-jacket copper-smelting furnace for the San Francisco copper company of Nevada county. Several copper and galena ore furnaces are being built for various parts of Arizona.

The works have now on hand a 20-stamp silver mill for Globe district, Arizona, with pumping and hoisting machinery for the same district.

POSTAL INDEX.—A little publication of great value to those who write letters (and who does not?) is the "Pacific Coast Postal Index," just published by L. P. McCarty, Box 2,272, San Francisco. It gives a full list of Pacific Coast postoffices and express offices, the county and State in which each is located. It also gives the rates of foreign and domestic postage. Now that the Government is extra anxious that every letter should be properly addressed, it is well to have an "index" to give all the points. The "P. C. P. Index" can be had for 20 cents by sending to the publisher as above.

The Centrifugal Creaming Machine.

The interest in the reported revolution in butter making, which promises to banish pans, racks and cream jars from dairy practice, leads us to present sketches of one of the devices lately brought out in Europe for removing cream by centrifugal motion. The engravings are not as perfect as we would like to have had them, but we hope from them and the description below, some general idea can be had of the way in which the skim milk is thrown away from the cream, and both forced to deliver themselves in separate streams.

It will be understood from the engraving, Fig. 1, that the case, standard and base plate are in one casting, so that the bed plate may be bolted to the floor or framing of the intermediate motion. But details in fixing the separator will depend upon the motive power, the position of the separator itself in the dairy, and other circumstances which dairy farmers will have no difficulty in determining, as the whole is simple and capable of any application, so that each dairy may have its own plan in fixing the intermediate motion and separator if necessary.

In the engraving, Fig. 2, *A*, is the rotating chamber in which the separation of the milk and cream takes place. It is made of best Swedish steel, forged into the form of an oblate spheroid and then turned truthfully inside and outside.

The chamber, *A*, is fixed on top of the vertical shaft, *K*; the lower bearing of *K*, is on a small piece of cork in a friction cup in the top of the spindle, *h*, of the driving pulley, which has an adjustable bearing, *i*, below, as shown in the cut. The upper part of the shaft, *k*, rotates in the stuffing box, *g*, provided with an elastic packing ring and self-lubricating cup. The bearings of the pulley spindle, *h*, are also self-lubricating. The cover, c, of the chamber, *A*, is in the form of an inverted funnel, the mouth of which is bolted to the top of the chamber by four bolts, two only of which are seen in the section—Fig. 2. To prevent the atmospheric action of the nuts of the bolts inside the case, a cap (not shown in the cut) fits neatly over them. Immediately below c, is another funnel with a pendant tube, *b*, from one side, as shown in the illustration. The former, *c*, *c*, is the milk funnel, and the latter the cream funnel. A broad collar fits loosely on to the top of *c*, *d*, for the purpose of guiding the milk into the receiver, *B*. The top of the cream funnel is also surrounded with a collar for guiding the cream into the receiver, *C*. The receivers, *B*, and *C*, are of the nature of funnels, each having a discharge pipe. They are made separately of white metal, the pipes forming handles. *B*, fits on easily to the top of the lid of the outer case, and *C*, fits on to *B*, whilst a cover fits on to *C*. The receivers, *B* and *C*, being circular, the discharge pipes can be placed to deliver the milk and cream on any side of the separator, either both set for discharging on one side or on opposite sides. The supply tube, *a*, is screwed into the bottom of the chamber, *A*, centrally with the main vertical shaft. It has two discharge pipes, opposite each other as shown in the sectional view. The upper end of the supply pipe rises a little above the cover—best seen in the profile at the top (Fig. 1,) with sufficient space all round for the escape of animal odor.

The vessel for supplying the whole-milk is not shown in the cut, but the cock will be understood as proceeding from it. The mouth of the cock is held in position by a three-legged stay, not shown in the section.

In the internal arrangement of the separator there are three concentric tubes, to which special attention requires to be called. First, there is the central tube, *a*, down which the milk flows, with its two exits at the bottom of the chamber, *A*. Second, there is the cream tube which surrounds *a*; and third, the milk tube, which surrounds the cream tube. All the parts, tubes, collars and funnels, are so designed as to be easily taken to pieces for being cleaned and put together again for work by any unskilled laborer—the only education required being to see the thing once done.

FIG. 1.

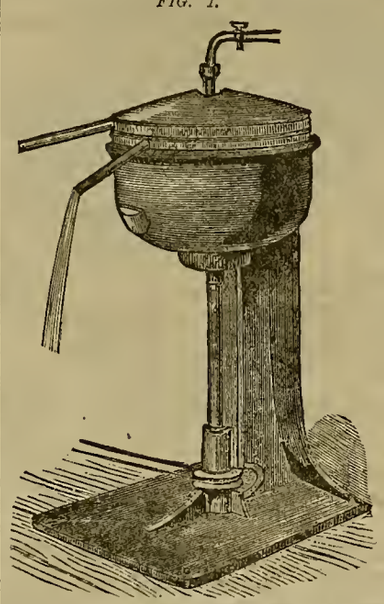
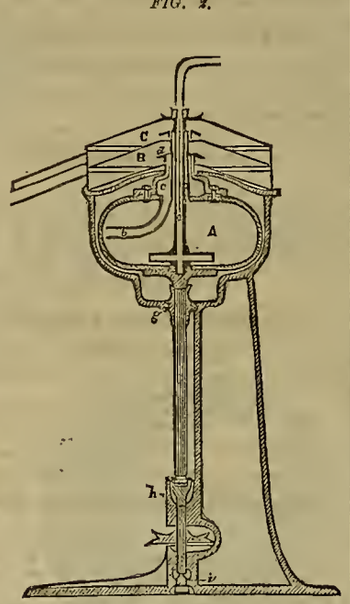


FIG. 2.



THE LAVEL CENTRIFUGAL CREAM SEPARATOR.

The action of the separator is as follows: When the power is turned on, the application being by friction gear throughout, the speed gradually rises, and when the chamber, *A*, attains about 6,000 revolutions per minute the tap above is opened, when the milk flows down into the chamber, *A*. The calculated speed is, of course, determined by the intermediate motion, and it is easy to see when this has been communicated to *A*. Thus at first the mouth of the supply pipe at the top is seen to move, but when once the desired speed has been attained it appears at rest, like a top when spinning at full speed; and, like the top, too, it stands vertically erect, as if at rest, without any vibration, although making 8,000 revolutions per minute, which is about the maximum speed. But to effect this, in fixing the separator the common axes of the pulley spindle, *h*, and the main shaft, must be vertical. To insure this, the mouth of the outer case, on to which the lid fits, is turned true at right angles with the central axis. This being done, the outer case can be properly fixed by a spirit level. The work of fixing is thus simple, but it has to be accurately done.

The separation of the milk from the cream is effected within the chamber, *A*, by centrifugal action. The cream and milk mixed together as they come from the cow are thrown toward the walls of the chamber, where the separation commences. Close to the small supply pipe, *a*, about an inch in diameter, centrifugal force is almost *nil*. It is necessary to bear this closely in mind in order to comprehend the course which the globules of butter take on their way to the exit from the place in which they are first deposited in the chamber, *A*. The (so to speak) skim-milk tube is fed from the outer portion of the revolving contents, and the cream tube from the inner portion next the axis. It is there the cream finds itself, owing to the denser milk being thrown outwards; and the escape being urged both by centrifugal action and head pressure alike, the outer and inner portions of the contents are delivered by two different tubes at two different spouts, the one of them rich and the other poor in butter globules. The milk, thus delivered free from cream, yields, in fact, less butter than skimmed milk when the cream is raised in the common way.

Without going further into the consideration of this subject, the path of the butter globules is no doubt an upward curve toward the exit. Were a chamber made with side walls of glass sufficiently strong to bear the speed of 8,000 revolutions per minute, the path of the cream would be seen, whilst the more important question would be determined as to whether the form of Mr. de Laval's chamber is the best that can be made in its minor details. In principle, its construction appears to be sound, and the small percentage of butter left in the milk may be taken as presumptive evidence that the whole may yet be removed by the inventor. The principle of construction practically is two-fold—first, the separation of the milk by the tube, *b*, at the extremity of the radius of an oblate spheroidal chamber revolving on its minor axis; second, the removal of the cream by a central tube surrounding the entrance pipe.

The milk and cream are discharged above, each in a very thin sheet, by centrifugal action. The receivers, *B* and *C*, with their respective collars, are stationary, and incline each downward, in the form of an obtuse cone, to the spouts. Down these inclines the milk and cream flow, spreading thinner and thinner towards the perpendicular rim of *B* and *C*, thus affording a ready means of escape for animal and other odors and gases, and without the milk coming in contact with the atmosphere, which is objectionable, especially when it (the atmosphere) is loaded with microscopic germ life, as it generally is.

When all the milk has been separated from the cream, the speed of the rotating chamber is allowed to slacken. A portion of the separated milk is then put into the supply vessel, and as this flows down through *A*, into the chamber, it forces up the cream by head pressure, and thus all the fluid is put through.

Separators are made of different sizes. The size shown at Kilburn is 11 inches by 4 inches inside, and holds 10 pints. It separates about 30 gallons per hour, and the price, $140, is exclusive of the intermediate motion, the cost of which will depend upon how the separator is fixed. Hand machines are so easily driven that they can be worked by a foot-treadle, like a spinning wheel. Besides separating cream and milk, the machine will separate other liquids of different specific gravity, such as tar from water, etc.

THE steamer *Bengore*, from Penarth for Gibraltar, foundered when two days from port, drowning 13 persons.

PARNELL delivered an address Monday evening in the hall of the House of Representatives at Washington.

DURING January the public debt of the United States was decreased $11,014,263.

Our State Fish Farming.

From the biennial report of Hons. B. B. Redding, S. K. Throckmorton and J. D. Farwell, Fish Commissioners, we extract the following items relating to the progress of pisciculture in this State:

There is reported an increasing public interest in fish culture and in the efforts of our Commissioners to continue the supply of valuable food fish in our waters. The destruction of fish during their seasons of reproduction, in defiance of law, once thought to he hut a venial legal offense, is beginning to he considered a serious crime. As population increases, and railroads and other means of transportation are extended, there is a larger demand for fish; this is met hy an increase in the numhers of fishermen, hy extending the area of the fishing grounds, and hy improved processes of capture.

One-half of the annual appropriation placed at the disposal of the Commissioners is expended in the hatching of salmon eggs and placing the young fry in the trihutaries of the Sacramento river. From the organization of the Commission, and including the year 1879, there has been hatched and turned into the Sacramento river, 13,150,000 young salmon; these, added to the natural supply, have heen sufficient to make them as numerous in the river, during their seasons, as they have been at any time since so large an area of their spawning heds was destroyed by the operations of mining. If there could he a faithful observance of the law that prohihits the catching of salmon during the close season; if the fish could have the river free from nets during these six weeks, and he allowed in peace to reach their spawning grounds, there would he no necessity for an increased appropriation, even if canning establishments were doubled and fishermen mnltiplied in the same proportion.

Through the kindness of Prof. Baird, U. S. Fish Commissioner, there has heen received from Lake Michigan, as a donation, nearly 1,000,000 eggs of white fish.

Some of the previous importations of these fish, planted in Tahoe, Tulare and Clear lakes, have thrived, and a few mature fish are reported as having been caught in each of these lakes. All of these bodies of water will, without doubt, within a few years, be stocked with this valuable fish.

In June, 1878, there were received from Prof. Baird, U. S. Fish Commissioner, from Havre de Grasse, 115,000 young shad; these were placed in the Sacramento river, at Tehama, where all previous importations have been planted.

In 1874, the Commission imported from the Raritan river, and placed in lakes near Sacramento, 74 Schuylkill catfish. They have increased to millions and furnish an immense supply of food. They have hecome so numerous that they are as regularly on sale in the city markets as the most abundant native fish, and are sold at ahout the same prices. They thrive in our rivers and lakes, and in the still-water sloughs of our plains, as well as in the brackish sloughs in our tule lands. They appear to he equally at home in lakes on the mountains and in artificial reservoirs in the valleys. Many farmers who have natural ponds on their farms, or who have surplus water from wind-mills and have made artificial ponds, have stocked them with this excellent fish.

In January, 1878, there were received from the United States hatching-house of Grand Lake Stream, Maine, 50,000 eggs of the land-locked salmon.

As they are natives of the cold lakes of Maine the most appropriate places for the distrihution of the young fish would he in our mountain lakes; hut, for the purpose of testing their fitness to thrive in warmer waters, a portion were also distributed to lakes in the valley and on the coast.

In January, 1878, and in Jannary, 1879, we received from Wisconsin and New Hampshire 70,000 eggs of Eastern brook trout. The young fish were hatched at the State hatching-house, San Leandro, and were distrihuted throughout the State.

The Commission has heen unahle as yet to introdnce the king carp, with which to stock our inland slonghs and warm water lakes. This, the most valuahle variety of the carp family, was imported from Germany hy Prof. Baird, United States Fish Commissioner, a few years since, and has increased to large numbers in ponds at Washington and Baltimore. They could not he obtained in July, at the time Mr. Stone left with fish for California. They hope to receive the Stato's quota in June, 1880, with another consignment of young shad. It is certain they will thrive in California, as another variety of carp, imported as a private speculation some years since, has heen extensively distributed over California, and now furnishes a large amount of food to people in the interior valleys.

A few suits have heen commenced to compel the owners of dams to construct fish ladders. In almost all cases, when notified, the owners of dams have complied with the law. It is generally understood by the people of the State, that to preserve fish in our rivers, it is ahsolutely necessary that fish should be allowed to reach their spawning grounds.

The report concludes with an essay by W. N. Lockington on the food fishes of San Francisco. Those interested in the subject could douhtless obtain the document by addressing the Commissioners.

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Testing and Working Silver Ores.

The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope:

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, bas something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Krochnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mecbanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners' and prospectors' use. Price, post free, $2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 202 Sansome Street, San Francisco.

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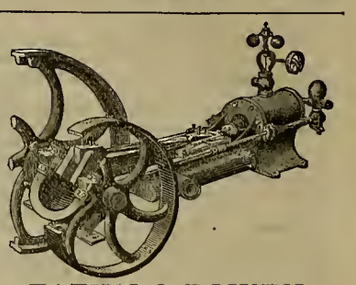

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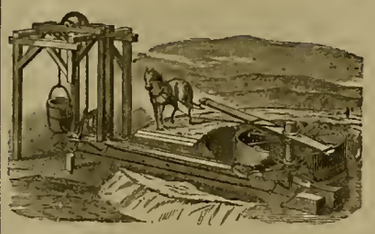

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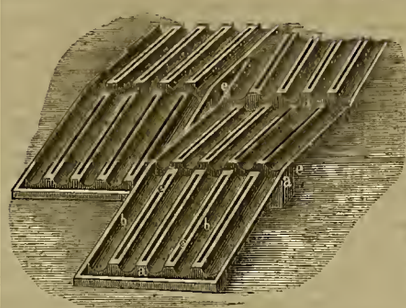

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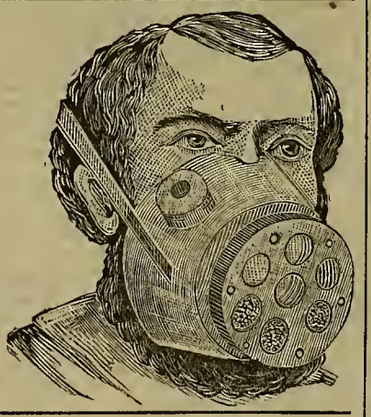

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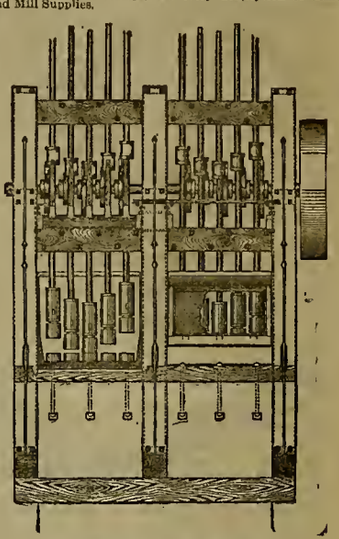
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chlorodizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



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We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

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We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Hueme, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

Mines and Works of Almaden.

Translated from "Annales des Mines"

BY S. B. CHRISTY.

Full geological description of this famous Quicksilver Mine, illustrated by maps and plans of the works. Complete description of the Quicksilver Furnaces and Condensers, etc. 48 pages octavo—paper cover—price (post-paid) 50 Cts. Published and sold by DEWEY & CO., 202 Sansome Street, S. F.

[CONTINUED FROM PAGE 85.]

said to he one of the finest prospects in camp. On the Ada, Cochise, Ella, Pensacola No. 2, Waco, Falcon, Wabash, Mazeppa, and many others work is being steadily pusbed.

BLUE TOP.—Tbis claim, situated west of the Alta, in Patagonia district, was sold last week by Dan Rooney to Messrs. Williams and Topliff, of this place, for the sum of $7,000.

REDEEMER.—The Redeemer is situated two miles north of old Cerro Colorado camp. The entire lode, 6,000 ft, carries the same character of ore, gray carbonates and sulphurets, giving an average working assay from 25 pounds of rock, of $110. A tunnel 300 ft, run on a cross lead, shows ore all the way.

HEINTZELMAN.—Work will soon be resumed on the old Heintzelman claim, and the shaft sunk from its present depth, 200 ft, to a depth of 500 ft. There havo heen two very large pockets of native silver found in this mine.

ORO BLANCO ITEMS.—*Arizona Star*, Jan. 29: The main shaft in the Warsaw is down 140 ft, and has a good showing of ore on the bottom. The Alaska shows five ft of ore at the bottom of the 205-ft shaft; the tunnel to strike the other vein at 230 ft, perpendicular depth, is in 375 ft. A Red Oak, Iowa, company is doing work on the Californian mine, which is showing up splendidly. The Austerlitz has two 50-ft shafts, at the bottom of which drifts are being started. The ore is found in a vein of from two to three ft in width, and gives a good showing in gold. The Osceola company are working the Peelstick, which has a 115-ft shaft, from which a 75-ft crosscut has been run. The crosscut has reached a body of ore five ft in width. The same company are commencing a shaft on the Osceola mine.

COLORADO.

ROBERT E. LEE.—Boulder *News and Courier*, Jan. 23: On the 13th inst., this mine, which is located at Leadville, put out 95 tons of ore in 17 hours, and the ore yields an average of over $1,250 per ton, or an aggregate of $118,500 for the day's work.

SILVER STAR.—Fairplay *Flume*, Jan. 22: This mine has made one of the richest strikes in Park county. It is located on Copper mountain. It was bonded for $6,000

SILVER KING.—Silver Cliff *Prospector*, Jan. 27: The shaft is down 20 ft, sbowing very fine ore. Threo assays of ore from the lode run 120, 57, 67½ ounces silver to the ton.

RATTLESNAKE.—Ruby silver was found in the lode. The specimen exhibited is as rich as any we have yet seen.

ROBERT BURNS.—Has struck a large veiu of galena as rich as any discovered in this section.

IOWA.—Is in the chloride belt; has an abundant supply of rich ore, and is turning out more thau ever.

SUNRISE.—Shaft down 115 ft, and being worked with the most encouraging results, ore running 400 ounces silver, being the output from a vein four ft in thickness.

LADY FRANKLIN.—The company have sunk a shaft 60 ft. At this depth a drift was started northwest, which has reached 65 ft, and a shaft is being sunk at the extremity of the drift where a vein four ft in width containing carbonates has been cut.

REPUBLICAN.—Shaft down 23 ft, at which depth a well-defined vein eight ft in width, carrying gray copper which runs 100 ounces silver, has heen cut.

WEST MOUNTAIN.—Chlorides running high in silver have been found. It is contiguous to the Cliff lode.

HEATHEN DUTCHMAN.—Has struck ore which is valued at 400 ounces to the ton.

CALIFORNIA.—Ore now taken out assays 3, 8, 84, and 265 ounces silver to the ton.

SILVER HORN.—Tests of ore, taken without selecting, show 12, 4, 10, 152, 1,850 and 3,540 ounces, with an improving richness in quality and quantity as development progresses.

RACINE BOY.—Six silver bricks, weighing 20 pounds each have been made from a five days' run of the mill, and more are to come.

POLONIA.—Denver *Mining Review*, Jan. 22: Shaft down 102 ft; 1st level, 30 ft above. Sump at 72 ft showing ore of $100 value. The vein at this depth is from 2 to 16 inches wide.

BUNKER HILL.—Shaft down 86 ft; ore veiu, 12 inches; character of ore, galena, iron pyrites, gray copper; value, 70 ounces per ton.

OREGON.

MINING ITEMS.—Jacksonville *Sentinel*, Jan. 28: Piping at the dry diggings, at Crant's pass, is going on night and day with a full head of water. Keaton & Klippel, on Poorman's creek, are working with a good head of water and prospects flattering. The Squaw Lake Co. have heen interrupted by slides, but Supt. Klippel expected to be piping again on Saturday last. Miners on Foot's creek are tearing the dirt up in that camp at a lively rate. Plenty of water and a good prospect for a harvest of dust. Jackass creek is unusually flush and every miner is busy. A very large amount of the rich dirt of that camp will be moved before the season ends. Sturges & Co. have a force of 16 men ground sluicing in their two claims, and have already moved more dirt this season than was moved all last winter. Pipe laying at the '49 diggings, owned by E. K. Anderson, was completed on Saturday and work commenced in earnest. Thos. Kahler brought into town yesterday, a nugget of gold and quartz weighing five and one-half ounces. It was taken out at the Fort Lane diggings, and is worth about $60. The operations of the Sterling hydraulic company have been retarded by numerous slides in their ditch owing to melting snow. The English aud Blue Gravel companies, on Calico creek, are piping with a full head of water, and moving immense quantities of dirt. Oreen Bros. are again crushing rock from the Sugar Pine ledge; work having heen suspended for a short time during the frecze. Ecklesou & Chappel have a full force on their claim working night and day with an amplo hydraulic head of water. The Kahler & Lackland claim, on Applegate, are now running night and day. The pipe is tearing up ground that prospects exceedingly well. The Willow Springs camp has still abundant water, every miner being husy. The arrastra of Egan & Co. is still crushing good rock with the best of prospects for plenty more. Thos. Mee, on Foot's creek, is working his small hydraulic very successfully with a prospect of a rich clean-up. More than wages is picked up daily in pieces weighing from $2.50 to $5. Saltmarsh & Co., on Sterling creek, have a splendid head of water, and are keeping it busy ground slicing. This company use a small pipe with a light pressure to facilitate moving the dirt in the ground sluice.

PRODUCTION AND TRADE.—The "Annual" of he San Francisco *Journal of Commerce*, which was issued Jau 24th, is in some respects the most valuable trade paper ever issned in this city. In addition to the usual review of the market course of different articles of produce and merchandise during the preceding 12 months, there were this year tables occupying two of the mammotb pages of the *Journal*, giving the exports of this port for each of the last 12 years, the countries to which the exports were made, etc. These were from the recorde of the Merchants' Exchange, and afford an opportunity to etudy the courses of the city's commerce, which has never heretofore heen enjoyed by the public.

ARRANGEMENTS for a royal procession are making in London on the occasion of the opening of Parliament, Feb. 5th.

THE death of Very Rev. Frederick Oakley, a Catholic writer on religious subjects, is announced.

Hofmann's Patent Process.

EDITORS PRESS:—Allow me once more to troubls yon for a space in your paper in relation to articles concerning Hofmann's process. Mr. Aaron argues that the "Hofmann process is not a combination but a succession of known processes; they are coupled not combined." I think Webster could not have done better. Patents on a combination (or coupling) of by themselves not patentable processes like Hofmann's patent, are just as sound as patents on new inventions. The combination is simple of course, but effective. Mr. Aaron states that he extracted $50 worth of gold out of $84 by the Patera process. This is over 50%, and proves that the gold was es a chloride in the ore, and in this case the Patera processs certainly must extract it.

I always considered that Mr. Aaron knew what he was writing about, if intended for publication, which seems not always to be the case; end I wonld advise Mr. Aaron to be more careful in future and to bs sure of the truth of what he is writing. He professes to be in possessiou of a pile of my tailings assaying $28 per ton. I do not dispute the $28 if Mr. Aaron found so much by assay, but who informed him that those tailings are from my treatment? Mr. Aaron is the fifth Superintendent at thoss works since I left, and if he finds pilcs of tailings there, I am sure they smelt all aliks, consequently he had no means to find out which is which, hnt it just suited him on the present occaeion to attribute it to me. If the Hofmann process had been known and applisd at that time when the ore of those tailinge was under treatment, the tailings would certainly not assay $28. In conclusion I wonld remark as to his sign of interrogation, that ons person has the same right to defend as the othsr to ettack.

Mr. Deetken took up the pen in a very bad humor and substitutes my worde too often with others that suitcd him better. He denies that he wrote the following in his first letter: "I find an article (on treatment of gold ores by Hofmann) coneisting of an application of the Patera process precsding the Plattner process with salt roasting, as introduced by me at ths Eureka mine." Mr. Deetken says this means that he iutroduced ths salt roasting. After many words without interest he undertekes to look iuto the facts, and there he discovers that Hofmann, after extracting the silver, wae surprised to find his "tailings" rich in gold and takes refuge in the Plattner process. Then it troubles Mr. Deetken whether Hofmann's "good way of treating ore" could be a new process or not, and whether Hofmsnn would still claim it his patent if the Kiss process were substituted by Patera's in his combination, and wants ms to answer tbe important question, while he knows himself well enough that wbat is not expressed distinctly in the patent can not be claimed.

I am glad to heer from Mr. Deetken thet he has no patent on Plattner's chlorination, because until now many persons thought he had; but in regard to his "system of apparatus" and the insolent expression that I used his fixings, which be calls a "system," I refrain from further explanation on account of the pending lawsuit.

The "conclusion" of Mr. Deetken in turning the table and ths elegant style of his writing show that he was not in his normal condition while writing; nevertheless I will tell him that I did consent to take in some of his experiences in chlorination in my publication, giving him always credit, as it was my object to introduce to the mining pnblic a young man who went through a polytechnic school and tried his luck in a branch of metallurgy new to him, in which he was instructed in Grass Valley by Mr. C. V. Bescler, a graduate of the Royal Mining Academy at Schemnitz, where the chlorination of gold sulphurets was practised. G. KUSTEL.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Richmond, Jan. 27, $11,328.08; Jan. 25, one week, $29,014.12; Wells, Fargo & Co. Eureka, Jan. 25, $2,551.95; one week, $14,846.84; Eureka Con., Jan. 25, one week, 229,280 lbs.; Jan. 27, in three days, 74,185 lbs.; Wells, Fargo & Co. Pioche, Jan. 25, one week, $7,334.13; at Eureka, Jan. 30, $2,000; Con. Virginia, Jan. 27, in Jan. to date, $136,560.75; Jan. 30, $3,025; Wells, Fargo & Co., Jan. 27, $1,100; Belmont, Jan. 27, $4,399; Hillside, Jan. 29, $5,200; Paradise, Jan. 29, $3,913.94; Owyhee, Jan. 29, $2,500; Californie, Jan. 31, $57,454.64; Ophir, Jan. 31, $14,558.41; Sierra Nevada, Jan. 31, $14,545.28; Union Con., Jan 31, $25,595.03; Northern Belle, Jan. 28, $6,387.03; Christie, Jan. 24, $2,220.45; Jan. 27, $1,989.14; Jan. 30, $2,054.53; Ontario, Jan. 23, $3,374.81; Jan. 24, $3,143.29; Jan. 26, $7,099.08; Jan. 27, $4,757.09; Jan. 28, $4,776.99; Jan. 29, $4,629.55; Jan. 30, $3,274.76; Yosemite, Jan. 24, $2,500; H. S. M. Co., Jan. 24, $10,000; Jan. 26, $7,500; Jan. 28, $5,000; Morgan & Germauia, Jan. 24, $10,080; Jan. 26, $10,450; Jan. 28, $7,950; Jan. 29, $21,650; Jan. 30, $2,890; Horn Silver, Jan. 30, $8,240; Lucky Cuss, Jan. 28, $2,000; Silver King, Jan. 26, 14,300 lbs., concentration; Eureka Con., Jan. 30, 48,845 lbs.; Richmond, Jan. 30, $19,063.72; Tombstone, Jan. 1 to Jan. 27, inclusive, $42,452.48; Stonewall Jackson, Jan. 1 to 24 inclusive, $20,469.21; Christie, Feb. 3, $7,867.

News in Brief.

GOUT is again troubling Beaconsfield.

PAUL DEVOUX, the Belgian politician, is dead.

YELLOW FEVER has broken out at several places in Brazil.

PIERRE ERNEST BERSOT, the French scientist and author, is dead.

ABBE DE BRAZE, in attempting to cross Africa, died at Ujiji.

THE deeth of Peul de Cassagnac's fathsr is announced from Peris.

COL. W. S. WATSON, civil enginesr, died at Marysville Saturday last.

BRUNEREAU, the notorious Colonel under ths Paris Commune, ie dead.

DURING the recent storm ovsr fivs inchss of snow fell at Tucson, A. T.

THE Moors at Fez, Morocco, rscently attecked the Jews, wounding several.

THE severest weather ever known in thet locality recently visited Sitka.

THE Indian Appropriation bill appropriates $219,533 less than last year.

A PARTY of eight robbsrs were recently killsd in Dakota by their pursuers.

JOHN LOCKE, Liberel member of Parliament for Southwark, Eng., is dead.

THE total coinage of the Unitsd States Mints during January was $9,576,500.

THE independence of Roumania has besn recognized by Holland and Greece.

THREE deaths occurred last week from starvation near Parsontown, Ireland.

AT Mount Weshington, Fridey last, the wind blew at the rate of 132 miles an hour.

THE Lsopold Cross hes been conferred upon Rosa Bonheur by the King of Bslgium.

THE investigation in connection with the colored exodus is proceeding at Washington.

LEON SAY has been elected President of the Finance Committee in the French Senate.

THE deeth of Sir Dominic John Corregan, the eminent Dublin physician, is ennounced.

FREEMAN, the Pocasset (Mass.) child murderer, has besn ordered to the insane asylum.

THE Western Iron Association et Pittshurg have advanced the price of iron to four cente.

THE trouble in the English cotton tradc continues, the operatives striking in severel localities.

THE French budget for 1881 estimates the expenditures for ths year at 2,773,391,473 francs.

THE railroad suit against Tilden and others has been virtually settled by a compromise of judgment.

THE menager of the Shepberd's Fold in New York has been indicted 25 times for ill-treating children.

THE first arrival at New York of colored people leaving the South reached that city Monday last.

A MONUMENT ie to be erected in commsmoration of Gen. Stark's victory over the British at Bennington, Vt.

Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Mondey evsning last, President Davidson in the chair. Messrs. A. T. Dewey and W. B. Ewer (of the MINING AND SCIENTIFIC PRESS) and Dr. J. B. Trembley were elected resident members.

Among the donations to the museum were some specimens of wild rice from Mr. Simpson, who had endeavored to maks it grow here in this Stats, but with no success.

Mr. Redding steted that, although Indien rice was originally found in the lakes of Wisconsin, and of the territory of the Northwest, it had been made to grow as far south in the Southern States as Arkensas, but that all efforts to make it grow in the California lakee had yet been uneuccessful. This was to be regretted, as one very valuable result of its growth was its irresistible attraction to all varieties of edible aquatic birds, which followed in great quantities its growth to localities where they had never before been known.

J. D. Stillman, of the University of California, read the result of a chemical analysie of the gum found on the *Torreya Mexicana*, commonly known from its odor as the creosote plant, sent from Arizona by Mr. Culbertson. The analysis proved the exudation on this plant, after the boring of it by a certain insect, to be essentially the same as that from which the stick lec, the gum lac, and the shellac of India, and one of the great sources of India'e wealth, is obtained. This creosote plant, called aleo grease-wood, growe abundantly in the lower part of Tulare valley and on the Mohave desert.

Mr. Redding and others, who know the plant, say that the exudation occurs only where the insects affect it, and this is chiefly in Arizona. The uses of the gum are various, and extend from those of wax for the wild flax-thread ueed by the Indians, to solder used by the Mexicans, and the cure of rheumatism for any person.

Mr. Stillman also read another interesting paper, ehowing the results of an analysis of the oil of the leaf of the California laurel or bay tree. He is pursuing still furthcr investigations with the oil, having found many interesting circumstances connected with it.

Dr. Behr read a paper on the gradual change of the flora of this peninsula, and on the supplanting of the native growths of all countries by those Africa and Europe, but of the latter particnlarly.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING JANUARY 6TH, 1880.

223,308.—WINDMILL—J. F. Barkor, S. F.
223,277.—LAWN SPRINKLER—C. Chamberlain, Santa Rosa, Cal.
223,279.—STRAW BURNING BOILER—H. K. Day, San Jose.
223,281.—ORE CRUSHER—P. C. DuBois, Copper City, Cal.
223,287.—SAFETY CLUTCH—B. E. Henriksen, S. F.
223,387.—KEYBOARD—C. C. Reynolds, Kelseyville, Cal.

FOR THE WEEK ENDING JANUARY 13TH, 1880.

223,581.—ROCK CRUSHER—E. Coleman, S. F.
223,529.—ROCK DRILLING MACHINE—H. Morse, S. F.
223,605.—SPARK CONTROLLING STACK FOR BOILERS—J. W. Pearce, Suisun, Cal.
223,543.—DRESSMAKERS' CHART—M. E. Riley, Harrisburg, Oregon.
223,554.—FLOUR-BOLT—A. J. Terry, S F.

FOR THE WEEK ENDING JANUARY 20TH, 1880.

9,048.—FEEDER FOR QUARTZ MILLS—T. A. Cocbrane, S. F. (reissue.)

FOR THE WEEK ENDING JANUARY 27TH, 1880.

223,875.—HORSE POWER—R. M. Beebee, Chico, Cal.
223,881.—SULKY PLOW—I. Burke, Sacramento, Cal.
223,800.—PLAITING MACHINE—J. E. Chenatte, Hillsborough, Ogn.
223,845.—DYNAMO-ELECTRIC MACHINE—S. D. Field, S. F.
223,804.—STEERING APPARATUS—J. Oates, Portland, Ogn.
223,913.—EXTRACTING METALS FROM ORES—O. Hofmann, Monitor, Cal.
223,922.—DUMP CAR—J. Jones, Lakevills, Cal.
223,819.—MITERING MACHINE—T. Schreppel, S. F.
223,823.—ORE STAMP—H. H. Taylor, Oakland, Cal.
225,964.—BAND SAWING MACHINE—O. M. Van Riper, Bodie, Cal.
223,825.—STEAM GENERATOR—J. B. Ward, S. F.
223,828.—KITCHEN TABLE—W. H. Wiester, S. F.
223,829.—COAL OIL STOVE—W. H. Wiester, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Petsnt Agency, ths following are worthy of special mention:

STRAW-BURNING BOILER FURNACE.—Harry K. Dey, Sen Jose, Cal.[1] Patented Jan. 6th, 1880. No. 223,279. This invention relates to certain improvements in the construction of furnacss for steam boilers, and is especially applicabls to that class of furnaces using straw as a fnel. It consists in the employment of a continuous horizontal and vertical grate, and, in combination therewith, of a horizontal plats at the rear end of the horizontal grate, by which the draft through the esh pit is prsvented from passing through the rear portion of ths grate to strike the flues directly, and is directed through the front part only. By this construction straw may bs burned in a fire-box boiler with good results. The straw, hsing fed into the furnace and ignited will bs consumed, and the oxygsn for its consumption is admitted only from the front, so that it must pass through the fuel and bscome heated before it reaches the combustion chember and flues. The verticel grats prevents the burned straw and cinders from heing carried against the tubes to clog them.

PNEUMATIC SAFETY CLUTCH FOR ELEVATORS. B. E. Henriksen, Thurlow block, corner Sntter and Kearny strsets, S. F. Patented Jen. 6, 1880. No. 223,287. This invention relates to certain improvements in elsvators and hoists of any description, such as ars employed to convey goods end passengers; and its object ie to eecure the cages or platforme of snch elevators or hoists against eudden fells, which are usually caused by the breaking of the cable or hoisting machinery. It consists in the employment of a pneumatio fan or plate in connection with the elevator platform or cage, and suitable mechanical devicee, whereby any unusual speed of the descending cage or platform will cause these devices to be actuated by the resistance of the atmosphere, and thus check or stop the speed of the platform.

ORE CRUSHER.—Pierre C. Du Bois, Copper City, Cal. Patented Jan. 6, 1880. No. 223,281. This device relates to certain improvements in that class of crushing apparatus in which the rock is broken by means of two jaws placed opposite to each other, one of which jaws is made to alternately approach to and recede from the other stationery jaw. It consiste in the novel combination of a breaking, grinding and sizing mechanism, in which the rock, ore or other material ie broken and pnlverizsd to any degree of fineness. This ie effected hy a peculiar arrangement and operation of a movable jaw with relation to an oppositely placed stationary jaw, and in certein mechanism by which thie jaw is operated.

WINDMILL.—John F. Barker, S. F. Patented Jan. 6, 1880. No. 223,308. The improvements consist in providing a frame which rotates in a horizontal plane, and which cerries on its arms a series of pivoted fans so arranged as to automatically present their edgee or faces to the wind during the revolution of the wheel, so that the wind-pressure will be exerted on one eide of the wheel, in combination with braces, rests and levers, whereby the action of the fans is automatically regulated.

OUR AGENTS.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. Tharp—San Francisco.
B. W. Crowell—California.
A. C. Knox—Pacific Coast.
G. W. McGrew.—Santa Clara county.
J. B. Bachalder.—Shasta County, Cal.
James Rogers—Oregon and Washington Ter.
Thos. H. Manning—Nevada, Idaho and Montana Ter.
Capt. W. H. Seamens—Arizona.
M. P. Owen—Santa Cruz County.
H. E. Hallett—Los Angeles County.
Perley P. Kilbourne—Sacramento County.
M. B. Starr—Contra Costa county.
F. M. Vanden—Alameda Co., Cal.
C. A. McMahon—Butte Co., Cal.
W. B. Turner—California.
J. W. A. Wright—Merced, Tulare, Kern and Fresno counties.

Every new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write persoually to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

Lakeport, Lake Co., Cal., Nov. 2d, 1878.

Messrs. Dewey & Co.—*Gentlemen:*—I hereby acknowledge receipt of patent, for which please accept my sincere thanks. When I have any further business in this line I shall certainly employ you. With kind regards, I am, Yours very truly, Chas. Slatterback.

Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Bound Volumes of the Press.—We have a few sets of the back files of the Mining and Scientific Press which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

Sample Copies.—Occasionally we send copies of this paper to persone who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

Extra Copies can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew Jackson's Best Sweet Navy Tobacco

METALS.

[WHOLESALE.]

Wednesday M., February 4, 1880.

Iron.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 5½
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 8
Norway, according to thickness	8½@ 9½
Steel.—	
English Cast, lb	18 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
Copper.—	
Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tioned 11x48	— @ 42
Nails	— @— —
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
Lead.—	
Pig	5½@— 6
Bar	— @— 8
Pipe	— @— 8
Pipe, Soft	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 2 10
Buck, " "	— @ 2 30
Chilled " "	— @ 2 50
Tin Plates.—	
10x14 I O Charcoal	10½@ 11½
10x14 I C Coke	10 @ 10½
Banca Tin	— @— —
Australian	24 @ 25
I. C. Charcoal, Roofing 14x20	10 50 @11 00
" " " 20x28	21 50 @22 00
Zinc.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	10½@— 11
Nails.—	
Assorted sizes	3 50@4 50

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Butte Hydraulic Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Poireon	13	2½	$25 00
L Lapierre	22	2½	25 00
H Marcoux	24	2½	25 00
J B Luesier	25	2½	25 00
John Britt	26	2½	25 00
Geo W Deitzler	37	5	50 00
N Desautelle	41	2½	25 00
Jos Lucier	42	2½	25 00
N Goldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervais	45	10	100 00
Geo Moreau	46	5	50 00
Geo W Deitzler	47	15	150 00
A S Hawes	17	10	100 00
J Callaudreau	4	10	100 00
A M Wilder, Trustee	1	10	100 00
A L Lengfeld	5	5	50 00
L L Dennery	6	5	50 00
W E Lutz	7	5	50 00
Geo. H. Powers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francisco California, on Monday, the 22nd day of December, 1879 at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, togother with costs of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 3, No. 220 Sansome St., San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock of the Butte Hydraulic Mining Company is postponed to the Fifth day of January, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock is postponed to the second day of February, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

San Francisco, Cal., January 3d, 1879.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock is postponed to the Sixteenth day of February, 1880.

L. L. DENNERY, Secretary.

San Francisco, February 2nd, 1880.

Cataract and Wide West Gravel Mining

Company. Principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California

Notice is hereby given that at a meeting of the Board of Directors, held on the 2nd day of February, 1880, an assessment (No. 2) of Twenty-five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 26½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 5th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 22nd day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. B. LAKE, Secretary.

Office, room 18, 26½ Kearny Street, San Francisco Cal.

Gila Silver Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Reveille Mining District, Nye County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of January, 1880, an assessment (No. 6) of twenty-five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, Safe Deposit building, 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Seventeenth day of February, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the Ninth (9th) day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. W. PARRISH, Secretary.

Office—Room 7, Safe Deposit Building, No. 328 Montgomery street, San Francisco California.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Fourteenth day of January, 1880, an assessment (No. 2) of Ten Cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. Gold coin, to the Secretary, at the office of the Company, room 1, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 11th day of March, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

A. C. TAYLOR, Secretary pro tem.

Office, 314 Bush street, San Francisco, California.

DIVIDEND NOTICE.

—OFFICE OF THE—

Black Bear Quartz Mining Company,

Room 13, Safe Deposit Building, San Francisco,

JANUARY, 27th, 1880.

A Dividend (No. 69) of FIFTY (50c) CENTS per share has been declared on the Capital Stock of the BLACK BEAR QUARTZ Mining Company, payable immediately.

WM. LETTS OLIVER,

Secretary.

STOCK DIVIDEND.

At a special meeting of the stockholders of the

SOLID SILVER

Gold and Silver Mining Company,

Held on the 30th day of January, 1880, at their office, No. 320 Sansome street, San Francisco, California, a

Stock Dividend of 10 Per Cent.

Was declared, payable on and after the 15th day of February, 1880.

R. HEWSON, Secretary.

ANNUAL MEETING.

The Annual Meeting of the stockholders of the GLOBE CONSOLIDATED MINING COMPANY will be held at the office of the Company, room 2, No. 106 Leidesdorff street, San Francisco, California, on THURSDAY, the 5th day of February, 1880, at the hour of 12 M, for the election of a Board of Directors to serve the ensuing year and the transaction of such other business as may properly come before said meeting.

O. H. BOOART, Secretary.

Amusements.

BALDWIN'S THEATER.

Thomas Maguire.....Manager.
Chas H. Goodwin.....Treasurer.
J. P. Chapman.....Assistant Treasurer.

CLARA MORRIS.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

Chas. E. Locke.....Lessee and Manager

MELVILLE OPERA COMPANY.

Open every evening and Saturday Matinee.

FOR SALE, CHEAP.

Second-hand Varney Rock Breaker, large size. J. W. Riley, 56 Bluxome St., San Francisco.

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Engine Company.

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Also on hand and for sale A FULL LINE OF MILL AND MINING SUPPLIES.

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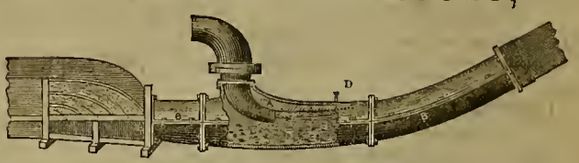

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Sluices gravel and water up hill on an angle of 45°, and will run any kind of gravel that will run in a flume. Handles rocks as easy as fine dirt, and will raise as much material as the water will carry off in a flume on 6 inches grade to 12 feet.

No bedrock cuts, tunnels or drains required. Machine a sufficient drain itself, and the process of mining the same as any other hydraulic mine. Is now a practical success in various places in California and Oregon. Send for descriptive circular to

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No. 51 Fremont Street, Office of the Hydraulic Gravel Elevating Mining Co., S. F

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Our U. S. and Foreign Patent Agency presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library containing official American and foreign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the Mining and Scientific Press. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free. DEWEY & CO., Patent Agents.

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SOUTH PACIFIC COAST R. R.

(NARROW GAUGE)

COMMENCING MONDAY, DECEMBER 1st, 1879. Boats and Trains will leave San Francisco daily, from Ferry Landing, foot of Market street, at 5:30 A. M., 9:00 A. M and 4:00 P. M., for ALAMEDA, SAN JOSE, LOS GATOS, WRIGHT'S, and all way stations.

Stages connect with 9:00 A. M. train at Wright's for Hotel de Redwoods, Soquel and Santa Cruz.

Ferries and Local Trains Daily.

From San Francisco—5:30, †6:40, †7:45, 9:00, 10:30 A. M 12:00 M., 1:30, 4:00, 5:15, 6:30, 8:30 P. M.

From High Street, Alameda—†5:40, †6:45, 7:50, 9:07, 10:35 A. M., 12:05, 2:40, 4:05, 5:23, 6:35, 9:35 P. M.

†Daily. Sundays excepted.

☞SECOND-CLASS FARE TO SAN JOSE, $1, on train leaving San Francisco at 5:30 A. M. daily (except Sundays.)

A TRAIN will leave San Francisco on Sundays at 5:30 A. M.; the 7:45 Sunday train having been discontinued.

THOS. CARTER, Superintendent. G. H. WAGGONER, Gen'l Pass'gr Ag't.

New Book on the Comstock.

The attention of MINING ENGINEERS and EXPERTS is called to the new work by John A. Church, E. M. Ph. D., on "The Comstock Lode, Its Formation and History." This very exhaustive treatise on this famous lode is fully illustrated with diagrams and colored charts showing sections, ore bodies, etc., and will be of great interest and permanent value for reference. Dewey & Co., Publishers of the Mining and Scientific Press, are sole agents for the sale of the work Mr. E. M. Sleator will act as their agent, and call on Mining Engineers and those interested in the great lode in this city with a copy of the book for their inspection.

Laura De F. Gordon, Attorney-at-Law, room 29, Montgomery Block, San Francisco.

Miners, write for your paper.

Kendall's Spavin Cure

Is a sure cure for spavin, splint, curb, callous, sprains, swellings, galls, lameness and all enlargements of the joints or limbs. It will completely remove a bone spavin without blistering or causing a sore. It is also as good for man as for beast, and is used full strength at all times of the year with perfect safety. A cure which we are knowing to is a person who suffered 15 years with hip-joint lameness and was permanently cured two years ago with Kendall's Spavin Cure. Remember we claim it will cure a bone spavin and completely remove the bunch without blistering.

Office U. S. Marshal, Western Dist. of Michigan, Kalamazoo, April 15th, 1879.

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Send for illustrated circular giving positive proof. Price, $1. All Druggists have it or can get it for you.

Dr. B. J. Kendall & Co., Prop's, Enosburgh Falls, Vt.

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Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pips, Oil or Water Tanks, Ors and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK,

Repairing promptly attended to at the lowest possible terms.

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Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

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ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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All kinds of Brass, Composition, Zinc, and Babbitt Mstal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Ruddsr Braces, Hinges, Ship and Steamhoat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connsctions of all sizes and patterns, furnished with dispatch. PRICES MODERATE.

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Vertical Engines,	Baby Hoists,	Stamps,
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Automatic Cut-off Engines,	Rock Breakers,	Settlers,
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Hoisting Engines and Works, Cages, Oro Buckets, Ors Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

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Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

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Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanks.

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Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and mads in accordance with the Act of Congress regulating ths same, or for use on land. Water Pips, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

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HYDRAULIC RIVETING. Boiler Work and Water Pipe made by this establishment, riveted by Hydraulic Riveting Machinery, that quality of work being far superior to hand work.

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Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable ratea Orders solicitedand promptly attended to.

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Kustel's Roasting of Gold and Silver Ores, and the extraction of their respective metals without quicksilver. Illustrated. 142 pages. 1870. A valuable and carefully written work. Postpaid, $2.50. Published and sold by Dewey & Co., S. F.

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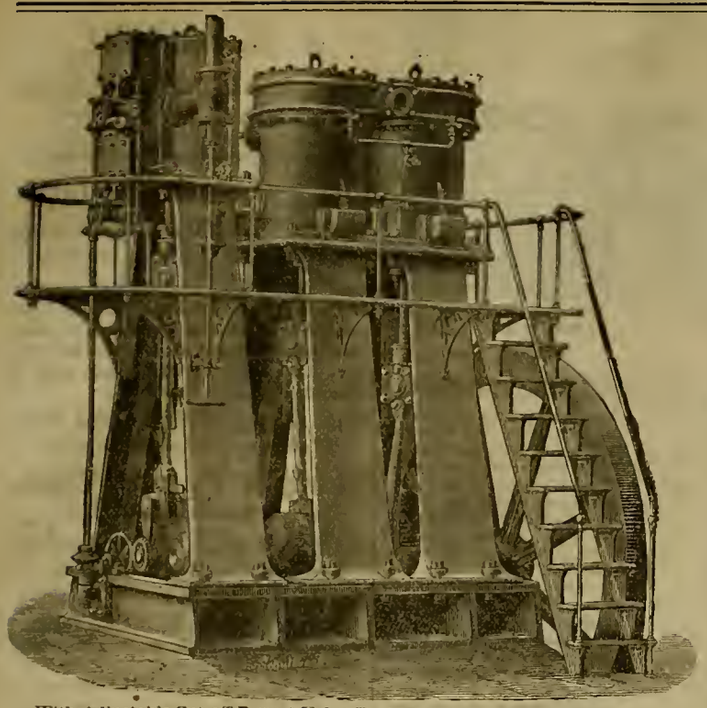

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Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

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STEAM ENGINES, BOILERS, STAMP MILLS, FRUE VANNERS
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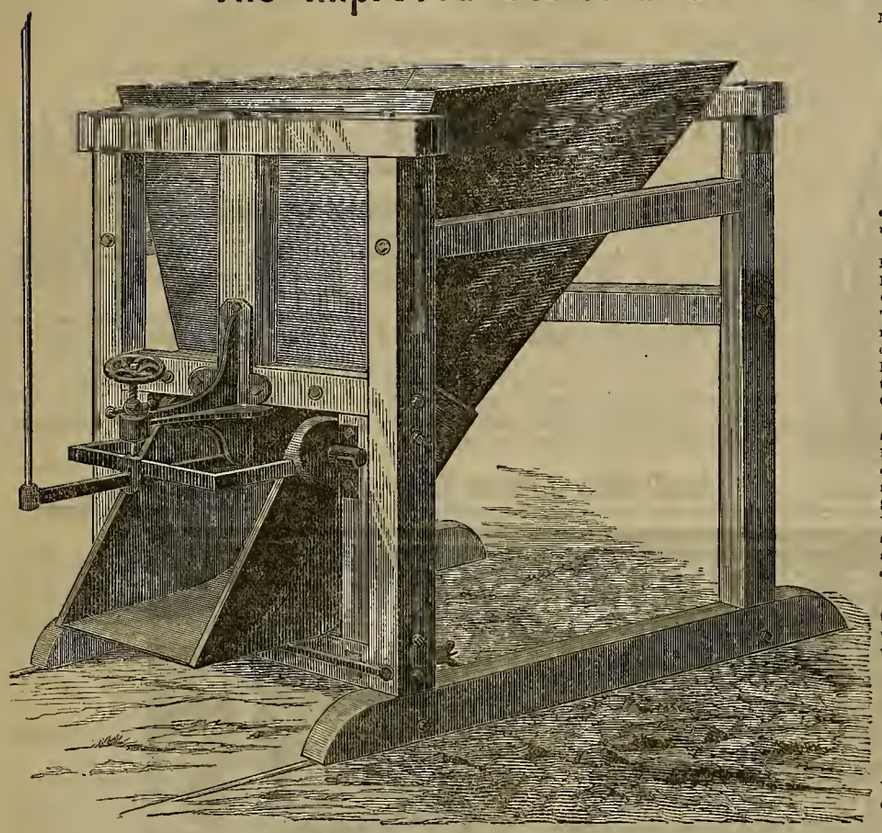

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In this connection I will state that I will give $50 to be shown up to this date one of the Eclipse Ore Feeders, manufactured by Prescott, Scott & Co., of the Union Iron Works, which is in general successful practical operation at any quartz mill on this coast.

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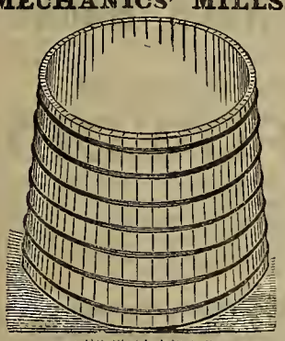

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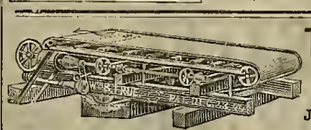

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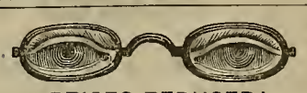

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, FEBRUARY 14, 1880.

VOLUME XL Number 7.

Electric Light.

American inventors are in the advance in discovering appliances by which electricity can be practically used for lighting, and the rapid progress made in this direction shows how indefatigable they are in such matters, and how capable they are to effect the purpose they have in view. They have ever evinced a wonderful degree of ingenuity in mechanical constructions, and their superiority has been acknowledged throughout the world by the readiness with which their inventions are adopted. It is truly said that "A prophet is not without honor, save in his own country," and the same axiom might be justly applied to new inventions.

In England and in Europe they are far ahead of our own people in applying our inventions to their own benefit. There are already three points on the English coast where the electric light is used in lighthouses. Two lighthouses are using it in France, and Russia has one at Odessa, and with all the progress already made in electric illumination, the United States have not yet placed it in any lighthouse.

In England, at Charing Cross, a 20-horse engine sustains 60 electric lights, of which 10 are at the Victoria station of the District railway, 40 on the banks of the Thames, and 10 on Waterloo bridge. There is a distance of over two and a half miles between their extreme points. The longest radius from the electric engine is a mile and a half, and this with the number of lights in proportion to the power of the engine, demonstrates that previous calculations as to the capability of this method of lighting have been greatly below what they should be.

The electric light has been recently introduced into some of the mines on this coast with very favorable results. It has given full satisfaction in one of the leading gravel claims in Nevada county, in this State. Now that a commencement has been made in its application to our mines, and also in a moderate degree in the illumination of some of our public buildings, we hope that we will soon outstrip our European brethren in putting into use this valuable light.

At the Free library in this city they are using three electric burners, which give a strong, white light sufficient to illuminate the large room, and at a cost of about one-third of the gas heretofore used, with a far greater volume of light. The cost would be still less if the charges for light were confined to the actual time it is used; the Electric Light Co. charges for the whole time that the electricity is generated. The lamps are used from about 5 P. M. to 9:30 P. M., and the company charge the library for them until 12 midnight, which is two and one-half hours in which they are not used.

Double Reel Compound Geared Hoist.

The engraving on this page represents the compound geared mining hoist, with inclined engines, and double reels for flat rope, of a type manufactured by Prescott, Scott & Co., of the Union Iron Works in this city.

It is specially designed for sinking rapidly to great depths, and for working in the pump shaft, when the permanent hoisting machinery for raising the ore has been erected.

By shifting the lower intermediate shaft, the extra gears are brought into action, and the power multiplied. In case of accident to the regular hoisting machinery, one compartment can still be utilized by attaching the rope with its cages to the extra reel of the pump hoist, until such time as the repairs are effected. The Union Works are prepared to furnish with dispatch these machines with 16-inch cylinders, 24-inch stroke, three sizes of wheels and four sizes of pinions; or 18-inch cylinders, 24-inch stroke with three sizes of wheels and four sizes of pinions. The reels are 36 and 40-inch.

ADOLPH BORIE, ex-Secretary of the Navy, died recently at Philadelphia.

Advantages of Incorporations to Mining.

In the combination of men to develop and work mines they generally act under incorporated organizations. This is done to facilitate the transfer of individual rights in the property. These rights are represented by shares of stock, which can be disposed of with the same readiness as an other personal property. It also relieves the holders from the personal responsibility which would be imposed upon them under a copartnership. The supervision and management of the mines is left to officials who are appointed by the board of directors, and there is no requirement for the individual to act in the matter.

Under a partnership, if one of the partners should be dissatisfied with the arrangement, or should wish from any other cause to cease his connection with the enterprise, he might find it impossible to do so. He might not be able to dispose of his interest, or he might not be able to accomplish a settlement of it with the remaining partners. Even if he preferred remaining in the partnership, he might be involved in pecuniary embarrassment by the action of his associates, who could against his remonstrances incur indebtedness which he might be unable to cancel. If he possessed ample means, he might be ruined by the dishonesty of one or more of the members of the firm. The responsibilities attendant upon a copartnership are numerous, and might prove to be annoying and burdensome. All these difficulties he would avoid under an incorporated action. He would be free to remain in, or to leave the concern at any time.

The chief advantage of an incorporation is that sufficient capital can be obtained for the prosecution of the full working of the mine by the aggregation of moderate sums derived from the sale of small lots of stock. This aggregation will come from the many, and the investors who are willing to place their small amounts in the enterprise, would not, and could not, advance larger amounts. If the mining interest had to depend for its vitality upon the action of individual or partnership operations, it could never have assumed the prominence which it now holds as a great national industry. It would have been confined in its efforts to a very limited channel. It would have been almost unknown, and but seldom heard of. Its present wondrous success would not have been attained. The impulse given by it to so many attendant industries would have been unfelt, and the widespread prosperity which it has conferred upon the world would never have existed.

The man who first conceived and put into operation the idea of incorporated bodies, was a public benefactor; and could his name now be known, his memory should be held in especial veneration. It is by this combined action that the industries of the world have been advanced, and are still kept in motion. There is no industry that owes so much to incorporation as does that of mining; it has been fostered and sustained by it; to it, it owes its existence; without it, its rich fruits would never have been produced.

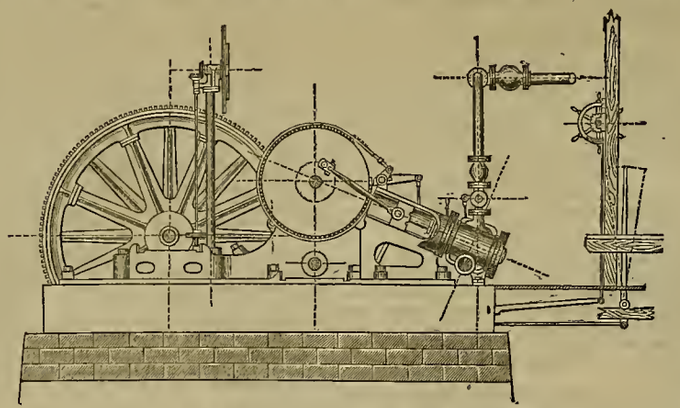
The U. S. Fish Commission on the Pacific Coast.

Prof. David Star Jordan, Assistant U. S. Fish Commissioner and in charge of the investigations into the fish and fisheries of the Pacific coast, U. S. A., the results of which will be incorporated with the census of 1880, has lately paid this city a flying visit.

Prof. Jordan is one of the best known and most accomplished ichthyologists of the United States, and a most persevering and thorough worker. He has probably done more than any other man living to increase our knowledge of the fresh-water fishes of the country, and there is no doubt that his labors upon this coast will result in the accumulation of a vast number of fresh facts, of economic as well as of scientific interest, about the habits, geographical distribution, variations and value to mankind of the as yet only imperfectly known fish-fauna of our shores.

He is accompanied by his pupil and secretary, Mr. Gilbert, a young man who has already made his mark in ichthyology.

Prof. Jordan and Mr. Gilbert commenced their work at San Diego, where the weather is more favorable for procuring specimens than it is here, and are gradually working their way up the coast to San Francisco, where they will arrive in April or May, and will probably make that city their headquarters for two months or thereabout.



DOUBLE REEL COMPOUND GEARED HOIST.

Altogether they will spend nine months upon the coast. During the two days of their visit, a considerable quantity of fishes were purchased in our markets, to be packed in ice and sent in a fresh condition to the Smithsonian Institution, where life-size casts will be taken, and colored so as to become an exact fac-simile of the living fish.

Prof. Baird, writing some time ago, stated that 600 of these casts had already been taken, and our State Fish Commissioner, Mr. B. B. Redding, who has lately paid a visit to Washington, speaks in glowing terms of their accuracy and beauty.

This is the only method by which the exact form and true coloration of a fish can be preserved for examination, as alcohol destroys or changes the colors and more or less shrivels and contracts the tissues, and a skin cannot be relied on for color or shape.

The Fish Commission desire to obtain at least 50 specimens of every species inhabiting the west coast of the United States, so as to have a series sufficiently large to show all variations due to age, sex or habitat. The greater portion of these will be preserved in alcohol for anatomical examination; but, if the first attempt to transmit fresh fishes in ice across the continent proves successful, the experiment will be repeated with examples of other species, as it is the desire of Prof. Baird to enrich the National Museum with casts of every form found in the waters of the United States.

Catalogue of the Pacific Coast Fungi.

Previous to the year 1876 nothing had been accomplished in the study of the fungi of this coast, with the exception of a few species collected by the Wilkes expedition, which were at that time referred to Professor Torrey for identification. But four or five of these were determined and of these but one or two can now be traced. Since that period, although the flowering plants have been most thoroughly studied, the fungi of this coast have been entirely neglected.

Fully realizing the importance of the undertaking, not only for its scientific value, but also from an economic standpoint, Dr. H. W. Harkness, of this city, and Justin P. Moors, of San Rafael, some four years since determined to devote their leisure to making a collection of the Pacific Coast fungi. These gentlemen have now published, under the auspices of the California Academy of Sciences, a catalogue, of which we have seen the proof-sheets. The list is the first of the kind ever published on this coast, and will be of great service, no doubt inciting many others to a study of this most interesting department of botanical research.

The authors do not claim that the catalogue contains anything like a full list of the fungi of this coast, or even of their own collection. It is merely a catalogue such as they know to be found here, and such as they have fully determined. A large mass of material still remains in their hands for study and determination, as leisure will allow. In the cave fungi, or fungi of our mines, comparatively little has been done. Want of literature on this subject has been a great hindrance to them in their work.

While they have not been able to visit every portion of the coast, a glance at the catalogue will show that their explorations have extended over quite a wide range of territory—from Mt. Shasta on the north to Fort Yuma on the south—from the seashore to the eastern limits of the Sierras.

In reference to the geographical distribution of the fungi, it is noted that most of our species found upon the low lands are common to both Europe and America, whilst of those growing along the Sierras, many are the same as the Alpine species of Europe; others are peculiar to our own coast. Again, it will be seen that the hot and arid desert at the south yields species common to Africa. The distribution, the authors have aimed to make clear by giving in every instance the locality where found. They have, in the case of the Hymenomycetes and other edible fungi, indicated the fact by appending an *E.* They have also added the habitat of our *parasitic fungi*, to aid the student, and have indicated the *new species.*

Messrs. Harkness and Moore have brought a great deal of intelligent labor to bear on their task. Both gentlemen are enthusiasts in their specialty, and the result of their work is a credit to themselves and the society under whose auspices the catalogue is published. They have followed in the first part the arrangement of the genera as given by Fries, in his Hymenomycetes Europæi. For the rest they have adopted the order, as far as practicable, as given in Cook's Hand-book.

MINING IN ARIZONA.—From a private letter from Tucson we take the following items of interest concerning mining matters in the Territory: Mining excitement is beginning to run high. Some of the most noted experts on the coast are here examining properties, among whom I notice Geo. Hearst, Taylor, Hoffman Farrish and others. Many properties are changing hands at satisfactory figures. New and rich districts are constantly coming to the front. Among the most noted of these is the district in the Dragoon mountains, where Gen. J. B. Allen is opening the Silver Cloud—a rich bonanza of chlorides—and the Empire mining district, where the celebrated prospectors, Hank Williams, Toppy Johnson and Capt. Weeks, are discovering and locating rich prospects, which will soon be developed into paying mines. This latter district is only 40 miles from Tucson, with a good road all the way. The railroad has made an advance of 12 miles towards us from Casa Grande.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Wiegand's Amalgam Refining.

A Method Simpler, Cheaper and More Complete Even Than That of Prof. Riotte.

EDITORS MINING AND SCIENTIFIC PRESS—Sirs: The highly interesting communication of Prof. E. N. Riotte, relative to the refining of copper-base and of lead-base amalgam, which communication appeared in your issue of Dec. 20, 1879, induces me to break the silence which hitherto I have kept respecting a method of reaching not only the very same results which he recites, but besides, of attaining valuable points which his method does not; for my method is simpler, more effective and far cheaper. I sincerely hope that Prof. Riotte's stoichiometric formulæ may not cause many practical millmen and mining managers to look upon his communication with a distrust which it does not merit.

History of Amalgam Refining.

So far as I have been able to learn, my own are the earliest methodic, practical investigations prosecuted on a working scale, of the now solved problem of amalgam refining, and within that field there still remains room for great discoveries, and more than one fortune to a radical investigator favored by capital willing to sink a portion of itself in working experiments.

I, myself, undertook the task at first, on the score of curiosity and friendship, but finding that experimenting was a very costly luxury which few of those who would be most aided by it would pay for, I sought to patent my discoveries and inventions that I might be able to *exact* what was *freely* accorded only by a few.

I therefore resolved to determine *what economies are possible within the doors of the producing mill*, by means of which the producers of base amalgam (the common result of heavy treatment with bluestone) might escape the prodigious discounts on the sale of bullion, which more than any single influence has ruined the enterprising men who sought to snatch from the *wastes* of our mills and mines, the millions annually sunk in our inland river beds, whose waters never reach the sea. But of course the *origin* of copper or lead in amalgam, whether from the native ore or from mill "treatment," makes no difference either as to the *necessity* for refining it cheaply, or as to the adaptation of my process to that end.

Early Producers of Copper-base Amalgam near Virginia.

I was incited thereto as early as 1866 (I think; my earliest notes thereon being destroyed by fire, I am uncertain) by the destructive discounts which overtook Louis Janin, Esq. (Canyon mill, now known as Parke's Express mill), of Virginia; and later, by Messrs. F. Birdsall & Co., of Dayton (whose works are now incorporated as those of the Lyon Mill & Mining Company), and by Messrs. Likens & Bullion and Jno. Briggs (also near Dayton), and by Messrs. Parke & Bowie, of the Railroad and Express mills of Virginia, and by the Carson Valley Mill Company, near Sutro.

The foregoing parties were then the chief producers of copper-base amalgam in this vicinity, just as Fair & Mackey (our Bonanza kings) now are. And being patrone of my assaying establishment, *their* interests became *indirect* interests of my own.

Chief Difficulty Overcome, and a Chance for Safe Investment Remaining.

Like Prof. Riotte, in my investigations I very early encountered the confueing problem of eliminating *both* lead and copper from silver amalgam. Hot mercurial leaching would readily (though with poor results) separate the lead from the silver, for the simple reason that, *as compared with silver*, lead is far more fully soluble in hot mercury than silver is; but the copper remained, at first staggering me as it had all prior students of the problem *by that resort*.

While prosecuting those investigations, besides touching facts which Prof. Riotte recites, I obtained some very valuable results relating to refining lead-base amalgam, which, when further developed, I purpose patenting. And I also obtained the *cue* to the process (patented in 1873) for separating silver by leaching it away from the amalgams of *other* metals than lead, which of course covers the separation of silver from gold, as well as from any other metal, and secures me time in which to develop that most important and interesting chapter of "parting" the precious metals mercurially.

One thing, however, became boldly plain to me as soon as I confined my attention to the problem of *either* removing the copper from the silver (as Riotte did) or of removing the silver from the copper and gold, viz: That it is on *amalgam* and *not* on melted or retorted bullion that the economy of *mechanical* refining or parting became possible.

The separation of the silver from both gold and copper in base amalgams at length I perfectly accomplish, *and in a large, cheap, working way*, just as I then did in a laboratorial *miniature* way.

A Success that Impoverished the Inventor.

In 1873 I patented my method, and then my poverty began. It took all I could earn and filch from regular business—perhaps more justly due to generous creditors—to perfect and simplify the method and apparatus to a point where Stupidity itself must see that there's "Millions in it" *for those who use it*, and small share of their savings for me.

A Plan for Cleansing Quicksilver and Amalgam from Lead.

One method of eliminating the lead from a complex mixture of amalgams, not being patentable, I see no reason for withholding; especially as it so closely resembles Prof. Riotte's, but is only cheaper.

It is chiefly valuable, however, as a step *precedent* to my own patented system of *copper*-base refining; and if any patent agent can get me a patent for it in *combination* with my process, I shall be only too glad to pay him a liberal fee. It is as follows:

The mechanical agitation or trituration of lead-fouled quicksilver or amalgam (whether copper-base or not) *with bluestone* (sulphate of copper), but *not* as Mr. Riotte commends, with *salt*, but WITHOUT salt.

Those of your readers who are not chemists will not care to see the reactions indicated by symbols; those who are do not need it—a moment's reflection must make them apparent. It is sufficient to say, that practically they cause copper to *expel* lead (as sulphate of lead), replacing the lead by copper in the amalgam (and so far as my limited experiments on this point go to show, with absolutely *no* loss of either gold, silver or mercury), giving me a very simple *form* of amalgam to operate on, viz., goldo-copper-silver amalgam only, from which, by my process patented in 1873 (or by another patented later), I can *completely* separate the silver*, leaving the gold and copper only in mixture, and in such a physical condition after retorting as to be readily oxidized atmospherically, and ready for solution in even the weakest "Chamber" sulphuric acid—indeed, that acid needing dilution with water.

The Chief Gain.

But the crowning fact in relation to my process is, that while its by-product (CELLULAR COPPER SPONGE) makes the most perfect bluestone which it is possible to produce, INCIDENTALLY it effects the *liberation of the gold in the bottom of the bluestone dissolving vats.*

This, of course, abolishes absolutely *all* discount on the gold *part* of the bullion which formerly *was* discounted on sale quite as much as the silver, and *averages* discount on the product of a mill to the very lowest point possible, so long as silver is not coinable without restriction for all owners into all the dollars it will make, as it is the *right* of all silver producers to have done for them by the Government, mono-metallic goldites in financial creed to the contrary notwithstanding.

The Cheapness of It.

When the restoration of the metallic copper to the form of bluestone† is considered as a part of one of my processes, the costs of the operation are literally LESS THAN NOTHING, for the bluestone (or to a certain extent the metallic copper) becomes a source of profit, under the terms of the licenses which we issue.

A Caution.

Do not understand me as commending the foregoing method of *lead* elimination from amalgam as the *best*, even if it is both simple and apprehensible. But in my judgment it *is* far better as a process than the mercurial leaching process once practiced (I am told) at Pioche. At a future time I hope to submit to your readers a lead-base process of greater merit than either, but until further experiments, now in course are completed and the results patented, I deem it best to maintain silence in relation thereto.

A Fair Rich Man May Get Richer Safely.

It is proper in closing this long letter, also to inform you, that you may the public—that for a long time I have been studying up and preparing a system of parting (separating) gold from silver in amalgam which is *free* from base metals of all kinds whatsoever; and that I am embarrassed and delayed in this undertaking chiefly by inability to get capital, *safe to trust.*

I greatly need funds for some costly experiments; and only with a party whom I *know* to be as simple in spirit as I am myself, and as honorable as he may be rich, and ready to sink a few thousand dollars, and still be happy in his faith in me and in my ultimate results, or else in my eventual re-payments of outlays—only with such a party am I willing to make business relations on this matter. But with such an one I am confident that I can do well, while enriching him. Do you *know* of such a rare person?

The Process in Extensive Use.

The "success" of my process, perhaps is best presumptively attested by the fact that our bonanza kings (after a very cautious trial at the Omega mill), have put it in at all their large mills when running the base method of amalgamation.

At the cost of the wages of one man and little steam for heating, 4,000 lbs. of amalgam, however base, can be perfectly stripped of its silver; and the silver got out will be coin fine, or over; and it is an important fact to know that the refining operations are not attended with any loss of either mercury or silver.

How about loss of gold?

Carelessly operated some gold may be lost; but at the Hoosier State mill, where I have the personal management of the refining, I am producing coin-fine silver from amalgam 160 fine; and I do so without *any* loss of either gold, silver, or quicksilver, while at the same time both the gold and silver produced are absolutely free from lead. Very respectfully,

CONRAD WIEGAND.

*And when the alloy is pure tough copper only (while no gold is contained), silver, coin-fine, mints (or can be minted) *exempt from all charges*, except a nominal one for melting and assaying, just as if it were 1,000 fine.

†For *nascent* subchloride of copper seems far more effective for work in an amalgamating pan than prepared Cu Cl, and the mixture of *bluestone and salt* IN THE PAN, in practice, is found to work better than when copper chloride is leached out, as indicated by Prof. Riotte, for renowned use.

The Alkalinity of Tulare Lake Water.

EDITORS PRESS:—I have received a letter from a resident in the San Joaquin valley, asking if the sample of water from Tulare which was analyzed in the University laboratory was not taken from a hole near the shore, and therefore was not representative of the body of the lake. He states that those who have gone out in boats say that the central lake has palatable water. He mentions that fine trout live in the water, water birds frequent it, and that turtles are shipped thence to San Francisco; also that in places where the lake water was driven by last winter's storms upon the grain sown along the shores, the crop was benefited rather than injured. These things he says would not be so if the water was alkaline like Owen's or Mono lake.

In the latter conclusion my correspondent is right, and, therefore, I wish to correct the impression in regard to the *degree* of alkalinity involved in my statement of the composition of the water of Tulare lake. It does not in any manner approach the alkali lakes he speaks of. It does not imply that fish, fowl and other tolerably adaptable live things cannot safely live in or on the water where it is as strong as stated. It does not even imply that crops irrigated with it may not make a healthy growth, *so long as the water is not allowed to evaporate on the ground to any great extent*, especially if the carbonates should be neutralized by gypsum, but it *does* imply, that irrigation as ordinarily practiced now, giving just as much water as is needed for the crop, and not enough, nor in such manner as to wash it through and thus relieve the soil of the accumulated salts, would in a few (in some cases in one) years render the soil both unproductive and untillable.

Now as to the suggestion in regard to the possible exceptional quality of the water analyzed, I am informed by Mr. Thomason that the sample analyzed is from no bay or inlet, but from the plain body of the lake. Its basin is not cut up by islands to any serious extent; and thus, according to the well-known laws of diffusion, and in view of the stormy season, causing as is said flood-tides on the lee shores, it is difficult to conceive how there could be any serious difference in the general body of the lake, unless at the month of Kern river, locally. I say *serious* difference, for some there would be, but unfortunately not enough to affect the general conclusion. There is but one hypothesis that could account for local alkalinity in such a body of water, and that is, the possible existence of alkaline springs. There is no reason to suppose that such exist, and in fact the reverse is the case, in view of the geological structure of the country. But still it is possible, and in view of the capital importance of the subject it should be investigated, and that at once. I have invited my correspondent to help to obtain the necessary samples of unquestionable authenticity. Not less than two gallons should be taken, in perfectly clean vessels, glass if possible; but a water keg, or a well cleansed jug will do. Ship by freight or express to me. It is no small question, and I should welcome any help to bring it to a prompt decision.

EUG. W. HILGARD.

University of Cal., Berkeley.

Smelting and Reduction Works in Utah.

Utah has the following smelting and reduction works:

Districts	Mills.	Stamps.	Furnaces.
Alta	..	..	..
Beaver	1	20	..
Bingham	3	40	..
Camp Floyd	1	20	1
Frisco	..	..	..
Honansville	1	10	..
Ophir	1	10	..
Park	3	80	4
Silver Reef	5	38	..
Stockton	1	15	..
Tintic	3	52	..
Total	19	235	5

Of smelting works proper there are in the valleys of the Cottonwood and Jordan, and two miles from the city, the following:

Name.	Stacks.
Old Telegraph Works	5
The Mingo	4
The Germania	3
C. W. Schofield & Co	2
Morgan & Pittsburg M. & M. Co	1
Total	15

Elsewhere in the Territory are the following customs smelters:

Name.	Stacks.
At Frisco, the Frisco Smelting Works	2
Godbe & Co	1
Cullen, Campbell & Co	1
At Stockton	2
At Rush Lake	2
Total	8

Of these 23 stacks probably not over one-half are now kept steadily employed. Leaching works, using Kustel's process, have been established at several points, the largest plane being used by the Old Telegraph company.—*Silver Reef Miner.*

The Mines of Utah.

Ten years ago, on the 12th of January, Woodhull Bros., of Salt Lake City, shipped the first carload of ore from mines in this Territory over the Utah Central railroad. At that date Colorado had been producing ore ten years, Montana eight years, Idaho six years, New Mexico and Arizona five years, Oregon and Washington Territory six years.

Ten years have elapsed—years, for the most part, of general stagnation and depression in business in this country, in which all of the leading industrial interests of the nation have been more or less crippled. Capital, so largely needed in the equipment and development of mines, has timidly sought its hiding places and nestled in bank vaults, or been invested in Government bonds and other evidences of debt. In face of all these difficulties, supplemented by local embarrassments growing out of sensational rumors affecting the security of person and property, and by a well-founded fear of hostile legislation on the part of the dominant religio-political party of the Territory, the mining industry has struggled to the front, and Utah now stands fourth on the list of mineral States and Territories in the Union. Within the short period of ten years this great interest has leaped from helpless infancy to lusty manhood. Its aggregate production amounts to nearly $47,000,000, with an annual average yield of $4,700,000, or nearly 10% on an investment of $50,000,000.

Taking the last named sum as a fair estimate of capital and labor actually invested in Utah mines, mills, smelters, and all the appliances and adjuncts of mining—and we think it will fully cover all expenditures—how stands the case to-day? We place the actual value of all the mines, prospects, mills, smelters, sampling works, machinery, tramways, etc., in Utah, at double the supposed actual investment, or $100,000,000 (and well-informed mining men will, we think, sustain us in this estimate), and capital invested here during these 10 exceptional years has doubled in value, besides paying nearly 10% per annum on its original investment. We believe the facts would show a much larger return.

These are the direct results; it is more difficult to sum up the indirect, but equally substantial benefits, accruing to all classes and to the Territory at large through the development of our mines. In a material sense our mining industry furnishes life-blood to the body politic. Within the period we have referred to, it has lifted Utah from poverty and isolation to wealth and influence; has helped to build and largely sustain her railroads, furnishing four-fifths of their income; has erected churches, established schools, hospitals and charitable institutions; has infused into an unenterprising people elements of activity and progress, and added to the population a class of people that any community may well be proud of.

Close up the mines, silence the clangor of stamps, put out the fires of smelters, and Utah would revert to the obscurity and insignificance of a cabbage garden.—*Silver Reef Miner, Jan. 10th.*

Leadville's Ore Output.

According to the weekly circular of Uthoff, Van Zendt & Co., ore and bullion brokers, the present daily output of ore from Leadville mines is as follows:

Mines.	Tons.	Mines.	Tons.
Chrysolite	125	Iron Mine	25
Little Pittsburg	150	Smuggler	5
Little Chief	50	Tucson	5
Dunkin	15	Silver Wave	10
R. E. Lee	35	Little Ella	5
Climax	20	Highland Chief	30
Carbonate	35	Argentine	10
Yankee Doodle	5	Little Giant	15
Morning Star	40	Oro La Plata	20
Colorado Prince	5	Scooper	10
Nevada	5	Miner Boy	5
Crescent & Etna	5	Double Decker	3
Long & Derry	5	Others	35
Pendery & Glass	5		
Forsaken	20	Total tons	698
Agassiz	5		

COPPER IN ARIZONA.—To the north of Prescott, in the Black hills, there exists a section of country that contains some of the most wonderful copper ledges ever discovered in the United States, not excepting those of Lake Superior. After being mammoth in dimensions, they carry on the surface, before the richest ore is reached, ore that assays from 33% to 50% in pure metallic copper. The mine owned by Col. Biddle assays, from average ore, 47½%; while that belonging to Hugh Richards and Col. C. P. Head reaches nearly 60%, with a fair quantity of silver. Railroad communication heretofore has been remote, transportation high, rendering it almost impossible to handle any mining property which was not about all metal. But now that a remedy is coming to us, these wonderful properties are stepping to the front, and we hope soon to chronicle the sale of two or three copper mines in the near vicinity of Prescott for what they are worth, and that means millions.—*Arizona Miner.*

Mechanical Progress.

Iron in Bridge Building.

The use of iron in hridge constructiou has produced a boldness of conception in the presnt generation of engineers which casts the performances of their prsdeoessors entirely in ths shade. A half century ago such spans as ths fallen ones of the St. Charles and Tay hridges, for the loads that they wero calculated to support, wore impossible. Now thsy are far from heing of the first magnitude. There aro 10 truss bridges across the Mississippi ahove St. Louis, which are not regarded as very wondsrful structnres, and yet seven of them have spane as long as those of the Tay hridge.

The hridges at Winona, LaCroese, Dubnque, Keokuk and Hannibal, have spans of 240, that at Rock Island of 250, and that at Louisiana of 256 feet. The span which gave wsy at St. Charles was 320 feet in length, yet the same bridge hae two spans 406 feet long. Over the samo river is a truss hridge at Leavenworth, with threo spans of 340 feet, and another at Glasgow with fivo of 315 feet. Acroes the Ohio thero is a trnss hridge at Steuhenville with a span of 320 feet, one at Parkershurg of 350, one at Cincinnati with a span of 515 fest, the longest truss yet hnilt, and one at Lonisville with a span of 400 feet. The truss bridge over the Kentucky river, on the Cincinnati and Southern railroad, has three spans 375 feet in length, resting on iron piers 175 feet high. The proposed hridge over the Hudson at Poughkeepeie has five spane of 500 feet with piers 135 feet above high water.

In Europe there is a truse hridge over the Vistula at Graudenz with 12 spans of 300 fset. The truss hridge of Lessart, in France, has a span of 314 feet, and was pushed acrose from one ahutment to ths other after being put together. The hridge over the Rhine at Wesel, has four spans of 313 feet. The Kulenhurg bridge in Holland, which was the monarch truss before the constrnction of the Cincinuati hridge, has a span of 492 feet.

From these examples it would eeem that the St. Charles and Tay hridges, instead of heing risky engineering ventures, are entirely within the domain of expsrience. But, nevertheless, ths fact remains that, notwithstanding ths boldness with which the engineers of the present day meet the exactions of the locomotivo, they ars comparatively novicee in the use of iron. The first iron bridges wsre of cast-iron, and soon proved to he too lightly proportioned. The first suspension hridges were similarly defective. Does it remain to hs proved that the wrought-iron work of the past 20 years hetrays too great a confidence in the material? Were the St. Charlee and Tay disasters unaccountahle accidents, or were they fair tests of current engineering theories? These are questions which engineers would do well to discuss.—*St. Louis Globe.*

Why Does Steel Harden?—Mr. James Nasmyth opens up a very interesting question in the following letter recently published in *Engineering:* "In these days of earnest scientific investigation, it is to me a matter of surprise that no special attention has been given to one of the most vitally important subjects, namely, 'the reason why' steel hecomes hard on heing suddenly cooled down from a red heat by plunging it into cold water. On this one simple hut wonderful property of stssl depends the entire range of those mechanical arts which lie at the hasis of civilization, and hy whose exercise we are enahled to rise above the savage condition. It occurs to me that it is from the want of due consideration of the enormously important consequences that arise from this wonderful, yet simple, property of steel, that the causee of so remarkable a change as respects hardness which results on suddenly cooling it from a red-heat condition, has prevented the subject from receiving special attempts to investigate its nature. While in these daye the most powerful and active intellects are occnpied in physical investigations, in searching into the nature of those actions in matters which are ever in progress around us, so far as I am aware no one has made an attempt to enter npon this vitally important subject. It is in the hope that these remarks may chance to direct the attention of some one who may have the ahility and opportunity to enter upon the investigation to do so.

Cracking in Hardening.—In tools composed partly of iron and partly of steel, steel laid as it is called, the tendency to crack in hardening may he avoided in a great degree hy hammer-stretching, hammering the steel edge at a low temperature until it is expanded, eo that when cooled in hardening it will merely contract to a state of rest with regard to the iron parts; the same effect can he produced hy curving a piece, giving convexity to the steel side hefore hardening.

Immense Wagons.—Three immense wagons to be used in the mines of Colorado are heing made in Chicago. The hack wheels are six feet three inches in diameter and the tire is five inches wide. The wagons, including box, are nine feet high. They are each to he drawn by twenty yoke of oxen, and are capable of carrying ten tons each.

Improvements in Boiler Making. — Ws made reference a few weeks since to some improvements in boiler making, whereby ths leakags due to ths unequal expansion arising from the difference of temperature between the top and hottom of a boiler might be avoided. The remedy consisted in welding the plates in complete rings, se as to avoid the necessity of rivet joints at the bottem of the hoiler. This plan requirsd the rolling, for some boilers, of much largersheets than had hithsrno been attempted. That difficulty, however, was soon overcoms, when a second pressnted itself, in bending such lsrgs plates into the proper "sst." This work, according to the Newcastle (Eng.) *Chronicle,* entailed the expenditure of a largs amouut of additional time and labor. At length, however, tho managing engineer of the Jarrow Rolling Mills of Nswcastle couceived the idea of using vertieal "bending rolls," instead of the ordinary horizontal ones. The thought was promptly developed and a set of the new rolls erected at the Jarrow Works, which the *Chronicle* says are exceedingly eimple in arrangement and eminently successful in operation. By their use there is a large eaving of the labor and time consnmed in the ordinary course of plate bending; and what is of equally valuahlo importance, the required "set" of the plato is ohtained to a nicety, and with perfect ease. By the introduction of these improvements, those works are now onahled to construct marine boilers of extra large size; and the experiment has been completely euccessful.

Do not Burn Your Tires in Welding.—A correspondent of the *Wheelwright and Blacksmith* writes under the ahove head as followe: I would like to call the attention of carriags smiths to a great evil that many fall into when welding tires, viz.: of allowing the tire to burn on each side of the lap while taking a heat. Many smiths fail to take into consideration the fact that it is impossihle to heat a piece of iron two inches thick, especially when it is formed of two piecee of equal thickness, one placed upon the other, as quickly as one of half the thickness could he heated, and hence, having lapped their tire, the full force of the hlast is throwu upon it. As a result, the tire is put into service with a weakness at each side of the weld, caused hy being hurnt while the weld was heing hrought to the required heat. That there is not a particle of need for such carelessness every smith knows, no matter how poor a workman he may he. Give your weld a gradual heat; attend to it yourself, and not throw the responsihility upon your helper. Have a clsan lot of coal and under all a clean fire, and you will never lose a good customer hy having him discover a rotten place in hie tirs, causing it to hreak when far from a forge.

After Coal, What?—At the last meeting of the Liverpool Eginesring Society, a paper was read touching the prohahle exhaustion of coal, in which the author advocated the substitution of the tides as a producer of motion which would outrival all other sources of mechanical power. A correspondent of ths *Builder,* too, is of the same opinion. A compressed air chamher filled hy the tide at Brighton, for instance, would, he is confident, run an atmospheric railway, such as Brunel invented, from that place to London. If the tides could he thus utilized, all our railways and factories, in fact, all the work now done hy the steam engine, could he performed by them. There would, moreover, he no jerk, no steam, no smoke, no noise. Apart from the fact that the present generator of steam will in time cost more to produce than it is worth, coal has so many disadvantages that no one will regret to see the time when it will be supplanted hy another agent. When this is to he, is the question of the future.

Scotch Iron Product.—The ysar's production of pig iron, as shown hy the annual returns just issued upon the authority of the Glasgow Association of Iron Merchants and Brokers, has heen 932,000 tons, or 30,000 more than last year. There have also heen increases in the quantities consumed. In foundries and in the making of finished iron and steel it amounts to 8,000 tons, or a total of 302,000 toos as against 294,000 tons last year. In shipments, etc., the increase has been 130,000, the total heing 564,000 ae against 434,000 tons. And the stocks now held are an increase of 66,000, the weight at present in stock heing 745,000 as against 679,000. On only two former occasions have ths stocks been larger, and they were at the close of 1863 and 1864. The increase of 66,000 in etocks, though it is much larger than the trade had anticipated, would be not excessive considering the total make, and did not have much effect upon the market when the figures became known.

Corn Cobs for Fuel.—Mr. Ira A. Holly, Superintendent of the water works at Burlington, Iowa, reports that for the first 20 days of last December he ran his hoilers exclusively upon corn cobs. During that time the engines pumped 5,818,698 gallons of water 246 feet high; 81,466 pounds of corn cohs wero used during the time, or 4,073 pounds per 24 hours. The pnmps averaged about 290,934 gallons in the same length of time. In a letter from Mr. Holly, in which these particulars are given, he saye the duty "is ahout 14,700,000. Now figure that duty at the price we pay for eoft Iowa coal. It would take 3¾ pounds of coh to do the work of one ponnd of coal; duty figuring according to price, 55,600,000 pounds of water raised one foot high per 100 pounds of coal." This is a rather remarkable statement.

Scientific Progress.

Prof. Tyndall's Latest Word.

If asked whether science has solved, or is likely in our day to solvs, ths prohlem of the univsrse, I mnst shaks my head in douht. Behind and abeve and around us the real mystery of ths universe lies unsolved, and, as far as we are concerned, is incapable of solution. The prohlem of ths connection of hody and soul is as insoluhle in its modern form as it was in the prescientific ages.

There ought to bs a clear distinction made hstween science in the state of hypothesis and science iu the stats of fact.

Aud inasmuch as it is still in its hypothetical stage, the ban of exclusion ought to fall upon the theory of evolution.

After speaking of the theory of cvolntion applied to tho primitive condition of matter, as helonging to the dim twilight of conjecture, the certainty of experimental inquiry is here shut out.

Those who hold the doctrine of evolution are hy no means ignorant of the uncertainty of their data, and they only yield to it a provisional assent.

In reply to yonr question, they will frankly admit their inahility to point to any satisfactory experimsntal proof that life can he developed, save from demonstrahle antecedent life.

I share Virchow's opinion that the theory of evolution in its complste form involves the assumption that, at some period or other of the earth's history, there occurred what would he now called epontaneous generation. I agree with him that the proofe of it are still wanting. I hold with Virchow that the failures have been lamentable, that the doctrine ie utterly discredited.

Science and the Bible.

The *Christian Advocate* says, in reference to the first of ths ahove paragraphs ("That there ought to hs a clear distinction hetween science in the state of hypothesie and science in the state of fact"), that "no douht there is that distinction, and no douht, either, that forgetfulnese of this truth is the reason why so many prsmature assaulte have heen made on the teachings of revelation, in the name of science. 'Science, *in the state of fact,*' is no more antagonistic to the truths of ths Bible thau ons ray of the eolar epectrum ie inconsisteut with the other."

The Theory of Evolution.

The *Advocate* further says: "Prof. Max Muller makes the following strong point against Mr. Darwin's 'Theory of Evolution.' He insists that philology points out the real specific difference hstween man and the lower animals. It erects a harrier which has never heen passed. He says: 'I cannot follow Mr. Darwin, because I hold that this question is not to he decided in an anatomical theater only. There is, to my mind, one difficulty which Mr. Darwin has not sufficiently appreciated, and which I certainly do not feel ahle to remove. There is, hetween the whole animal kingdom on the one side, and man, even in his lowest state, on the other, a harrier which no animal has ever crossed, and that barrier is language. By no effort of the understanding, by no stretch of imagination, can I explain to myself how language could have grown out of anything which animals possess, even if we granted them millions of years for that purpose.'"

Deep-Sea Soundings.

Great difficulty is met with in taking deep-sea soundings hy ordinary methods when there are strong undercurrents, owing to the fact that the line is carried away hy the currents to such an extent that the length of line paid out affords no measure of the actual depth. Sr. Henrique de Lima has recently devised an apparatus to remedy this defect, a description of which was recently read hy that scieutist before the Lishon Academy of Sciences. The apparatus appears to have some valuable features. It is hased on the effects of atmospheric pressure, and consists of a cone of sheet copper, having for its hase a diaphragm of the same metal, which screws into the bottom of the cone eo that it may he readily removed when necessary. In this movahle hase there are six small holee, which allow the ingress of the sea to the interior of the cone; and to the center of its upper surface there is soldered a small vertical wire of pure silver, which occupies the axis of the cone.

To prepare the apparatus foruse the silver wire ie moistened with nitric acid, which results in the production of a thin film of nitrate of silver. The hase hsing screwed on, the cone if eusended by meane of a ring at its apex, and sunk by means of two separate weights or etones suspended by corde or chaine depending from three rings attached to the perimeter of the cone. To insure a vertical position to the apparatus, and to prevent it from heing easily turned from its course, a small float is attached just ahove the snspension ring at the apex of the cone. As the apparatus sinks into the sea the water penetrates into it through the orifices in the diaphragm and gradually rises in proportion as the pressure increases during the descent. The salt water acts on the thin coating of nitrate of silver on the wire, and turns it perfectly white hy the production of chloride of silver as far as immersion has taken place. By thie means it is determined to what hight the water has risen in the cons, and consequsntly what the pressurs has hesn; and from thess data ths depth to which ths instrument has descended is easily detsrmined hy simple formulæ. Ths auther sngests that hy suspsnding the lowsr weight hy means of an apparatus which would dstach it ou striking hottom, the apparatus would ascsnd to the surface of itself, thus dispensing with the nse of a line.

Anothsr dsvics has recsntly heeu hrought hefors the Geographical Sscisty of Berlin, which is net enly dssignsd for indicating the depth of watsr, hut also its currsnt-direction and temperature at any particular depth. This instrnmsnt consists of a hrass box hermstically closed, aud having attachsd to it an apparatus rssemhling a vans or ruddsr. Within this box a thermometer and a magnetic nesdle are contained, behind oach of which is placed sensitive photographio paper, and in front of each of which ie a small nitrogen vacuum tube. The box also contains a small induction coil. When the apparatne ie lowered to the required depth, the rudder causes it to take a direction psrallsl to the current there existing, and hence a definite direction with reference to ths needle within. The thermometer eoon acquiree the temperature of the water outside, and hecomes stationary. At this instant an electric current is ssnt to the box, which, hy meane of the induction ooil inside, lights up the little nitrogen tuhe, the violet light of which, photographically very intense, prints, in about three minutes, the position of the needle and the hight of the mercnry column upon the prepared paper. The current is then intermitted, the apparatus raised, the photographic traoing fixed, examined, and placed upon record.

Improved Treatment of Cotton Fiber.

The great world of industry knows hut very little of what it owes to the qniet, retired men of ecience, who spend their time, night and day, in inquiring into the hidden mysteries of nature, and in hringing them out, one hy one, to suhserve the constantly increasing wants of man. We have frequently called attention in these columns, to facts of this kind, and we now again refer to other matters of eimilar import. In our issue of ths 7th instant, reference was made to a recsnt interesting chemical discovery, wherehy most of the qualities and appearance of silk was given to ordinary flax fiher.

It is nowannounced that M. L. D. Kœcalin, of Basle, has devised a method, and that machinery has also heen invented and constructed whereby cotton fihsr mixed with a very small proportion of animal fihers—wool or silk—may have their entire hody uniformly treated hy one and the same process, so ae to enahle thsm to he dyed or printed with desirahle coloring matsrs, such as have hitherto heen applieahle to animal fihers only.

For this purposs vegetable oils, from which their glycerine has besn sliminated, arc, hy preference, employed. The cotton fihsr is stseped repeatedly in a hath of this mordant, either in the state of loose filaments, or of woven fahric, and either alone or mixed with silk. Between the several steepings, the fihers are subjected to pressure, in order to cause the mordant to penetrate intimately into the pores; and the fiher is then exposed to sufficient heat for fixing the mordant in it. After this treatment the fiher will he found to have become eo far assimilated in its nature to eilk or wool fiher, as to he susceptihle of treatment with the same coloring mattere with which these are treated. Olive oil has heen found to give the hest results in the ahove-described process. In operating with this oil, a quantity contained in a euitable vessel is treated with sulphnric acid, whereupon a dissociation of the fatty bodiee and a separation of the glycerine is effected, the latter, together with the excess of sulphuric acid, being removed hy washings hased on the different densities of the fatty hodies.

The product obtained is mixed with from three to four times its weight of water, producing a liquor which constitutes the mordant. If the cotton he in the form of a woven fahric, the steeping is effected hy means of a machine, in which the fahric, on issuing from the hath, passes hetween two pressing-cylinders, from which it again enters the bath, and then again passes hetween pressing-cylinders, and so on repeatedly, in order to insure the fiher being thoroughly impregnated with the mordant.

If the cotton he in the etate of filaments, or in hanks, a machine is employed such as is used in dyeing, in which the hanks are hung upon pegs or rollers, and cylinders, situated over the top rollers, are caussd to act upon the hanks, so as to subject them to pressure, at the same time that they impart to them the requisite movement for circulating through the hath.

Curious Acoustic Illusion.—M. Plumaudon, of the Puy de Dome observatory, has pointed out a curious acoustical illusion, which eome of those who use a pair of telephones in receiving may have observed. With a single telephone held, say, to the right ear, the transmitted voice appears to come from a distance to the right, while with a telephone held to the left ear, it seems to arise from the left of the listener. With a telephone to each ear, if one ear he less sensitive than the other, or if the telephone be held farthest from that ear, the voice shifts to the side of the other ear; and if hoth ears hear alike and hoth instruments are equally near their respective ears, the voice apparently proceeds from in front of the observer.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 23		Week Ending Jan. 29.		Week Ending Feb. 5.		Week Ending Feb. 12.	
Alpha	12	10¼	10⅝	10¼	10	9	9¾	9
Alta	5¼	4¼	4.85	4	4.60	3.90	6¼	4¼
Andes	1¼	75c	1.20	90c	1	85c	95c	85c
Alps	....	....	....	....	....	....	....	....
Argenta	1½	1¼	1¼	1.10	1.30	90c	1.30	....
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	13⅜	9	12⅜	10½	11¼	8⅜	11⅜	10½
Belmont	75c	60c	60c	40c	50c	....	50c	40c
Best & Belcher	14¼	13½	13½	11¾	12¾	9¼	10¼	9¼
Bullion	6¾	5¾	6¾	4.80	5¾	4.40	4.30	4.20
Beehtel	2	1.65	2	1½	2½	2	2.15	2
Belle Isle	1.90	1.60	1.70	1.20	1.10	75c	1.20	75c
Bodie	8¾	7	9	5	12	8¼	10¼	9¼
Benton	3¼	2.40	2.80	2.10	2¾	1.55	2.90	2¼
Bulwer	12	10	11	10¾	11	10½	10¼	9¾
Boyle	1	75c	80c	70c	1	75c	90c	70c
Black Hawk	1½	95c	1.10	95c	1¼	1.10	1¼	1
Belvidere	65c	45c	50c	40c	90c	60c	30c	35c
Bocker	2¼	1.90	2	1.35	1.40	1.10	1.20	1
Caledonia	4.40	4.05	4	3.70	4	3½	4	3.45
California	2¼	2	2.30	1.90	1.95	1.60	1.70	1.60
Challenge	9⅛	8	9	8¼	8½	6¾	8	6¼
Chollar	9	8¼	9	8¾	8¾	7	7	....
Confidence	1	85c	85c	75c	75c	60c	65c	60c
Con Imperial	4.90	4.05	4½	3.80	4.05	3.45	3.85	3.45
Con Virginia	6¾	5	5¾	5	5¾	3.40	5¼	4.40
Crown Point	30c	....	25c	....	25c	....	....	....
Con Belcher	50c	25c	60c	25c	75c	35c	75c	50c
Champion	....	....	....	....	....	....	50c	....
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	40c	35c
Daney	75c	65c	70c	30c	70c	50c	60c	55c
Day	1	85c	85c	75c	75c	60c	85c	60c
Eureka Con	16¼	15¾	17	16	16¼	16	16¼	....
Exchequer	4.20	3.35	3.70	3	3.15	2.65	3.65	2.60
Endowment	60c	45c	40c	30c	40c	....	40c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1.55	1.40	1.70	1.55	1¾	1.30	1.35	1.30
Gila	15c	10c	10c	5c	10c	5c	5c	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	10¼	....	10¾	10	10¼	....	15	14
Goodshaw	40c	....	40c	35c	45c	35c	45c	30c
Gould & Curry	8¼	6¼	6¾	5¾	5¾	4½	6	5¼
Hale & Norcross	8¾	8¾	8¾	7¾	7¾	5¾	6¾	5¾
Hillside	1¾	....	1.65	1¼	1½	1.45	1	60c
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	90c	75c	90c	....	1	90c	1	90c
Julia	3¼	2.55	2.30	2	2.30	1.80	2.05	1¼
Justice	3.40	2¾	2.30	2	2¼	2	2.40	1.65
Jackson	....	....	....	....	....	....	3	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	4	....	....	....
Kentuck	4.20	3.90	4	3¼	4	3¼	3.90	3.60
Kossuth	....	....	....	....	....	....	15c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	3¼	25c	60c	5c	55c	40c	45c	40c
Lady Wash	1.15	80c	1	75c	95c	75c	1.05	80c
Leopard	30c	15c	25c	25c	35c	25c	20c	15c
Leviathan	50c	40c	35c	15c	30c	25c	35c	30c
Leeds	75c	50c	50c	40c	40c	35c	40c	35c
Lee	....	....	....	....	....	....	35c	....
May Belle	40c	20c	25c	20c	25c	20c	30c	25c
Modoc	....	....	....	....	....	....	35c	....
Manhattan	1.90	1¼	1¾	1¼	1.60	1	1.70	1.60
Martin White	1.40	1¼	1.10	1	1	60c	1	80c
McClinton	75c	65c	65c	50c	65c	50c	60c	40c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	19¾	17¼	19¾	18¼	18¾	14¾	17¼	14¾
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	75c	45c	50c	35c	45c	35c	50c	40c
Northern Belle	9¾	9	10⅜	9¼	12¾	10⅜	16¾	13¾
New Coso	....	....	....	....	....	....	....	....
Navajo	40c	35c	40c	35c	35c	30c	40c	30c
Occidental	2	1¾	1.30	1	1¾	1¼	1¼	1¼
Ophir	20	17¾	19¼	18¾	18¾	16	17¾	16
Oriental	90c	70c	55c	50c	65c	55c	50c	30c
Overman	10	8¾	8⅞	7¾	7¾	6	7¾	6¾
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	....	....	....	....	....	....	....	....
Potosi	5¼	4.90	5¼	4.90	5	4	4.65	4.10
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1	80c	1	80c	85c	75c	85c	70c
Richer	....	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	8	7¾	7¾	6¾	7¾	5¾	6¾	5¾
Seg Belcher	25	21	21	19	22	21½	16	....
Sierra Nevada	24	20¾	23	21¼	22¾	18	25	20¾
Silver Hill	2	95c	90c	80c	1.05	55c	1.15	1¼
Silver King	7¼	6¾	7	6¾	6¾	6¼	7	....
Silver Prize	....	....	....	....	....	....	....	....
Sucoor	....	....	....	....	....	....	....	....
Summit	1.40	1	1.20	1	1.20	1	1.20	....
Scorpion	3.95	3.40	3.60	3.30	3.30	3	3.30	2.90
Solid Silver	50c	30c	50c	30c	40c	35c	40c	30c
South Bodie	25c	15c	25c	20c	70c	30c	60c	40c
South Standard	....	....	....	....	25c	....	25c	15c
Star	30c	20c	35c	30c	30c	25c	25c	15c
St. Louis	50c	15c	25c	....	10c	5c	25c	20c
Syndicate	1¾	1¼	1¾	1¼	1¼	1.01	1.70	1.60
Tioga Con	3.40	2.90	3	2.85	3	2.70	3	3
Tiptop	3¼	3¼	4	3.55	4¼	4¼	4.40	4
Trojan	10c	5c	30c	25c	30c	25c	30c	25c
Union Con	47	44	49	42¼	43¾	36¼	37¼	33
Utah	17¾	12¾	18	15¼	15¾	12	14	12¼
Vermont Con	....	....	....	....	....	....	....	....
Ward	2.85	2.40	2¼	1.60	1.90	1.60	1.60	....
Wells-Fargo	15c	10c	15c	10c	15c	10c	10c	6c
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	13¾	10⅞	12⅜	11	11⅜	9	10	9

Sales at S. F. Stock Exchange.

Friday A. M., Feb. 6.

410 Andes.....95c@
525 Alta.....5¼
650 Belcher.....10¼@10⅜
240 Bullion.....4.65@4.70
15 Best & Belcher..10¾@10¼
830 Benton.....2½@2.40
615 California.....3¼@3.45
615 Con Imperial....65c@60c
475 Crown Point....4.60@4
1305 Con Virginia.....3.45
250 Chollar.....7¼@7¾
330 Challenge.....1.70
385 Caledonia.....1.15@1.10
550 Colorado.....2.20@2.10
900 Daney.....40c
55 Exchequer.....3.10@3.20
300 Fairfax.....70c
700 Flowery.....25c
80 Golden Gate.....2.60
245 Could & Curry....5¾@6
150 Hale & Nor.....6¼@6½
165 Justice.....2.30@2.40
95 Julia.....2
50 Kentuck.....3.60
300 Kossuth.....15c
400 Lady Wash.....1.05@1
500 L Bryan.....40c
100 Leviathan.....35c
950 Mackey.....20c
420 Mexican.....17¾
450 N Bonanza.....55c@60c
730 New York.....50c
20 Occidental.....1¼
280 Overman.....7¼@7¾
160 Ophir.....16¾@17
225 Potosi.....4.65@4.60
50 Savage.....6¾
720 Silver Hill.....1.65@1¾
450 Solid Silver.....40c@35c
100 St Louis.....20c
160 Sierra Nevada.....21¼
415 Union Con.....36¼@36¾
800 Wells-Fargo.....1¾

20 Ward.....1.60
150 Yellow Jacket.....9¾@9¼

AFTERNOON SESSION.

650 Altas.....15c
Andenda.....60@55c
Argenta.....1.05@1
500 Alpha.....9¼
Albion.....25c
Belle Isle.....80@75c
Bodie.....10¼@10¼
Bechtel.....2.15@2.10
Black Hawk.....90c
Belvidere.....1.10
Booker.....70@65c
Caledonia (B H).....3
Caledonia (B H).....3
Day.....55c
Exchequer.....3.15
Endowment.....40c
Gould & Curry....4.85@4¾
Golden Gate.....2.55
Hale & Nor.....6¼@6⅜
Justice.....1.90
Julia.....1.80@1¾
Kentuck.....3.50
Kossuth.....15c
Leviathan.....35@30c
Mexican.....17¾
Mackey.....15c
Navajo.....40@55c
New York.....40@45c
Ophir.....16¾@16⅞
O Gold Hill.....35c
Overman.....7¼@7⅜
Ophir.....17
Potosi.....4.70
Savage.....3¼
Scorpion.....3¼
Silver Hill.....1.40@1.35
Sierra Nevada.....22¼@22
Union Con.....36¼@37
Ward.....2.30

710 S Bulwer.....1.90@1.95
440 Star.....25c
300 S Standard.....20c
100 S Bodie.....40c
100 Summit.....1.20@1.15
100 Syndicate.....1.70
235 Tioga Con.....3.15
175 Tiptop.....4
100 University.....25c
200 Vortex.....15c
130 Wales.....3

Saturday A. M., Feb. 7.

1020 Argenta.....1.20@1.30
495 Alta.....4.40@4¼
300 Andes.....95c
50 Alpha.....9¼
800 Addenda.....55@60c
200 Albion.....25c
35 Bodie.....10¼
165 Bechtel.....2
1000 Belcher.....11¼@11½
145 Bullion.....4¼
110 Best & Belcher.....10¼
80 Belle Isle.....85c
625 Benton.....2¼@2.35
500 Boston.....1.35@1.40
50 Black Hawk.....90c
100 Booker.....70@80c
350 Belvidere.....1.10@1
125 Bulwer.....10¼
880 Con Virginia..3.60@3.55
145 Chollar.....7¼
270 California.....3.55@3.60
100 Con Imperial.....60c
155 Challenge.....1.70
140 C Pacific.....4
50 Caledonia.....1.15
2253 Crown Point.....4.60@4
460 Con Dorado.....2.05
400 Champion.....60c
410 Caledonia (B H).....3
270 Dudley.....55@50c
1150 Daney.....40@35c
100 Day.....55@60c
125 Exchequer.....3
150 Endowment.....40c
550 E M Diablo.....1.90
100 Fairfax.....70c
610 Gould & Curry....5¼@5
500 Grand Prize.....1.35
200 Giant & C A.....5@4
165 Goodshaw.....40c
235 H & Norcross.....6¾@6¼
200 Hillside.....4
100 Independence.....90c
200 Julia.....2@1.95
200 Jupiter.....1¼
200 Justice.....2.20@2.10
25 Kentuck.....3¼
400 Leviathan.....35@30c
300 Leopard.....15c
432 L Wash.....90c
200 Lady Bryan.....40c
100 Leeds.....40c
320 Mexican.....17¼@17¾
200 Mammoth.....3
100 Mackey.....20@15c
115 Mt Diablo.....20
50 Mt Potosi.....1.85
210 Metallic.....1¼@1.45
310 Manhattan.....1.65
265 May Belle.....25c
195 Mono.....9¼@8¾
275 Northern Belle..13¾@12¾
250 N Bonanza.....55@60c
200 New York.....50c
200 Noonday.....4
100 Orient.....30c
90 Ophir.....17@17¼
1675 Oriental.....50c
780 Oro.....65@70c
125 Overman.....7¼@7¾
310 Potosi.....4.30
1305 Queen Bee.....30c
220 Raymond & E....75@65c
150 Real del Monte..1¾@1.40
668 S Bulwer.....1¼@1.60
150 Silver Hill.....1.45
50 Solid Silver.....30c
600 St Louis.....25c
100 S Noonday.....1.35
100 Scorpion.....3.35
335 Sierra Nevada.....23¼@24
250 S Standard.....20@25c
850 South Bodie.....40c
315 Savage.....6¾@6
250 Summit.....1.10@1.15
220 Syndicate.....1.70@1.65
100 Tioga.....3.15
190 Tiptop.....4@4.15
95 Union Con.....37¼@36¾
265 Utah.....13¾@14
200 University.....25c
15 Ward.....1.60
550 Wells-Fargo.....10c
130 Yellow Jacket.....10

Monday A. M., Feb. 9.

240 Alta.....4.30
200 Andes.....90c
200 Bullion.....4¼@4.80
815 Belcher.....11¼@11¾
10 Best & Belcher.....10¼
275 Benton.....2.30@2.35
800 Con Imperial.....60c
790 Con Virginia.....3.85
1340 Chollar.....8¼@7¾
635 Crown Point.....4.35
170 O Dorado.....2.05
865 California.....3.85@4
205 Caledonia.....1.10@1.20
20 Essex.....2
255 Exchequer.....3.05
355 Flowery.....20@10c
300 Fairfax.....80c
350 Golden Gate.....2.55@2¾
180 Gould & Curry.....5¼
305 Hale & Nor.....6¼@6¾
130 Julia.....2.05@2
430 Justice.....2.10@2
500 Kossuth.....15c
25 Lady Wash.....90c
150 Lady Bryan.....45@40c
200 Leviathan.....30c@35c
570 Mexican.....15¾@17¼
50 Mackey.....20c
110 New York.....40@45c
80 N Bonanza.....60@55c
100 Overman.....7¼@7¾
100 Ophir.....17¼
93 Potosi.....4¼@4.45
100 Solid Silver.....35c
50 Scorpion.....3.30
50 St Louis.....25c
220 Silver Hill.....1.30@1.40
155 Savage.....6¼@6¾
490 Sierra Nevada.....22@22¾
410 Trojan.....30c@25c
285 Union Con.....35¾@36
120 Yellow Jacket.....10

AFTERNOON SESSION.

750 Altas.....15c
620 Andenda.....60@55c
200 Albion.....2pc
950 Argenta.....1.15@1¼
100 Belmont.....40c
300 Boston.....1.40@1½
200 Belle Isle.....85c
600 Black Hawk.....90@70c
575 Bodie.....10
215 Beehtel.....2
150 Booker.....80c
640 Belvidere.....1¼@1.10
100 Bulwer.....10
2050 Champion.....55@60c
100 C Pacific.....4
100 Caledonia(BH).....3¼
150 Concordia.....50c
300 Dudley.....60@55c
450 Daney.....60@55c
150 D Standard.....40c
920 E M Diablo.....1.90@2
550 Goodshaw.....45@40c
100 Hillside.....1
50 Independence.....85c
270 Jupiter.....1¼@1.10
170 Leeds.....40@35c
100 M White.....90c
10 Mt Diablo.....20
210 Mammoth.....2.35

300 May Belle.....25c
600 Metallic.....1.30@1¼
400 McClinton.....50@55c
310 Mt Potosi.....2@2.35
100 Mexican.....35c
325 Navajo.....35@40c
400 N Belle Is.....20@25c
100 Noonday.....4
100 Northern Belle.....14¾
150 Oro.....90@80c
1530 Oriental.....50c
400 Orient.....35@40c
325 Queen Bee.....30@25c
750 Real del Monte.....1¼
1650 S Bodie.....50@55c
1950 S Bulwer.....1¼@1.40
400 South Standard.....15c
500 Star.....15@20c
295 Syndicate.....1.70@1.65
100 S Noonday.....1.80
100 Summit.....1.20@1.15
580 Tioga Con.....3.15@3¼
300 Tiptop.....4.40@4.30
50 University.....25c
300 Vortex.....20c
150 Wales.....3.10@3.05

Tuesday A. M., Feb. 10.

775 Altas.....4.30@4¼
250 Andes.....95@90c
10 Alpha.....9
260 Best & Belcher.....9¼@9¾
1060 Belcher.....10¾@11
575 Bullion.....4¼@4¾
1860 Golden Gate.....2.40@2¾
670 Gould & Curry.....5¾@5¼
1000 Grand Prize.....1.35
485 Justice.....2@2.10
40 Kentuck.....3¼
100 Leviathan.....30c
410 Lady Wash.....1¼
50 Mackey.....20c
100 N Bonanza.....60c
590 New York.....45@40c
115 Ophir.....16¾
50 Occidental.....1¼
5 Overman.....7¼
620 Potosi.....4¼@4.40
70 Savage.....5¼
300 Solid Silver.....30c
150 Sierra Nevada.....20¼@21
50 Silver Hill.....1.40
10 Seg Belcher.....18
1030 Scorpion.....3.10@2.90
100 Utah.....13@12¾
770 Union Con.....33@33¼
50 Wells-Fargo.....5c
375 Yellow Jacket.....9@9¼

AFTERNOON SESSION.

80 Argenta.....1.10
400 Albion.....25c
400 Addenda.....55@60c
100 Atlas.....10c
50 Belmont.....40c
50 Belle Isle.....85c
15 Bodie.....9¼@10
515 Boston.....1¼@1.40
285 Beehtel.....2
65 Black Hawk.....85@70c
150 Booker.....70c
160 Belvidere.....1¼@1.10
950 Champion.....60@55c
75 C Pacific.....4
30 Caledonia (B H).....3¼
600 Day.....55c
200 Dudley.....50c
20 Eureka Con.....16¼
150 Endowment.....40c
1130 E M Diablo.....2@1.90
715 Grand Prize.....1.35@1.30
100 Goodshaw.....45@40c
100 Golden Terra.....15
48 Independence.....95c
285 Jackson.....3
300 Jupiter.....1.20
400 Leopard.....20c
30 Leeds.....40c
470 Metallic.....1.30@1¼
50 Mt Diablo.....20@20¼
50 McClinton.....50c
320 Mt Potosi.....2¼
100 May Belle.....25c
100 Mammoth.....2.60@2¾
130 Manhattan.....1.90
310 Northern Belle.14¼@14½
100 Navajo.....30c
50 N Belle Is.....20c
140 Noonday.....4
100 Oriental.....50@45c
100 Orient.....35c
2125 O M & M Co.....80@75c
75 Paradise.....85c
600 Raymond & E.....80@75c
100 Real del Monte.....1.40
100 Star.....25c
250 Summit.....1.10@1.15
270 Syndicate.....1.60@1.65
1860 S Bodie.....50@60c
300 S Bulwer.....1.55
470 S Noonday.....1.80
990 S Standard.....15@20c
325 Tioga.....3¼@3.15
25 Tiptop.....4.10
1000 University.....20@25c
30 Vortex.....15c
40 Wales.....3.05

Wed'sday A.M., Feb. 11.

240 Alta.....4.30@4¼
30 Alpha.....9
325 Andes.....90@95c
140 Best & Belcher...9¾@9½
1920 Belcher.....11¼@11¾
100 Bullion.....4¼@4.85@4¾
160 Bullion.....4¼@4.80
195 California.....3.70@3.82
110 Con Virginia.....3¾@3.70
600 Chollar.....7¼@6¾
30 Caledonia.....1.05
90 Con Imperial.....65c
50 C Dorado.....1.90
50 Con Imperial.....65c
545 Exchequer.....2.80@2.70
20 Essex.....2
250 Flowery.....20@25c
300 Gould & Curry....5¾@5¾
1750 Golden Gate.....2.60@2¾
410 Hale & Nor.....6¾
180 Justice.....1.95
365 Julia.....1.80@1¾
100 Kentuck.....3.50
350 L Bryan.....45c
400 Lady Wash.....90@80c
200 Leviathan.....35@30c
240 Mexican.....17¾
100 Mackey.....15c
120 N Bonanza.....60@55c
175 New York.....40@45c
100 O Gold Hill.....35c
160 Overman.....7¼@7¾
100 Ophir.....17
50 Potosi.....4.30
390 Scorpion.....3¼
105 Savage.....6
250 Solid Silver.....35c
100 St Louis.....25c
360 Silver Hill.....1.40@1.35
790 Sierra Nevada.....22@21¾
50 Trojan.....25c
160 Union Con.....36@36¼
100 Utah.....13
450 Wells-Fargo.....10c
265 Yellow Jacket.....9@9¼

AFTERNOON SESSION.

500 Atlas.....15c
300 Addenda.....60c
230 Argenta.....1@1.05
100 Albion.....25c
700 Belle Isle.....1.10@1
100 Bechtel.....2@2.30
30 Bulwer.....10¾
100 Booker.....70c
100 Belmont.....40c
200 Black Hawk.....95c
50 Boston.....1¼
50 Belle Isle.....80c
750 Booker.....70@80c
300 Belvidere.....1¼
200 C Pacific.....4
1225 Champion.....70@75c
210 Dudley.....60@65c
550 Day.....50@60c
100 Endowment.....35c
100 Eureka Con.....17
910 E M Diablo.....1.90@1¾
150 Goodshaw.....45c
50 Golden Terra.....11
350 Gila.....5@10c
100 Hillside.....1¼
220 Independence.....90c@1
10 Jupiter.....1¼
225 Leeds.....40c
120 Leopard.....15c
400 McClinton.....60c
100 Mt Diablo.....20¼
723 Mt Potosi.....2@1¾
20 Mono.....9¼
800 May Belle.....25c
410 Mammoth.....3@2.90
320 Manhattan.....1¾@1.70
1150 Metallic.....1¼@1.55
200 Northern Belle..17¼@16¾
380 Navajo.....30c
195 Noonday.....4
1965 Oro.....50c
250 Oriental.....60@55c
200 Queen Bee.....30c
250 Raymond & Ely..75@80c
100 Real del Monte.....1.40
695 S Bodie.....35@30c
300 S Noonday.....1.90
50 S Bulwer.....1.60@1.65
50 Syndicate.....1.60
1450 S Standard.....25@20c
510 Tioga Con.....3.20
250 Tiptop.....4.30@4¼
1320 University.....25@20c
100 Vortex.....15c
145 Wales.....3

335 Union Con.....37@37¼
50 Ward.....1.65
100 Wells-Fargo.....10c
275 Yellow Jacket.....9@9¼

AFTERNOON SESSION.

1980 Argenta.....95c@1
600 Addenda.....60c
600 Atlas.....15c
700 Albion.....25c
40 Bodie.....10
150 Bechtel.....2@2.30
25 Bulwer.....10¾
100 Belmont.....50c
200 Black Hawk.....95c
50 Boston.....1¼
50 Belle Isle.....80c
700 Champion.....50c
300 Belvidere.....1¼
200 C Pacific.....4
1225 Champion.....70@75c
210 Dudley.....60@65c
460 E M Diablo.....2¼@2
100 Endowment.....35c
175 Endowment.....35c
600 Glynn Dale.....20@25c
150 Golden Terra.....14
370 Giant & C A.....5¼
350 Goodshaw.....40c
125 Hillside.....1
200 Independence.....1
100 Jupiter.....1¼@1.10
100 Manhattan.....1¾
200 Metallic.....1.90@2
40 Mono.....8
300 Mammoth.....2¼
723 Mt Potosi.....2@1¾
230 McClinton.....50c
450 Modoc.....40c
410 Mt Potosi.....3.80
30 Mt Diablo.....21
210 Northern Belle..20@25c
805 Northern Belle..17¼@16¾
380 Noonday.....4¼@4
100 N Noonday.....3
340 Orient.....30@25c
250 Oriental.....60@55c
600 Paradise.....75c
500 Queen Bee.....25@30c
600 Raymond & Ely..70@75c
260 Real Del Monte.....1.40
360 Star.....25c
50 Syndicate.....1.60@1.65
330 Syndicate.....1.60@1.55
1000 S Bodie.....50@55c
250 Summit.....1.05@1
100 Silver King.....7¼
100 S Noonday.....1.70
200 Tiptop.....4
195 Tioga Con.....3@2.95
400 University.....20@25c
335 Wales.....3

SALES OF LAST WEEK AND THIS COMPARED

Thurs'y A. M., Feb. 5.

10 Alpha.....9
550 Alta.....4.40@4.50
330 Andes.....85c
195 Best & Belcher.....10@9¾
1070 Belcher.....9¾@9¾
105 Bullion.....4.40
710 Benton.....2¼@2.30
210 California.....3.60
395 Crown Point....4¼@4.40
780 Chollar.....6¼@6¾
200 Con Imperial.....60c
60 Confidence.....7
310 Caledonia.....1.20@1.15
155 Challenge.....1.65@1.70
1230 C Dorado.....1.90@1¾
550 Daney.....35c
370 Exchequer.....2¼@2.35
50 Essex.....2
550 Flowery.....20c
750 Fairfax.....75c
120 Gould & Curry.....5¼
150 Golden Gate.....2.55@2¾
300 Hale & Nor.....6¾@6⅝
615 Justice.....1.90@1.95
415 Julia.....1.70@1¾
350 Kossuth.....15c
300 Lady Bryan.....40@45c
200 Lady Wash.....80c
50 Leviathan.....30c
65 Mexican.....16@15¾
100 Mackey.....15c
275 New York.....45@40c
450 N Bonanza.....55@60c
60 Ophir.....16¾
120 Overman.....6¾
20 Occidental.....1.40
460 Potosi.....4.20@4.10
100 Phil Sheridan.....20c
50 Savage.....5¾
1080 Silver Hill.....1.30@1¼
65 Scorpion.....3.10@3.15
200 Solid Silver.....30@35c
500 S Utah.....15c
435 Sierra Nevada...21¼@21¾
70 Utah.....12¼@12¾

Thursday A.M., Feb. 12.

20 Alpha.....9
550 Alta.....4¼@4.30
200 Andes.....85c
370 B & Belcher.....9¼@9¾
600 Belcher.....11¼@11¾
350 Bullion.....4.40@4.30
450 Benton.....2¼@2.30
210 California.....3.60
395 Crown Point....4¼@4.40
780 Chollar.....6¼@6¾
200 Con Imperial.....60c
310 Confidence.....7
310 Caledonia.....1@1.05
155 Challenge.....1.65@1.70
1230 C Dorado.....1.90@1¾
550 Daney.....35c
370 Exchequer.....2¼@2.35
50 Essex.....2
550 Flowery.....20c
750 Fairfax.....75c
120 Gould & Curry.....5¼
950 Golden Gate.....2.55@2¾
300 Hale & Nor.....6¾@6⅝
615 Justice.....1.90@1.95
360 Julia.....1.70@1¾
350 Kossuth.....15c
300 Lady Bryan.....40@45c
200 Lady Wash.....80c
50 Leviathan.....30c
65 Mexican.....16@15¾
100 Mackey.....15c
275 New York.....45@40c
450 N Bonanza.....55@60c
60 Ophir.....16¾
120 Overman.....6¾
20 Occidental.....1.40
460 Potosi.....4.20@4.10
100 Phil Sheridan.....20c
50 Savage.....5¾
1080 Silver Hill.....1.30@1¼
65 Scorpion.....3.10@3.15
200 Solid Silver.....30@35c
500 S Utah.....15c
435 Sierra Nevada...21¼@21¾
70 Utah.....12¼@12¾

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	13	25	Dec 18	Jan 23	Feb 16	B Burris	Nevada Block
Belcher S M Co	Nevada	21	1 00	Jan 29	Mar 3	Mar 25	J Crockett	203 Bush st
Belle Isle M Co	Nevada	1	30	Jan 27	Mar 3	Mar 25	E M Hall	327 Pine st
Belvidere M Co	California	5	25	Dec 18	Jan 27	Feb 21	C V D Hubbard	203 Bush st
Best & Belcher M Co	Nevada	21	1 00	Jan 29	Mar 4	Mar 24	W Willis	309 Montgomery st
Bodie Tunnel & M Co	California	4	20	Feb 3	Mar 21	Apr 28	A F Main	309 California st
Booker Con G M Co	California	4	20	Dec 30	Feb 4	Feb 24	W H Leut	309 Montgomery st
Bullion M Co	Nevada	13	50	Jan 26	Feb 28	Mar 17	J M Brazell	328 Montgomery
Caledonia S M Co	Nevada	30	50	Jan 31	Mar 8	Mar 26	R Wegener	414 California st
Champion M Co	California	5	20	Dec 24	Jan 30	Feb 20	J Crockett	302 Bush st
Champion M Co	California	—	05	Jan 20	Mar 1	Apr 1	G C Hurlhut	625 Commercial st
Chollar M Co	Nevada	3	50	Feb 5	Mar 11	Mar 31	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	40	60	Jan 15	Feb 19	Mar 11	J Newlands	203 Bush st
Dudley M Co	California	7	25	Feb 4	Mar 8	Apr 5	E C Masten	309 Montgomery st
El Tesoro	California	3	25	Dec 15	Feb 28	Mar 20	W H Chickering	214 Sansome st
Europa M Co	Nevada	3	10	Dec 30	Feb 3	Mar 6	J L Fields	240 Montgomery st
Exchequer M Co	Nevada	15	50	Jan 13	Feb 17	Mar 9	C E Elliott	327 Pine st
Gila S M Co	Nevada	6	25	Jan 15	Feb 7	Mar 9	W W Parrish	328 Montgomery st
Gould & Curry S M Co	Nevada	37	1 00	Jan 6	Feb 11	Mar 4	A K Durhrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	63	1 00	Jan 14	Feb 19	Mar 11	J F Lightner	309 Montgomery st
Hillside M & M Co	Nevada	2	30	Feb 4	Mar 8	Apr 5	F F Frankenthal	330 Pine st
Independence M Co	Nevada	5	30	Jan 13	Feb 17	Mar 9	E M Hall	327 Pine st
Iowa M Co	Nevada	8	10	Jan 21	Feb 23	Mar 11	R L Thomas	411½ California st
Justice M Co	Nevada	31	50	Feb 9	Mar 15	Apr 5	A E Kelly	419 California st
Lady Bryan M Co	Nevada	4	50	Dec 27	Jan 30	Feb 28	—	203 Bush st
Lady Washington Con M Co	Nevada	1	20	Dec 22	Jan 26	Feb 14	W H Watson	302 Montgomery st
Mackey G & S M Co	Nevada	2	15	Jan 3	Feb 7	Feb 26	J M Budington	308 California st
McClinton M Co	California	5	25	Feb 6	Mar 12	Apr 2	W H Lent	309 Montgomery st
Mexican M Co	Nevada	10	2 00	Jan 10	Feb 13	Mar 4	C L McCoy	203 Bush st
Mono M Co	California	6	50	Dec 22	Jan 26	Feb 16	—	62 Nevada Block
Mountain View S M Co	Nevada	1	25	Dec 31	Feb 10	Feb 28	J Moore	309 California st
New York M Co	Nevada	21	5	Jan 26	Feb 28	Mar 20	D L Thomas	303 Bush st
North Belle Isle M Co	Nevada	2	15	Feb 5	Mar 10	Mar 31	E M Hall	327 Pine st
Original Gold Hill G & S M Co	Nevada	3	15	Dec 20	Jan 26	Feb 14	J M Buffington	309 California st
Potosi M Co	Nevada	3	50	Feb 5	Mar 11	Apr 1	W E Dean	203 Bush

200 Mexican	17½@18	150 Bullion	4.40
160 New York	42c	100 Bodie	10
310 Ophir	17@16½	50 Belcher	11½
30 Overman	6c	50 Crown Point	41
100 Potosi	44	100 C P Ravine	20c
240 S Nevada	24@25c	30 Con Imperial	65c
2700 S Utah	15c@16c	120 Gould & Curry	51
390 Silver Hill	1.45@1.40	40 Justice	1.90
200 Savage	6c@6½	100 Lady Wash	87½c
20 Scorpion	3½	60 Mexican	16½@16½
50 Utah	14	50 Mackey	15c
120 Union Con	37@36½	90 Mono	8
20 Yellow Jacket	9½	100 Martin White	90c
AFTERNOON SESSION.		200 New Coso	55c
25 Andes	87½c	20 Ophir	6@
875 Atlas	6c@15c	520 Silver Hill	1.40@1
50 Alta	44	70 Utah	13½
400 Atlantic	7@8c	50 Wells-Fargo	86c

California Board—Latest Sales.

Wed'sday A.M., Feb. 11.		70 Andes	90c
50 Alta	4.30@4.45	235 Argenta	1.20@1.15
190 Belcher	11@11½	90 Benton	2.40@2.80
10 Best & Belcher	9½	30 Belcher	11½
50 Bullion	4.60@4.45	30 Best & Belcher	9½@9½
120 Benton	2.95@2.90	75 Caledonia	1.05
1050 Curtis	80@90c	130 California	3½
100 Con Washoe	30c	140 Challenge	14
55 California	3.40@3.80	140 Con Virginia	3.40
75 Con Virginia	3.80	230 Con Imperial	61@60c
20 Challenge	1.80	60 Crown Point	41
200 Con Imperial	60c@61c	250 Enterprise	14
85 Crown Point	4.60@4.65	55 Exchequer	2.70
20 Chollar	6½	100 Goodshaw	40c
100 Caledonia	1.05	40 Gould & Curry	50
40 Exchequer	2.70@2.1	30 Hale & Nor	6½
30 Gould & Curry	51@52	180 Julia	1.90@1.95
35 Hale & Nor	6@6½	10 Justice	1.95
110 Julia	1.90	100 Kossuth	12½c
110 Justice	1.95	30 Lady Wash	95c
100 Leviathan	30c	110 Leviathan	30c
20 Mexican	17@17½	30 Mexican	17
200 N Sierra Nevada	70	100 Orient	35c
40 Ophir	16½@16½	30 Ophir	17½@16½
30 Potosi	4½@4½	30 Overman	6½@7
200 Senator	15c	70 Phil Sheridan	22½c
180 Silver Hill	1.45@1.40	200 Senator	15c
30 Savage	6@6½	100 Star	25c
30 Sierra Nevada	25½@25	50 Savage	6@5.90
100 S Bodie	50c	40 Sierra Nevada	23@24
100 Trojan	29c	150 Silver Hill	1.35@1.40
20 Union	37½@37½	950 S Utah	14@15c
100 Wells-Fargo	8c	100 S Bodie	55@50c
140 W Consstock	25c	200 Trojan	28@25c
30 Yellow Jacket	9½@9½	30 Utah	12½@13½
AFTERNOON SESSION.		20 Union	36@34½
1500 Atlanta	5c	100 Ward	1.70
1000 Ætna	5c	100 Wells Fargo	10c
30 Alta	4.40	20 Yellow Jacket	9½@9½

Mining Share Market.

During the past week the dullness previously existing has been greatly intensified, much to the disgust of operators and brokers. Sbould tbis stagnation continue to increase the dealers in stocks will have to seek other cbannels of operation. Witb many of tbem tbe profits fall far sbort of tbe necessary expense of continuing tbeir business.

Tbe agitation of restricting measures upon tbe operations of stock brokers is having its effect upon the market. All real evils should be eradicated; but enthusiasts are liable to go to extremes in the excess of zeal, and add to, instead of alleviating, the trouble.

But in spite of depression and agitation, the mines are producing in great excess of value over any previous period. Tbe bullion sbipments are rapidly increasing; there may be a falling off in some individual instances, but taken as a whole tbere is a decided advance in tbe amount of mining production. Nor is it a temporary increase; so many mines have been opened, and the dead, or preliminary work has been done upon them, tbat they are now in a condition to repay the great outlay tbat bas been made to render them productive. Tbe miners bave been sowing good seed, and are now reaping a rich barvest. The local value of the stocks is not real evidence of the value of the mines.

Bullion Shipments.*

Since our last issue, we have noticed tbe following bullion sbipments:

Paradise Valley, Feb. 3. $1,600; 7, $4,912.87; Wells, Fargo & Co., at Eureka, Feb. 1, $5,047.-88; Feb. 4, $3,415.12; Feb. 5, $2,400; Feb. 6, $1,000; Feb. 7, $1,058.71; Ricbmond, in Jan., $139,080.23; Feb. 3, $12,116.65; Feb. 3, $18,-986.06; Horn Silver, Jan 31, $9,646; Feb. 3, $5,200; Ontario, Jan. 31, $5,299.14; Feb. 3, $3,820.41; Feb. 6, $5,355.25; Feb. 7, $4,181.78; Stormont (on Jan. account), Feb. 2, $10,331.19; total in Jan., $48,088.72; Feb. 3, $7,906.85; Germania, Jan. 31, $2,890; Feb. 4, $3,730; Feb. 7, $2,420; Harrington & Melton, Jan. 30, $4,000; Con. Virginia, in Jan., $194,424,10; Feb. 2, $57,-661.81; Ophir, in Jan., $60,666.69; Feb. 2, $29,112.68; Frisco, Jan. 30, $8,240; Jan. 31, $9,646; Horn Silver, Feb. 2, $7,500; Feb. 3, $5,200; Feb. 5, $7,500; McCormick & Co., received from Jan. 31 to Feb. 6 inclusive, $64,-700; Feb. 7, $4,181.78; Ontario, Feb. 1, $5,299.-14; Feb. 2, $6,928.46; Feb. 4, $3,820.41; Feb. 5, $3,793.84; Feb. 6, $3,791.82; Christy, Jan. 31, $2,054.53; Feb. 2, $1,927.62; Feb. 6, $2,133.-15; Union Con., in Jan., $115,717.62; Feb. 2, $38,975.19; California, in Jan., $162,268.71; Oneida, in Dec., $10,434; in Jan., $5,478; Argenta, in Jan., $47,896; Endowment, in Jan., $4,525; Stonewall Jackson, in 1879, $79,343; Eureka Con., in Jan., 1,011,205 lbs.; Feb. 8, one week, 221,485 lbs.; Butte (Montana), two weeks, $43,000; Leeds, Feb. 6, $5,860.09; Salt Lake City (receipts one week), Feb. 6, $154,818; Hannington & Mellor, Feb. 6, $10,000.

*Desiring to make our list of Bullion Sbipments as complete as possible, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

An amendment to the Constitution bas been adopted by the Iowa House of Representatives making women eligible as members of the Legislature.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Yellow Jacket.—*Ledger*, Feb. 7: This claim, which is situated on Dry creek, has not been worked much of late, owing to a great influx of water in the shaft. Pumping machinery has at last overcome this difficulty, and at present four or five men are engaged taking out rock, with good prospects.

Empire.—This property is sending sulphurets to the chlorination works that are paying well.

Gover.—At the south shaft a pump is being put down, the water being strong. At the north shaft the rock for milling is being hoisted. This mine has some of the finest hoisting machinery and works in the State.

Maryland.—Two tunnels are being run toward the shaft, and will tap it at a considerable depth. The shaft is making slow progress. Sawed logs are being used for timbers. Close to the mine is a mountain of quartz. If there is enough gold in the rock to pay the smallest margin of profit it will prove the maumoth mine of the State.

Item.—On a new gravel claim parties are preparing to ground sluice the hillside close to the Chicago mine. The idea is to uncover a quartz lode that runs through the hill. Other parties are going to convey water on claims. An open cut has been run nearly a quarter of a milo in length, and over 11 ft deep in the deepest part. It has been cut through the hardest kind of slate.

Mine Sold.—*Dispatch*, Feb. 7: We understand that Mr. Jas. Morgan has purchased the quartz mining claim of Mrs. Holtz, in Murphy's gulch near town, for the sum of $3,000, and will commence the development of the same.

BUTTE.

Mining Notes.—Oroville *Mercury*, Feb. 6: B. F. Smith, of the Putnam gravel mine, Wyandotte district, came into town Monday. He disposed of $170 worth of gold dust at the bank, taken out by him and bis partner in 14 days. Mineral Slide district, on Little Butte creek, four miles below Magalia, is coming to the front again after being deserted for several years. O. H. Riley has opened up an extensive gravel mine of 100 acres, the gravel vein running from 20 to 150 ft in depth. The gravel is small and prospects exceedingly well. A water supply of 500 inches has been obtained, and the property is so situated that a very great fall can be given for pressure. The dump is unsurpassed by any other mine in the county. Mr. Riley thinks he has a big thing, and experienced miners who bave examined the property are unanimous in pronouncing it the most valuable hydraulic claim in tbis region.

CALAVERAS.

Knox & Osborn.—Calaveras *Chronicle*, Feb. 7: Developments at the Knox and Osborn mine, in Buckeye gulch, better known by its ancient name, the Boston, continue flattering. Rock rich in free gold and sulphurets is constantly being mined, and as work progresses indications that the ledge is a true vein are rapidly multiplying. This mine is under the superintendency of Col. W. T. Robinson, a thoroughly practiced miner who is urging development with great energy. Extensive machinery is to be placed upon the mine early in spring.

INYO.

Confidence.—*Independent*, Jan. 31: At 80 ft in the shaft a drift is run 30 ft south on the ledge, which is from two and one-half to three ft wide. It will follow the ledge to the outcrop on the side of the mountain. Fine silver ore has been taken out, and a blind ledge of gold matter cut, which is very rich. The bill is seamed with small ledges, and contains one gold vein connecting and running nearly parallel with the others. The formation is favorable, and the work done so far certainly makes a good showing.

MARIN.

San Rafael.—San Rafael *Journal*, Feb. 5: No report is yet obtainable from the ore being milled in San Francisco. It is only a little sample mill, and probably never before undertook a 10-ton job. Samples of the rock crushed are examined occasionally, and the interested parties appear to be satisfied. The force at the San Rafael mine has been largely increased. A tunnel is being run to strike the ledge, eight ft wide and seven high, and timbered with 12x12. It is in about 70 ft. From all that we bear, we cannot doubt that free gold is found.

MONO.

Annenda.—*Free Press*, Feb. 5: The vein shows well on the surface, from where it has been followed, clearly defined, to the 200 level, where it is exposed for a distance of 80 ft, and shown to be 15 ft in width, of somewhat low grade but paying ore, relieved by spots and streaks of marvelous richness. From here descending to the 300 level we find the ledge not only getting more solidified, but richer and of greater width, being fully 20 ft, and followed some 150 ft in length. Still continuing down to the 400 or lowest level, we find a greater increase, 300 ft of drifting having been done on the ledge, at least 40 ft in width, 19 ft of which is good milling ore, and 5 ft rich enough to satisfy the expectations of the most sanguine, and justify the expenditure rendered for the sinking of the new shaft. The surface locations of the Addenda company are three in number, and consist of the Addenda, Silver Queen and Ben Butler, each 1,500 ft in length by 100 in width.

Standard Con.—The main shaft has a depth of 75 ft below the 700 level, and is in hard porphyry, with an increase of water. The east crosscut on the 500 level has passed through a ledge three ft wide, of good ore; have started a drift north on the ledge. North drift on 385 level is in from the east crosscut 650 ft: ledge four ft wide; have upraised from this drift 57 ft, showing a ledge four ft wide, of good ore. The south drift is in 325 ft, with a ledge in the face three ft wide, of good ore. During the week have commenced to upraise on the Cook ledge at a point 60 ft south of the main east crosscut. The ledge is three ft wide, of good ore. The north drift on the east ledge, 300 level, incline, is in 139 ft, with a two-ft ledge of good ore. South drift from west crosscut, 300 level, incline, is in 157 ft; ledge three ft wide, of rich ore. North drift on 550 level is in from the winze 55 ft, with ledge three and one-half ft wide, of good ore. The ledge in the stopes on the 550 level is eight ft wide, and looks well.

South Bulwer.—Sinking the main shaft, which is down 491 ft; timbered to the bottom; pump working well, and handles the water easily; work in winze No. 1, on 350 level, has been suspended, owing to a flow of water. This will be drained by the shaft when further depth is attained, and work resumed in a few days.

Bulwer Con.—The north drift on the Ralston ledge is in 39 ft from the Bulwer tunnel; ledge two and one-half ft wide. The south drift has a total length of 45 ft; ledge in face three ft wide, and good ore; total distance from bottom of winze, 41 ft; ledge two ft wide. The Ralston ledge is three ft wide, of good ore.

Summit.—The north drift on the 630 level is in from the shaft 73 ft; ledge two ft wide. In the south drift, which is in 82 ft, the ledge is three ft wide, and looks well.

Queen Bee.—North drift on the 400 level is in 51 ft; the ledge is looking well, and is six ft wide, of fair ore. It is improving as the drift advances.

Tioga.—The Syndicate drift, on the 520 level, is in 659 ft, and will soon connect with the Syndicate tunnel, which is only about 49 ft distant. The east crosscut from the Ralstou winze, on the 620 level, has cut some valuable stringers of ore, one of which is six inches in width. The shaft is down 760 ft.

Booker Con.—On the 400 level, 120 ft from the shaft, a ledge two and one-half ft was cut. The ledge prospects well. Crosscuts will be run east and west immediately. The south drift, on the 300 level, carries a vein about 20 inches wide.

McClinton.—*Chronicle*, Jan. 31: The south drift from the east crosscut, at the new shaft, has been extended to a distance of 67 ft, at which point a crosscut has been run west five ft, reaching the west wall; and a crosscut has been run east 22 ft, with the face still in the ledge. This crosscut will be continued to the east wall, striking it at a point about 77 ft southerly of the main crosscut, which will pretty well define the course and direction of the ledge, so as to govern the direction to run for the ore body on the lower levels. On the 500 level from the north drift, 200 ft from the shaft, the west crosscut is run 28 ft. On the 675 level the north drift is in 82 ft. The ledge is widening and looks well. On the same level the east crosscut is in 77 ft, with bunches of quartz in the face, having during the past week passed through a fine stratum of quartz.

Maryland Con.—The shaft is down 457 ft, and is in vein formation. The drifts in the upper levels are still in good ore. Crosscutting on 500 level will soon take place for the Maryland and Berdle Hyde ledges.

South Noonday.—The shaft is down 130 ft, securely timbered from the surface to the bottom.

Sonora Con.—Still driving the crosscut on the 100 level; total length of drift 94 ft. Cut a ledge of decomposed quartz and clay, looking more favorable than either of the five veins heretofore cut in the shaft and drift.

Original Summit.—Are now drifting north and south on the ledge at the 105 level. It carries from six to eight inches of very rich free gold ore; the formation is hard, but the indications are good.

NEVADA.

El Capitan.—*Transcript*, Feb. 7: The north and south drifts, at a depth of 150 ft, are being pushed ahead. In the former the indications are fair. Will start another level 100 ft below the present one before the cbute dipping north, and supposed to be the best in the claim, can be tapped.

Jacobs & Sargent's.—Gravel of a good quality is coming from the new shaft. The cement mill has begun crushing.

Wyoming.—Some very rich ore is coming from an 18 or 20-inch ledge.

Derbec.—The gravel continues to improve steadily, and the size and frequency of bullion shipments have increased by a large percentage. The cold weather and snow have, for a few days, interfered somewhat with operations, but as soon as they are gone, affairs will assume a still more satisfactory shape.

Yusa.—*Foothill Tidings*, Feb. 7: Up above Washington, continues to show "way up" in the way of a large ledge with gold all through it. It never looked so encouraging as now. When spring opens the stamps will be set at work.

Kings Hill.—Has 70 loads at the Orleans mill awaiting a crushing.

Centennial.—*Union*, Feb. 6: On Osborn bill tbe work is being done south of the main shaft, in which direction the best pay ore has always been found. The shaft is down 425 ft, and from this the No. 3 level is opened 400 ft south, giving good pay rock the whole distance. The first and second levels south also carry good pay ore. A new shaft is rising to the surface, from the lower level, 400 ft south of the present working shaft, and will be completed in a few months, when the hoisting machinery will be moved from its present location. With this new shaft it can work its south ground to better advantage, and he nearer to the best pay ore. It has 100 loads of ore being worked at the Orleans mill, which will give $70 per ton.

Flanet.—Rich gravel has been struck. The clean-up of 51 carloads (of 1,000 pounds each) amounted to over 3½ ounces of pure gold, worth $66, or $19.25 per ounce. The gravel was taken from the edge of the channel, as is evidenced by the gold being fine, whereas in the center of the channel, as is found in the "Swamp Angel" claim adjoining, a great deal of the gold is coarse. There is a large extent of ground that will take many years working to exbaust, the tunnel and drift upon which is now about 2,000 ft in length.

Idaho.—The ledge in the No. 10 drift east, which was quite small some months ago, is now of strong size, though of low grade. It is in over 1,000 ft south of the main shaft. The No. 11 drift is showing a strong vein of good ore. The east shaft, below the No. 11 drift, also shows a strong vein. The company have declared a regular montbly dividend, from the earnings of January, of $1 per share, amounting to $3,100.

Mining Items.—The new mill of the Rocky Bar company will start up in the early part of next week. It was expected that the stamps would commence dropping this week, but there are some finishing touches required that will make a few days delay. The hoisting machinery of the Allison Franklin mine has been purchased by the Fortuna mining company, and will be removed to their property near Nevada City. The Bullion mill, on the Colfax road, is running constantly on custom rock. It finished a crushing from the Ben Franklin mine a few days ago, and is now engaged on a run of rock from the Alaska mine. The Republic mining company, located at Kress' summit, will put up steam hoisting machinery this spring. The shaft is down 100 ft on a strong ledge, but pumping machinery must be put in to bandle the water, which is too quick for hand work. The Virginia mining company, a new incorporation, proposes to commence work in a short time. The location is to the east of the Maryland, which is the first extension east of the Idaho mine.

PLACER.

Bellevue Hill.—Auburn *Herald*: The Tremilling brothers have their shaft down 120 ft. At this depth they are running a west drift, which is in 20 ft. The rock in both shaft and drift averaged $70 per ton. The ore they are now taking out of the drift, it is believed, will yield as high as $700 per ton.

Alamatah.—J. M. Bryan has put up a new water wheel and pumping works on the old Alamatah ledge, near the Bellevue. He expects to prospect this lead, which he believes will prove remunerative.

Alabama.—A. J. Cook & Co. are putting a shaft down on an extension of the Alabama lead, not far from Penryn, and have a fine ledge with some good looking ore.

Scott.—Antone Smith and Jas. Denis are working the old Scott lead on Dutch ravine, about a mile below Newcastle, and are taking out some very good rock. They have ore on the dump which is estimated to go from $80 to $40 per ton.

Chicago.—The Chicago company, on the northern extension of the original old Stewart's Flat lead, formerly known as the Hanson mine; have an engine for hoisting purposes, and are down about 80 ft. They have a 2½-ft ledge, and very promising looking ore.

Sailor.—W. H. Puffer and the McCloud brothers are at present prospecting on an extension of the Sailor lead. They have hardly done enough yet to indicate the result.

Decker.—Messrs. Morris, Brooks and Price, who, for some time have been working the old Decker lead, on Dutch ravine, between Auburn and Newcastle, are down 80 ft, have a five-ft ledge, and are taking out rock that it is thought will go not less than $20 per ton. They contemplate the erection of a mill at an early day.

Rich Strike.—O. W. Wilson is prospecting a ledge about a mile and a half south of Newcastle. He is down 55 ft, and has a two-ft ledge. At that depth he is running a drift, and what rock is coming out looks first-rate. Rock taken from the bottom of the shaft assayed over $700 to the ton—gold and silver.

Yankee Hill.—Allen and Larue have purchased a gravel deposit known as Yankee Hill, near Pino, and are making preparations for working it by hydraulic. To get the requisite pressure they will have to lay about two miles of pipe, and have purchased the 22-inch iron pipe formerly in use at the old Auburn mine, which will soon be put in place.

Bonded.—A drift claim near Rocklin, owned by Frame & Co., which has been worked with good results, on a small scale, was bonded recently to a San Francisco company, who will prospect it.

Julian.—Located on Jenny Lind flat, a short distance below Newcastle, was sold to an incorporated compauy of New York capitalists, for $200,000. This mine has been developed into a fine property, with all the necessary machinery for hoisting, crushing, etc., out of its proceeds. The ledge averages between four and five ft in thickness, and is uniformly of a paying quality. The mine is well opened and in a good condition for future operations. The new owners propose to increase the capacity of the 20-stamp mill, with a much heavier set of stamps, new battery blocks, and six new concentrators.

PLUMAS.

Green Mountain.—Plumas *National*, Jan. 31: The developments are likely to show as great an ore body in this mine, as that of the famous Plumas Eureka on the south of the same mineral belt, with many of the same characteristics. For nearly two years work has been pushed forward to open the immense ore body of this mine, at the depths of nearly 1,000 ft below No. 1 tunnel and surface workings, where such rich ore was extracted. The two veins that were worked separately in the upper mine, came together about the line of tunnel No. 3, 600 ft below tunnel No. 1, forming an immense ledge. At this point a shaft was sunk 60 ft and crosscuts run which showed the ore body 80 ft wide, with a perceptible increase of width as depth was gained. No. 4, or lowest tunnel, on a level with the mill, is the point where the late strike was made. This work has been running for 18 months, and the ore has been struck sooner than was expected. There is no estimating the size of the ore body at this point, but it is certainly very large. All ore now taken out is sent to the mills. Owing to its great water facilities and location the maximum cost of working ore from this point will average $2 per ton; the grade of ore is from $6 to $40. This mine can be worked by tunnels for 1,000 ft below the present lowest workings.

Crescent.—This is a continuation of the great ledge running through the Green Mountain. Although the Crescent has never been worked to a greater depth than 250 ft, $1,250,000 have been taken out, and over $600,000 paid in dividends. A new shaft will be sunk 500 ft, the point of location being beyond the old works and towards the Green Mountain mine.

TUOLUMNE.

Ferguson Con.—Sonora *Democrat*, Feb. 7: The mine is fully opened and the reserves in sight are very large. They are erecting new hoisting works and are putting in two air compressors to supply ventilation; with these in operation, the prospects of continued dividends appear assured. The ore is paying from $20 to $28 per ton. The last run of 19 days yielded 210 ounces, or about $3,600. They have declared a dividend amounting to $5,000.

NEVADA.

WASHOE DISTRICT.

Ophir.—Gold Hill *News*, Feb. 11: The pumps are running to the 2500 level, and to-morrow sinking will be resumed in the incline. The main north drift on tbis level is 156 ft from the incline station. The east drift, same level, is in 47 ft. The joint Mexican crosscut west on the 2300 level has been discontinued and a joint crosscut started east. The north drift on the Hardy vein, 2100 level, has been turned into an east crosscut. An air compressor, driven by the weight of the descending incline cable and giraffe and thrown out of gear when the cable is ascending, is in place and only waits a heavier friction clutch to add 3,000 cubic ft per hour of 80 pounds pressure to the working power of the mine and to aid as a brake in controlling the descending cable and giraffe.

Belcher.—On the 3000 level the drifts south, east and north are being pushed ahead. The east drift is showing some favorable looking vein material, as is also that south. On the 2700 level the north drift from the crosscut east cuts quartz and bunches of ore.

California.—On the 2450 level the main lateral drift south is cutting hard porphyry, and has its face 95 ft south from the Ophir line. The east crosscut on the 2250 level, running from the main lateral drift north, is in 30 ft. From the main north drift, 1500 level, and 150 ft north of the main west drift, a crosscut has been started west to explore the ground east of the old stopes on this level. The north drift, 850 level, has reached a total length of 220 ft, and is cutting vein porphyry. Preparations are being made to resume stuking at the C. & C. shaft.

Union Con.—The east drift from the stopes on the 2400 level, continues to cut the same heavy vein formation, carrying streaks of good ore heretofore noticed; total distance of the face from the Union shaft, 283 ft. The drift south and east, running from a point where the ore came in east of the stopes, is in 35 ft. The drift east from the Union shaft on this level is now 125 ft from the shaft.

Sierra Nevada.—The south end of the mine is now worked, and men, materials, etc., for that section passed through the Union shaft. The winze below the 2400 level is down 35 ft, but has not yet reached the ore vein. The drift north on this level is still in promising vein material. On the 2300 level the main north drift continues to cut good vein matter.

Mexican.—The north lateral drift on the 2300 level is in progress toward the joint Union winze from the 2000 level.

Utah.—The incline has a depth of 200 ft on the slope below the 1750 level. The south drift, 1750 level, has reached 120 ft. East crosscut, same level, is penetrating a fine vein material, the face 100 ft east from the station.

Julia Con.—The south drift, 2000 level, headed for the perpendicular of the winze from the 1800 level, is making four ft per day. In the winze some time has been spent casing the timbers; total depth of the winze, 250 ft.

Savage.—The incline has attained a depth of 204 ft on the slope below the 2200 level. The drift from the C. N. S. shaft on the 2400 level is in 360 ft in length and making excellent progress toward the incline.

Bullion.—When the north drift on the 2250 level is sufficiently away from the station, a crosscut will be sent west into the ledge. Sinking below the 2350 level bas been resumed. Both workings are in vein porphyry with stringers of quartz.

Hale & Norcross.—The winze on the Cbollar line is down 135 ft. The flow of hot water into the winze continues strong and hinders work. The north crosscut, 2200 level, is in 135 ft.

Crown Point.—Pushing the crosscut joint with Belcher east on the 2700 level. Sinking the incline below tbe 2700 level.

Best & Belcher.—Tbe joint Con. Virginia east crosscut, 1900 level, is now in 63 ft from cutting vein porpbyry.

Sutro Tunnel.—Excellent progress is being made in the headers of both north and south lateral drifts.

CINNABAR DISTRICT.

Humboldt Bullion Bed.—*Silver State*, Feb. 5: A contract has been let to sink a shaft 100 ft on Bullion Bed. The ledge, which crops out for 2,000 or 3,000 ft on the mountain side, is one of the largest ever found in Humboldt, so far as the croppings denote. It was located in early days, but never prospected to any extent, although it is accessible at all seasons of the year, and situated on a thickly timbered mountain. The croppings assayed from $15 to $45 to the ton in silver, but this was considered too low to pay for working in early days.

EUREKA DISTRICT.

Richmond.—*Sentinel*, Feb. 6: The usual telegram from the mines at Eureka states that the week's run was $60,-000, from 900 tons of ore. During the week the refinery produced dore bars to the value of $40,000. The Manager's report contains several important items. The 400 drift from No. 15 chamber is now in 54 ft, all the drift being in good ore. The chambers are all looking very well; in the new chamber (No. 15) they have already opened out and exposed a large body of ore. A winze is being sunk from the bottom of this chamber, and a raise is being put up from the No. 13 chamber, both of which are in ore, and they expect to make a connection in two or three days. When this is completed they will have ore connection from 30 ft above the 400 to the 600 levels, a distance on the incline of the ore of 350 ft. All the other chambers are opening out very well. The furnaces are in good

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California State Dental Association.

President's Annual Address.

The following extracts from the excellent annual address delivered before the ahove Society hy its President, Dr. S. W. Dennis, M. D., are full of interest to all who wish to see the medical profession, and all its special hranches raised to a higher standard; to all who desire the practitioners of the healing art to he men of culture and of science; not mere empirics, practicing according to remembered formulæ, or trusting to mere mechanical skill to pull through a difficult operation; hut men who have etudied life and the diseases of life; who can investigate causes, and who are ahle to make allowance for the physiological peculiarities of those whom they practice upon.

After a few words upon the President's duties, and an expression of opinion adverse to arhitrarily fixing a regular scale of fees, Dr. Dennis goes on to state that, out of 240 dental practitionere in California, only 60 helong to the Dental Association, yet that thie is a larger proportion than obtains in some other States; Michigan for example; he then proceeds as follows:

Difference in Opinion.

"Why shall we not differ in opinion?" We certainly may, hut while we claim the privilege, let us not forget that every difference in opinion is not a difference in principle. The popular idea is hest illustrated hy the case of a lady who came into my office only a few daye ago and asked my opinion. I gave it, when she said: "If I could find two dentists of the same opinion, I could decide what to do." Now, I am unahle to see why there should not he a difference of opinion among us as well as among other professions, or callings; a pathological condition in two persons might, to a superficial ohserver, appear the same, hut to the careful one quite different. I know of no way to illustrate this point hetter than to cite the frightful maladies that result from inahility to recognize conditions that demand radical treatment. A perеon may lose half or the whole of his maxillary hy an attempt to retain one dead tooth, or, more technically speaking, one devitalized tooth. It might not he agreeahle to tell the patient that he ie syphilitic or even strumous. The physicians, I mean the general practitioners of medicine, some of whom seem to think that our professional sphere is circumscribed hy mechanical principles, would say: "It is your business, only, to dig out holes in teeth and plug them." But we know hetter the houndaries of our field of usefulness.

In the theological profession also, there is a wide difference of opinion; wider, indeed, than in that of dentistry or medicine, yet the various associations of disciples all have a "saving ordinance," or one platform upon which they cau etand. Now, I helieve a study of the lawe that govern this universe, the infinite mass, the atomic and molecular relation of the elements of matter, and the application of that knowledge in our profession, is our "saving ordinance;" and, while I would not deny anyone the comfort and satisfaction of considering their future spiritual welfare, I feel like encouraging a more careful inquiry into the physical condition of our present state.

Transplanting Teeth.

A live American has gone to Paris, France, and revived the practice of replanting, and transplantiug teeth.

If there are any who do not distinguish the difference hetween replanting and transplanting, I will explain that one is returning a tooth to the place from whence it came; the other is transferring it to a new soil.

Dr. Bogue, of New York, considered this euhject quite ahly in a paper read hefore the New York Odontological Society, in which he eaye: "I hold in my hand ahout fifty references in regard to transplantation and replantation of teeth. These references range all the way from 1777 to 1877, and they are all records of experiences. These experiences are as various in their character as the persons whorecount them; hut they all tend to ehow that there is no physiological reason why replantation when necessary, and transplantation under favorahle conditions, should not prove successful," etc., etc. *Vide* Transactions for 1877.

If we had no other literature than this from which to draw a conclusion, I should eay it would he well for us to consider our cases thoroughly hefore we hid for puhlic approhation in experiments of this kind, where the transmission of disease is so likely to follow.

If the immortal John Hunter, who made syphilis in all of its varied contagion a special etudy, could not detect the presence and prevent the transmission of this disease, how can we, in our circumscribed sphere of action, expect anything hut evil results from this line of practice?

In Hunter's days experiments—for experimente they were to some extent—were more justifiahle and necessary than now, for there were not many, if any, dentists then, and artificial dentures were *almost* unknown, while now we have a few dentists, and artificial dentures are plenty, *cheap* in all cases, aud *quite* artistic in *some*.

It may not he uninteresting, however, to give authority that these operations *may* prove succeesful, ae well as that disease is liahle to he tranemitted.

[Dr. Dennie, then, details several casee on record, in which syphilitic diseaees were transmitted hy the transplantation of teeth, and showe that the method is not a new one, as most people suppose from newspaper notices of it, hut as old, at least, as the time of John Huuter, from whom, in fact, some of the cases he gives are quoted.—Eds.

Legislative Enactment.

I think the practice of dentistry ought to he legalized in this State, as it is in many other States. I look npon this as the most important step in advance. If every State in the Union, or the General Government, if you please, should limit the practice of medicine and its collateral branches—dentistry heing one—to those only who have degrees, or certificates from regularly authorized colleges for the development and perpetuity of that branch of knowledge, the standard of professional education would advance ten-fold, and thus the physical well-heing of the American people, who intrust their lives and health to the profession, would he enhanced in the same ratio. The legal fraternity may say: "Yes, one has said the State can do it, hut the General Government cannot." I said, "It could if it would." "Yes, hut it is not likely that it would, for it would have to amend the Constitution." The National Constitution has heen amended three times in 20 years, and in that time the United States has expended $3,000,000,000 in war, and crimsoned her soil with hlood hy a sacrifice of 500,000 valuahle lives, and her crippled patriots are legion. And still we are told the General Government can do nothiug for the protection of the people!

A sign, "hearing for its motto the miserahle delusion," "Dr." or "Dentist," means *nothing*. In other words, it means simply that some one is practicing medicine or dentistry, as the case may he. But when you see the title of "M. D.," or "D. D. S.," used legally, it ie evidence that the party has taken some steps towards qualifying himself; has contrihuted something toward education and in favor of educational inetitutions. Of course it has heen and will he said, "going to a dental or medical college does not make a good dentist." Will not the opponent of these views, in favor of education, he candid, forget himself for the moment, and say, as inferior as the young graduate may he, to the mau who through long yeare of close application and hard study has made his mark, that he is not hetter for having taken his collegiate courее? We know that in this city there are some men who have not taken these preparatory steps, and are hetter operators, and perhaps hetter dentists, than *some* of those who have.

But are we not prepared to say that the close observer of mechanical principles, of causes and effects, may not he much improved hy a reasonahle scholarship, under didactic teaching, upon the fundamental principles of medicine and its collateral branches?

If we do not take this ground, why should we claim our art to be a profession?

I should have to declare it to he a misnomer. In my opinion it would he a proetitution of a long cherished and noble English word.

Only yesterday, a friend of mine, from Rhode Island, said that a short time ago he knew of two young men who hargained with a dentist in his native town, to teach them all he could in one week. The dentist did so, and at the end of that time the young men went West and entered practice. It is uot necessary to go away from home for such instances; we have plenty of them under own observation. And still we find men in the Legislatnre and in the profession who oppose legislative prohihition, when they are aware of the existence of such a state of loose practice. If I desired to he popular, I would advocate the opposite, if I advocated any side at all. But I receive more satisfaction in heing with a minority on the right side of thie suhject, than I should with the unthinking majority on the wrong side. I have also the satisfaction of saying that my present position on this suhject is consisteut with my past. The records will show that the first report made hefore this association ou dental education was hy myself; and in which I embodied the same sentimeut as herein expressed.

One of the greatest difficulties in the way of the passage of a law for the regulation of the practice of dentistry, is the fear of the enactment of laws operating againet those now in practice.

Such laws are *ex post facto* in their nature and are declared unconstitutional hy the highest authority. I have no doubt every memher of our association would oppose such a law, and for own part, I am most earnestly opposed to any euch retrospective measure.

But when a Bill, or Act, ie introducted into the Legislature that shall effect only those who will not avail themselves of the opportunities of a higher professional education, or who seek an asylum among us from the effect of similar laws in other States, I shall favor its enactment; and I am unahle to see why a law of such prospective heneficial results should not have the support of the profession, the press, and the people, whom it is designed to heneflt.

Education.

Whatever difference of opinion there may he among us upon minor questions, we ought not to differ much upon this. No one feels the value of an education so much as the students of nature, who have a view of the promised land and cannot reach it. And none value it so little as those who have had the opportunity of an early education thrust upon them, and have not had the energy and indnetry to apply it to the solution of the prohlems of life. Too few obtain knowledge for the sake and love of it, more particularly when it yields no immediate results; and many are too much interested in making a good showing of what they have. Such habits of life may he termed intellectual economy, instead of intellectual growth. Thomas Starr King says: "The preparatory school aud the college lay the basis of the power and the satisfaction with which, in after years, the work of life will he discharged. Young men do not go to college to complete their education, hut to draw the ground-plan of it, and tolay theundercoursee of a future building deep and firm. To use the worde of St. Paul, in a secular sense, they are there laying up for themselves a good foundation against the time to come. And the yeare are profitahly used just to the extent that hahits of mental industry are formed, loyalty to truth confirmed, and the principles which underlie and support knowledge and culture are laid and cemented imperishably hy the masonry of application. Nobody can become wise in the hest college on this planet, hetween 12 and 20. But a youth of capacious powers can do more in those years toward enlarging the resources and ennohling the proportious of his meutal character and influence, than in twice eight years after he ehall have taken up the task of life. It is no time to look to the lower tiers of the edifice after the rafters are up and the roof is on. It is no time to he attending to a crack in the hasement, or a leaning wall, after the huilder has moved into the house with his family. The hest he can do ie to move out of it and huy another, and spend largely to have it put in friendship with mathematics and gravitation. But a student cannot remove from his mental house, in his husy years, although he may see that the ground tier of the stone is not hased right, and the walls are not thick enough for the weight they must hear. And then the misery that comes! To feel the need of fundamental instruction, which might have once heen thoroughly acquired, while the mind must act and in responsible callings, too, as though it felt secure! To he under the necessity of heing student and worker, journeyman and artist, in the eame hour, without the satisfaction that helongs to either hranch of toil, and with the hurthen of practical, and, perhaps, very important duty upon the hands and conscience—this is a species of refined and exquisite agony which many a professional man in our day experiences, and which is the penalty eitber of an enforced adoption of the duties of a profession without ample preparation, or of wasted academic hours."

The old adage, that "necessity is the mother of invention," is applicable to our department of Medical Science.

When attention was first attracted to the prevalence and progress of disease of the dental organs, any one could and was allowed to enter the profession—so-called—and practice dentistry; hut now the opportunities are so great for something more than an empirical knowledge, should they not he required to have it? It would not only seem proper, hut eminently wise, that practitioners should attain eome degree of technical education, even though it might not he all that conld he desired?

I would have every practitioner of dentistry after this date a graduate, and then all the quackery, if any, would he confined to *them*. The standard would he elevated, or there would he a higher plane than at present. As it is now, the graduate has the advantage of the non-graduate, hecause the degree of M. D., or D. D. S., is *prima facie* evidence of qualification; and, all things being equal, the community would seek the services of the former, and not the latter.

The time will never come, however, when there will not he two extremes; when the degree of natural and acquired qualification are so equalized that people will not have to eeek other evidences of worth—those of professional integrity, culture and character.

If there is any one thing in which Americans are pre-eminent ahroad, it is their deutal skill.

As much as the royalty of foreign countries may desire to encourage home art, home culture and home industry, if not to say home superiority, they have looked on thie side of the Atlantic, and to America, for the highest degree of perfection in our specialty.

Good dentistry meane industry, intelligence and skill; *bad* dentistry means indolence, ignorance and avarice. What has heen said of "language" will apply also to every department of life.

Whatever loses the vital principle of renovation and growth, tends to decay; and if mere copyists, compilers, ahridgers and modifiers he encouraged, as they are now, language surely will not he improved. Style is liahle to he antiquated hy time, corrupted hy innovation, dehased hy ignorance, perverted hy conceit, impaired hy negligence, and vitiated hy caprice; and nothing hut the living spirit of true authorship, and the application of *just* criticism, can counteract the natural tendency of these causes.

I will quote Prof. Lionel Beale, to show the danger of accepting *authority* for *fact:*

"Sufficient distinction has not, I think, heen drawn hy many hetween science and the statements put forward in her name; hetween scientific demonstration, and the facts said to have heen demonstrated hy investigations called scientific; between the actual discovery of new truths, proved heyond all question, and mere assertions, sufficiently dogmatic, dictatorial and positive, hut resting upon authority instead of upon evidence.

"Authoritative assertion damagee the interests of science, and arrests the progress of truth; for science can never acknowledge any authority whatsver. Her truth rests simply upon evidence; and the more carefully and the more minutely the evidence is sifted, the greater is the gain to science. Unfortunately, however, in every stage of scientific progress, instances are not wanting in which mere positive assertione have heen implicitly helieved, and when these have proved to he erroneous, new assertions as positive have taken their places, to he in their turn refuted, and replaced hy others. And this must ever be, if people pereiet in accepting scientific statements upon authority alone, and refuse to study the grounds upon which the statements are said to rest."

The Metal Market.

From James Lewis & Son's mouthly report we gather the following:

Copper—There has heen a eharp advance in value of Chile har copper during the past month; the sales were large and the prices ranged from £71 to £74; bcst selected advanced to £81 10s.

The charters for Decemher were 3,600 tons fine copper.

The arrivals at Liverpool and Swansea have heeu 5,656 tons; the deliveries have heen 4,928 tons fine.

The sales of furnace material have heen 6,881 tons of ore, from 8¾% to 15%, at 13s. ¼d. to 13s. 9d. Precipitate, 1,227 tons at 13s. 3d. to 13s. 9d.; 50 tons Rio Tinto leaf, included in above, sold at 13s. 11d. Barilla, Cohiga, 50 tons at Liverpool, 14s. Regulus, Chile, to arrive at Swansea, 320 tons, 14s.

The Chile exports for 1879 were 54,878 tons fine.

Stocke of west coast produce are, tons, Liverpool, hars, 26,716; ingots, 50; Regulus, 29; Swansea, hars, 4,609; Regulus, 1,870; ores, 770; equal to 32,384 tons fine, againet 30,490 tons on Dec. 1st.

Stocke of other than Chile produce are 11,582 tons fine, against 11,709 tons Dec. 1st.

Quotations Jan, 1, 1880, are—Bars, good ordinary hrands, £65 15s. to £66 10s.; and for distant arrival, £67 5s. per ton. Ore—13s. 6d. to 13e. 9d; and Regulus, 14s. to 14s. 8d. per unit.

From other sources we gain the following (at London to Jan. 6th):

At the Swansea Ticketing this day, 2,033 tons of ore, averaging 10% produce, sold at an average price of 13s. per unit.

The sales of the day amounted to 800 tons, Chile hars. Cash metal realized £66½. For parcels with extended prompts, huyers paid £67½ to £68, according to time of delivery. Some favorite marks eold at £67, and best hrands at £67½, cash. The market closed steady at £66½ for G. O. Bs., cash; £76 has heen quoted for hest selected, and £71 for Chile hars.

Australian—£74 to £76; tough cake, £70 to £72; hest select ingot, £71 to £73; India sheets, £74½ to £75½; yellow metal sheets, 6½d. to 6¾d. per pound.

From the *Engineer and Mining Journal* of New York, Jan. 24th, we copy the annexed:

The sales amount to from 3,000,000 to 5,000,000 pounds for spot and future delivery, selling up to 25 cents at the close for spot, while 25½ cents is asked for March delivery. The market for this article is in a very excited condition, being at the mercy of the companies and the speculators.

We are further indehted to the circular of James Lewis & Son for the following quotations:

Lead has advanced to £19 5s. to £19 15s. for ordinary shipping hrands; and £18 15s. to £19 per ton for Spanish soft silver.

Antimony has risen to £64 to £66 per ton for French Star Regulus.

Tin—The closing quotations are £99 for Straits with an upward tendency.

Wickenburg.—From time to time we have mentioned the fact that W. E. Smith & Co. were preparing to work the tailings of the Vulture mill hy a new, simple and cheap process, which, if euccessful, would prove to he of great importance to miners in Arizona. We now have the gratification of knowing that the process not only does the work well, hut surpasses all that was claimed for it, and far exceeds the most sanguine expectations of the gentlemen who are handling the works and own the patent for Arizona. The men in a very ehort period, with simple, cheap machinery, have reduced quite a large quantity of tailings, realizing 60,000 pounds of concentrations, worth several hundred dollars to the ton. There is not a mine in Arizona hut what can he worked for the free gold and the tailings, after heing treated hy this process, and made to yield to the last cent all the precious metal in the ore. Thc tailings at the Senator, Peck, Big Bug and other places can all he made to pay largely hy Mr. Smith's method of treating them. We think this is quite a feather in the caps of mill and mining men who have great quantities of rebellious ore to work, and hope they will confer with Mr. Smith, and allow him to introduce hie new process at every mine in the county.—*Arizona Miner.*

The Engineer.

Channel of the Mississippi and its Tributaries.—The improvement of the channel of the Mississippi and its tributaries, by an elaborate system of levees, is now being urged upon Congress. The House committee, to whom the subject had been referred, are reported in the public prints of the past week, to have taken a very sensible course in reference to it. The committee, it is said, have concluded, after a thorough and careful consideration of the whole subject, that the best mode of ascertaining the necessities of the districts affected by the river will be by personal examination and inspection. They have, therefore, proposed to send a committee to visit the localities in question, and to obtain the opinions of experts, pilots, and others who are familiar with the physical condition of the river from its mouth as far up as St. Louis. Some difference is reported to exist in the minds of this body as to whether either the levee or the jetty system is the best method of attaining the desired end. The total cost of the proposed system of levees is estimated to be about $60,000,000. Meantime, the "Mississippi River Improvement Convention" has met at Quincy, Ill., and adopted a resolution appointing an executive committee to prepare a memorial to Congress, setting forth in detail the views of the convention on the subject of the improvement of the river channel, to collect and publish statistics bearing on this subject for the information of the people and the government, and to use all proper means to promote an early and favorable action on the subject by Congress.

Plumbago as a Lubricator.—The *Engineer* gives this example of the value of black lead as a lubricator: "A fly-wheel shaft hearing, eight inches in diameter and 10 inches long, carried a load of nearly 10 tons. The bearing was supported on a box girder, and was lined with good brass. The engine could not be run, as this bearing invariably got nearly red-hot after a few revolutions; various oils, tallow, sulphur and gunpowder were tried with most indifferent success. By using a mixture of tallow and sulphur the engine could be run half an hour at a time, and once or twice has run a whole day, the shaft making 60 revolutions per minute. It was determined to have a new crank shaft with a longer bearing, but as at the last moment the use of black lead and tallow was suggested, a package of the ordinary black lead used for stoves was worked up with some tallow, the bearing carefully wiped, and the grease box on the cap filled with the mixture. The hearing never heated again unless oil was allowed to get access to it. The success of the plumbago as a lubricator was perfect. It should be added to the foregoing that while the principle of lubricating by graphite, or plumbago, is scientifically correct, and has in thousands of instances been practically illustrated, it has been damaged seriously by the use of impure graphite. For perfect success the graphite should be absolutely clean.

Proposed River between Manchester and Liverpool.—A meeting has been held in Manchester for the purpose of considering the expediency of the proposal for the construction of a tidal navigation for seagoing steamers between Manchester and Liverpool. At this meeting Mr. Hamilton Fulton, the engineer, explained the nature of the proposal, and stated that the length of the channel between Manchester and Liverpool would be about 36 miles. The minimum width of the navigation would be 200 feet, and the minimum depth at low water spring tides would be 10 feet, or about two feet more water than exists at low water over the bar at the mouth of the Mersey. A basin would be provided at Manchester end of 81 acres with 16,000 lineal feet of well-constructed wharves, and all requisites for shipping accommodation on a large scale. The estimated cost of the undertaking is £3,500,000. Mr. George Hicks, of Manchester, presented a statement as to the probable revenue, which, if realized, would give a large return upon the proposed outlay. Owing to the inability of several members of Parliament and others to attend, the further consideration of the subject was adjourned.—*Warrington Guardian.*

Chicago's Tunnels.—Chicago is much dissatisfied with the tunnels built under the river which divides that city, with the object of relieving the blockade of vehicles in the streets. When they were built, 12 feet of water was considered enough, but vessels have increased so much in size since Chicago was made a port of entry, that ships and steamers are constantly "humping" or scraping their keels on the arches of the tunnels aforesaid. The shallowness of the river is so serious a drawback to shippers of grain, coal and lumber, that tearing up and rebuilding the Washington street tunnel is strongly urged. This is a warning to large cities, lest they build streets in such a manner that ships are compelled to sail over the heads of those who frequent the public thoroughfares.

Electricity in the Future.—Dr. Werner Siemens, of Berlin, in a lecture on "Electricity in Service of Life," dwelling on the electric transmission of force, prophesied that "the energy of the solar rays, manifested in currents of air or in falls of water, may by-and-by, through the electric current, furnish all necessary heat, and render us independent of ordinary fuel."

Useful Information.

On Rotting Wood.

We condense the following from an interesting lecture recently given by Prof. Wm. H. Brewer, of Yale College, before the New Haven Board of Health:

It is well known that all woods contain certain nitrogenous, organic compounds, known chemically under the general name of *albuminoids*, and that these substances are active in inducing and favoring rot. All chemical methods for the preservation of timber from decay look towards getting this nitrogenous portion into some less soluble condition, or into some combination less liable to chemical change. When green wood is well soaked in cold water, a considerable quantity of such albuminoid matter is dissolved out, remaining in solution in the water. This solution, even when very dilute, is extremely putrescible—more so, indeed, than any person would deem possible, until he had tried the experiment. The fact is as true of the hardest woods, as maple and locust, as it is of soft wood.

To illustrate: If a few pieces of such green wood be carefully freed from bark and all foreign dirt, and put into the purest cold water and let stand at the ordinary temperature of 60° or 70° Fahr., the water soon begins to become turbid or opalescent; this opalescence increases, in two to four days a thin pellicle forms on the surface, active putrefaction sets in, along with an abundant growth of ferments, and the liquid soon becomes peculiarly and pungently stinking. The odor naturally varies with the kind of wood used, but in all cases it is very rank, fully as much so as the same amount of *animal* matter in solution. The intensity and rapidity of putrescence vary, of course, with the temperature, the kind of wood, and the degree of concentration of the solution.

As in the case of other putrefaction, what the gases are which produce the exhalations, we are entirely ignorant. It is probable that they are organic compounds of simpler molecular constitution than the albuminoids which furnished the necessary elements.

If kept long enough, and of sufficient concentration, there is an abundant fungoid growth in the solution, and if kept in the light it grows darker in color, gradually becomes sour to the taste and smell, but continues offensive in odor for a long time; in bottles partly filled, it continues to smell bad for two years. Where the solution is kept in the dark, the odor seems more offensive than if the decay goes on in the light.

In the free air and full sunlight (the condition to which piles and various other wooden structures and vegetable matter in swamps are subjected) along with the putrescence, a white fungus growth begins on the surface of the wood, which rapidly becomes slimy. This forms much more abundantly on the ends of the grain of the wood than on either the radial or tangential sides. If the solution is poured from the wood and kept in a separate vessel, and in the light it grows dark, as already described, but the fungus growth goes on, modified, of course, by the temperature and the degree of concentration, or until the decay has become complete.

If the wood continues to be placed in successive portions of clean water, the soluble matter continues to be extracted for several months, even if the blocks be very small, and the tendency towards putrefaction grows less and less. Finally, however, the soluble matter appears to be removed, the water then remains clear, and the wood ceases to be covered with fungus growth, at least to any visible extent.

Timber, when thoroughly water-seasoned, is known to be very durable, and it is probable that it is so merely because of the removal of the soluble and putrescible albuminoids.

Experiments tried with the same woods in sea water, and in brackish water (made by mixing two measures of fresh water with one of sea water), show similar sanitary results; they are even actually intensified. The turbidity begins sooner in sea water than in fresh; the film on the surface is more abundant, and the smell is more disgusting. Heart-wood and sap-wood act essentially alike in this matter, the difference is one of degree rather than of character.

The suggestiveness of these facts is almost too obvious to need comment, and yet I will add a word. Vast quantities of wood and vegetable matter, decaying in water or in swamps, are too common.

If piles about our wharves and similar structures do not smell so badly, it is merely because the solution is more dilute. The decay goes on, however, and so with vegetable matter decaying in swamps, sawdust in ponds, and so on to the end of a long chapter. The trouble has sometimes been attributed to the obvious gases evolved, notably to light carbureted hydrogen, which one may see bubbling up, with nitrogen and carbonic acid, through the water of ponds, where sawdust, or vegetable matter, is decaying on the bottom. As I have maintained in a paper read at a previous meeting of this association, I cannot believe that either of these latter gases of decay seriously affect health. These latter experiments on woods only confirm the views then expressed.

The exhalations of swamps, or of vegetable matter decaying in still water is universally regarded as unwholesome, in climates where for a part of the year, at least, the wear the is as warm as we have it. So far as I know, there is no exception to this on the whole earth, and hence the general sanitary bearing of the observations here recorded need not be further argued.

Blacksmith's Hammer Signals.

When the blacksmith gives the anvil quick light blows it is a signal to the helper to use the sledge, or to strike quicker.

The force of the blows given by the blacksmith's hammer indicates the force of the blow it is required to give the sledge.

The blacksmith's helper is supposed to strike the work in the middle of the width of the anvil, and when this requires to be varied the blacksmith indicates where the sledge blows are to fall by touching the required spot with his hand-hammer.

If the sledge is required to have a lateral motion while descending, the blacksmith indicates the same to the helper by delivering hand-hammer blows in which the hand-hammer moves in the direction required for the sledge to move.

If the blacksmith delivers a heavy blow upon the work and an intermediate light blow upon the anvil, it denotes that heavy sledge blows are required.

If there are two or more helpers the blacksmith strikes a blow between each helper's sledge hammer blow, the object being to merely denote where the sledge blows are to fall.

When the blacksmith desires the sledge blows to cease, he lets the hand-hammer head fall upon the anvil and continues its rebound upon the same until it ceases.

Thus the movements of the hand-hammer constitute signals to the helper, and what appear desultory blows to the common observer, constitute the method of communication between the blacksmith and his helper.

To Saponify Petroleum Oils.—According to the London *Journal of Applied Science*, the following is the practical mode of operation in the particular case of a refined petroleum: Stearic acid is the fatty matter employed, and, upon being melted, is poured into the petroleum—in the proportion of about 15 parts of fatty acid to 100 of petroleum. After thorough intermixture has been effected by stirring, the mixture may be saponified in the usual way. It is recommended, however, that animal or vegetable fatty matter be added to it before saponification, the result being an improved product, the proportions recommended being two of acidified petroleum to three of fat. Either soda or potash may be used in saponifying, and the soap produced will be hard or soft according to the alkali employed and the proportions taken. The product is represented to be actively detergent, and to be free from tendency to putrefy. We give the foregoing for what it is worth. From the neutral chemical character of the mineral oils, it would appear that the result of the operation just described would be simply a case of mechanical suspension, and not one of chemical union, as in the case of the soaps proper. The process is affirmed to be applicable not only to the native mineral oils, but likewise to such as may be obtained from schist, asphaltum and other sources. The novelty of the process seems to consist in first saturating the mineral oils with a fatty acid, and then saponifying in the usual manner, the capacity for saponification having been imparted by the addition in question.

Good Health.

The Feet in Winter.

Sometimes in washing the feet in warm water a great deal of scurf or whitish soft substance may be scraped from the soles. This is dead skin, dried perspiration, and other accumulations, all resulting from a want of personal cleanliness. These accumulations occur most in winter, when washing the feet is neither as convenient nor agreeable as in summer time. Many persons suffer from cold feet, simply from a neglect to keep them clean. Few suffer thus in summer time, one reason for which is that the skin is moist, the pores are open, a free evaporation takes place, and the blood is invited to the surface. In winter the skin is dry, harsh and cold. To keep them constantly warm and comfortable is indispensable to good health, and to do this the surface must be brought to the condition of summer—that is, must be soft and somewhat moist, instead of being harsh and dry. This may be soon brought about by soaking the feet in warm water for half an hour at a time daily, using most freely a very stiff brush, with good soap. After the skin has become soft and smooth, a good washing with soap and warm water twice a week during cold weather will greatly contribute to a healthful condition of the feet as well as to personal comfort. If the feet are kept unexceptionably clean, and are nevertheless inclined to be dry, considerable benefit will be derived by rubbing into the soles every morning a little sweet oil, 20 or 30 drops to each sole, with the palm of the hand, patiently and well, the object being to secure by artificial means, that softness and moistness which is known to favor evaporation and invite thither the flow of blood. If in addition, the feet were placed in cold water regularly every morning (when not unwell) not over two inches deep, and remaining in not over half a minute in cold weather, then rubbed briskly dry with a coarse cloth, next with the hands, all followed by a brisk walk or stamping for a minute or two, or until they begin to feel comfortably warm after the cold bath, an improvement in the condition of the feet would be secured in a reasonably short time, which would largely compensate for the trouble taken.—*Hall's Journal of Health.*

A daily action of the bowels, says *Hall's Journal of Health*, is essential to good health under all circumstances; the want of it engenders the most painful and fatal diseases. Nature prompts this action with great regularity, most generally after breakfast. Hurry or excitement will dispel that prompting, and the result is, nature is baffled. Her regular routine is interfered with, and harm is done. This is a thing which most persons do not hesitate to postpone, and in the case of riding to town, a delay of one or two hours is involved. This never can occur with impunity, in any single instance, to any person living. This very little thing—postponing nature's daily bowel actions—failing to have them with regularity—is the cause of all cases of piles and anal fistulas, to say nothing of various other forms of disease: fever, dyspepsia, headache, and the whole family of neuralgias. A man had better lose a dinner, better sacrifice the earnings of a day, than repress the call of nature; for it will inevitably lead to constipation, the attendant and aggravator of almost every disease. To arrange this thing safely, breakfast should be had at such an early time as will allow of a full half hour's leisure between the close of the meal and the time of leaving for the cars.

Soda for Burns.—All kinds of burns, including scalds and sunburns, are almost immediately relieved by the application of a solution of soda to the burnt surface. It must be remembered that dry soda will not do unless it is surrounded by a cloth moist enough to dissolve it. This method of sprinkling it on and covering it with a wet cloth is often the very best. But it is sufficient to wash the wound repeatedly with a strong solution. It would be well to keep a bottle of it always on hand, made so strong that more or less settles on the bottom. This is what is called a saturated solution; and really such a solution as this is formed when the dry soda is sprinkled on and covered with a moistened cloth. It is thought by some that the pain of a burn is caused by the hardening of the albumen of the flesh which presses on the nerves, and that the soda dissolves the albumen and thus relieves the pressure; others think the burn generates an acrid acid which the soda neutralizes.

What Smoking does for Boys.—A certain doctor, struck with the large number of boys under 15 years of age he observed smoking, was led to inquire into the effect the habit had upon the general health. He took for his purpose 38 aged from 9 to 15, and carefully examined them. In 27 he discovered injurious traces of the habit. In 22 there were various disorders of the circulation and digestion, palpitation of the heart, and a more or less taste for strong drink. In 12 there were frequent bleedings of the nose, 10 had disturbed sleep, and 12 had slight ulceration of the mucous membrane of the mouth, which disappeared on ceasing the use of tobacco for some days. The doctor treated them all for weakness, but with little effect until the smoking was discontinued, when health and strength were soon restored. Now, this is no "old wife's tale," as these facts are given under the authority of the *British Medical Monthly.*

Pitting in Small-Pox.—Somebody has ascertained the curious facts, in small-pox, that poor people are pitted least, rich people are pitted most, and no classes are pitted under their dress. Poor people have less light in their homes; the rich have plenty of light, and under this dress there is of course less light than in either case. The explanation according to this observer, is a scientific one. The sunlight consists of three primary colors. The red, the blue and the yellow rays have distinct and characteristic properties: the yellow gives light, the red gives heat, and the blue gives actinism. Now, the pus of variolar pustules absorbs, by its yellow medium, this actinic rays, which results in corrosion of the tender flesh at the base, thus leaving pits.

Importance of Sleep.—A medical man, discoursing upon sleep, makes this remark: "One man may do with a little less sleep than another; but, as a general rule, if you want a clerk, a lieutenant, a lawyer, a physician, a legislator, a judge, a president or a pastor, do not trust your interests to any man who does not take, on the average, eight good, solid hours of sleep out of every twenty-four. Whatever may be his reasons for it, if he does not give himself that, he will snap some time just when you want him to be strong."

Temperature of Baths.—A cold bath should not vary much from 75° Fahr.—under, rather than over. A temperate bath is from 75° to 85°; tepid, 85° to 95°; warm, 95° to 100° and over. The temperature of the body, in health, is about 98°. For cleansing purposes a hot bath is most desirable, but should be indulged in only occasionally, and for a very few minutes at a time. A hot bath excites and increases the circulation, a warm bath soothes and tranquilizes, and decreases the pulse.

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The Week.

The cold wave has surged back upon this coast, and still holds ite position, which, with its chilling influence on business movements, has a retarding effect. There is so little being done in the labor channel that workingmen are complaining of privation, arising from the lack of wages, to purchase the necessaries of life. They have had a procession, and have appointed committees to call upon the leading corporations and ask for the discharge of Chinese employees.

There is great dullness in stock transactions, hut conciderable activity prevaile in legitimate mining properties. Capital is seeking investment in well-proven mines; and speculators are securing claims which promise rich returne in the future.

The distress in Ireland is awakening the generous sympathies of our men of wealth, who are evincing their humane eensatione by liheral contributions to the relief fund. Mr. Mackey hae donated $10,000, and the Nevada hank has given $25,000 to this henevolent cause. We hope to see the list of similar gifts largely increased. Our Irish citizens have decided to omit the usual celebration of St. Patrick's day, and instead, to devote the time to an entertainment, the proceede from which are to be applied to the relief of their countrymen at home.

The free fight shooting, which is becoming too prevalent just now, has resulted in the death of a woman in Oakland, who was unfortunately passing near the ecene of trouble and was instantly killed by a random bullet.

The Legislatnre is actively at work, but more time seems to he given to getting up and introducing bills than to deliherate discussion of their merits. Hasty legislation ie to be deplored, and the public would be more satisfied with the work, were due and proper consideration given to the measures propesed.

THE nomination of John M. Morton as Internal Revenue Collector for the San Francisco distriot has been rejected by the Senate by a vote of 42 to 10.

THE Treasnry Department a few days since purchased 375,000 onnces of silver for the Philadelphia, San Francisco and New Orleans Mints.

Fraudulent Representations in Mining.

When any great channel of entsrprise is successfully inaugurated, all legitimats industries accessory to it are dsstined to flow in its course. Thsy are ths sustsining streamlets that supply the current of the channel. It is where they rightfully helong. It is where they should he found. The channel would he inoperative if they were not present. Thsy constitute the arterial hlood, which, flowing through it, imparts life and energy to it. In strict accordance with the lawe of adaptation, they, while there, are in their true sphere.

Bnt fungi will always he found npon the richest soil, and parasitee will ever thrive npon the moet nutritious vegetation. So in all channels of intrinsic value, there will he found schemers and fraudulent designers, who, going with the current, will hold forth illusive projecte to ensnare the unwary, and hy deception and falsehood inveigle their victims into disastrous speculations. If the loss entailed upon the unwary was the only evil arising from their pernicious operations, it, perhaps, would not be much of a matter of regret. It might in the end he a benefit hy inculcating the growth of caution and due investigation. But, unfortunately, such ie the fruit which matures from deceitful transactions. The deception which has led them into losses, to them appears but a natural result of the operations which legitimately helong to the channel upon which they have emharked with their venture. They do not discriminate between the false and the true; overlooking their own credulity and incautiousness they condemn all that is worthy of approhation. They are like the navigator who, lured hy false lights, should anathematize all lighthouses; or like the merchant, who, smarting under an ill-advised speculation, should declaim againet all commercial transactions.

In no field of enterprise are the above remarks more appropriate than in that of mining. Properly conducted mining is not only a legitimate industry hut it is also a profitahle one. Its inducements for the investment of capital are greater in the way of profit than that of any other industry. Unfortunately, many who desire to avail themselves of its henefits are incapahle of deciding hetween true and false statements in mining narrations. Knowing the desire of the many to engage in prosperous undertakings, the schemer ever stands ready to mislead them hy false and glowing statements of the value of mines that are really worthlsss. Their only aim is to possess themselves of the money of those who listen to their lying assertions. There is not a mining district in the world but hears irrefutahle evidence of the false representatione of this clase of men. The result has heen that others who would operate in mines and hring intelligence and capital to aid in their development, are restrained from doing so hy the wails of the losere. As far advanced as miniug is at the present day, it would be still further on the way of euccessful operation, were it not for the result of the frands that have heen perpetrated by these schemers, who have placed lights where they would allure their victims to ruin.

It is the duty of the press to take a bold and firm etand against these artful and dishonest manipulators. Wherever a fraud ie institnted it should he promptly exposed. If the papere in the locality of these mining claims that are so falsely overrated would at once decry the intended wrong they would ultimately reap the benefit of such a course. A few such errors, if allowed to culminate, would at last ruin the reputation and retard the progress of really good mining camps. They would keep capital away and would dishearten and discourage men of enterprise and ability from investing there. If they were checked in their incipiency and put down by just exposure, the evil they would have produced would he averted. A condition of prosperity and success would exist, where, else, ruin and failure would ensue. In the dissemination of the truth, the local journal would have strengthened ite own fonndation; while in ahstaining from telling it, or in aiding in the fraud, it would certainly he weakening and undermining it. For a temporary gain it would establish a permanent evil. The journals in mining camps, particularly, should he like the beacons on the coast, warnings of the dangers to which the venturesome are liable.

NEW MILL IN BODIE.—The new Standard-Bulwer 30-stamp mill started up on Sunday last to test the machinery, and was found to work well in every particular. It was formally opened and etarted crushing ore on the 10th, and, everything proving satisfactory, the structure was turned over to and accepted by the officers of both companies. The mill is the finest in the district.

THE Pacific Mail Co. have announced passenger rates from New York to San Francisco. The rates for passage have been fixed at $75 for first-class, and $35 for steerage. In opposition, the Railroad companies offer the following rates: First-class, $100; second-class, $75; third-class, $45.

IT is reported that 75,000 ehares of Father De Smet etock, Black Hills, have been sold to a company of English capitalists for $1,500,000.

The Dodge Crusher and Pulverizer.

We saw in operation this week at the Union Iron Works, a comhined rock hreaksr and pulverizer, which is the invsntion of Mr. Miles B. Dodge, the machine heing intended to equal in capacity a 10-stamp mill, with any specified size of screen. The arrangement is very simple, and it seems to perform its duty in a satisfactory manner.

The rock hreaker is a No. 2 mountsd on a platform at ths upper end of the casing which encloses the pulverizing harrel, a spout directing the ore crushed hy the rock breaker into the harrel, thus acting ae an ore feeder as well. The rock hreaker is geared direct to the ehaft of the harrel, both running in unison hy means of one helt, hut adapted to he disconnected at pleasure.

The harrel is one of that class of pulverizers in which the ore or cement is pulverized hy meane of halls or rocks. The chamher ie made polygonal instead of cylindrical, the angulated eides overlapping each other, the eides either heing formed of hars of iron with spaces hetween, or of plates. The harrel we examined has six overlapping sides, an opening heing left at each lap.

The crushed ore comes in from the feeder at one end, and the harrel or chamher is rotated, a numher of cast-iron halls being put in it, which grind the ore. While the ore is heing ground up, the material drops off the overlapping edges of the angulated sides past the openings, the ore and halls dropping at each lap.

By having the revolving harrel made with angulated sides, a more perfect and rapid pulverizing action is ohtained. When the chamber ie made like a cylinder, the material simply slides around and is not sufficiently agitated. With the angular sides, however, the material is tumhled over and over irregularly. As one of the sides risee, all that material upon it is snddenly thrown down, and is soon covered and powdered hy the material on the next side, the halle dropping at each lap upon the ore. This dropping action is readily heard when the machine is running. In cylindrical crushers the balle slide in mass, and the ore slides or drags along the inside of the cylinder, wearing out hy friction the hare or grates. In this the halls drop with the ore, and act after the manner of stamps, pulverizing the ore by impact rather than hy attrition. This facilitates the action of pulverizing, and doee not cause so much wear. Mr. Dodge assures us that the ore ie crushed evenly, and no "slimes" (or very little) are produced, which usually cause so much trouhle in amalgamation.

The screens used on the machine to which we refer, are of No. 40 mesh, hut Mr. Dodge considers No. 20 fine enough for gold ores of this State, a statement which he says he will prove to those who hring him samples to work.

This combined crusher and pulverizer is made in snch a manner that the whole can he put up in a few hours after arriving at its destination, and is in fact a complete ore-reducing appliance.

At the Globe Iron Works, Mr. Dodge has one of hie comhined rock breaker and rolls—the same pattern as those of which he has sold so many in Colorado. Thie is simply a rock hreaker, mounted on the same frame with a pair of Cornish rolls, the ore hroken by the breaker being directed to the rolls, where it ie crushed to the size of wheat. The rolls are arranged on elastic bearings, so that a spike or hammer even will pass through withoutinjuring the rolls. The hreaker has jaws of wrought iron instead of hard steel, Mr. Dodge finding this iron preferable. This machine is cheaper than others, and warranted not to hreak. There are a great many of them at work in Colorado, where they are highly appreciated. One has lately heen sent to Virginia City, one to Columhus, Nev., and one to the Mariposa Land and Mining Co.'s mines.

When only one machine is to be used, Mr. Dodge recommends the comhined breaker and pulverizer. When two pulverizing barrels are to he used, he prefers to sell with them, a rock hreaker and rolls, the ore from these passing into the pulverizing harrels.

These machines are set up in running order at the places indicated, and are worthy of examination and criticism by all interested in ore-crushing machinery.

THE MERCURIAL SEPARATION OF SILVER FROM GOLD AND OTHER AMALGAMATED METALS.—In our issue of January 31st we drew attention to the Wiegand Amalgam Refining Process, now owned by the Nevada Amalgam Refining Co., of which the inventor, Conrad Wiegand, at Virginia City, Nevada, ie Superintendent and Manager. It was our purpose at that time to have printed a communication from Mr. Wiegand in relation thereto, and the article was in type. Pressure on our columns, however, forhade. But in to-day'e issue the communication appears. We need only remind our readers that its peculiarity in freedom of etyle is due to the fact that it was written more ae a private letter to us than for print. But instead of culling the facts communicated and ourselves preparing an article, we believe it would he more gratifying to our readers for us to print his offhand letter juet as received and explain its style. We commend his communication, which we have taken the liherty of giving sub-headings to, to the attention of all amalgam producers. It appears under the caption of "Wiegand's Amalgam Refining," on page 92.

Railroad Items.

On the 10th inst. the Nevada Central railroad from Battls Mountain, on ths C. P. R. R., was completed to the city of Austin. This line establishes a new era in the mining industry of Reess river and the adjacent country. This extensive and rich mining country has hitherto lahored under very great disadvantages on account of the difficulties of transportation and travel, and the consequsnt expense of mining operation. But hy the completion of this road it is made one of the most accsssihle and valuahle mining sections on the Pacific slope. Its resources are practically inexhaustihle, comprising mines of gold, silver, copper, antimony, galena, iron and other metals which offer an inviting field to capitalists who desire to engage in mining as a legitmate business. This district of valuahle mining and grazing country occupies the central portion of the State, and will hereafter contrihute largely to its production of the precious metals and its material prosperity. The people of Lander county are juhilant over the completion of the road. This enterprise has heen carried to a successful termination hy a syndicate of New York capitalists, who have shown indomitahle energy in completing the work against apparently insurmountahle ohstacles, caused hy the severest winter known eince the occupation of the country hy the whites. It has reached Austin in contract time, and secures the $200,000 suhsidy voted hy the citizens of Lander county.

The track of the Southern Pacific R. R. is now 23 miles east of Casa Grande, and ahout 40 west of Tucson. From the 2d to the 10th of February, there were 81,900 feet of steel rails laid. The company hope to have the road completed to Tucson ahout the 4th of March. There are at present en route from Pennsylvania eteel raile enough to complete the road to ahout 60 miles east of Tucson hy the 1st of May.

A suhscription hlock of Sonora Railroad stock, projected to run from Guaymas, on the Gulf of California, to the southern extension of the Atchison, Topeka and Santa Fe Railroad syetem in New Mexico and Arizona, was recently sold in Boston for a bonus of $5,000. The last sale was at $350, and it may he interesting to some to know that the same block was sold each time. The first 30 miles of road are to he constructed immediately, heginning at Guaymas.

The removal is announced of the main offioe and clerical offices of the Kansas division of the Union Pacific railroad to Omaha. Only the General Superintendent's and Assistant-General Passenger Agent's offices remain in Kansas City.

The Senate Committee on Corporatione has adopted Beerstecher'e Railroad Commission hill as a suhstitute for all others. It is amended in several respects. As recommended for passage, it fixee the salary of each Commissioner at $4,000; of the Secretary at $2,000; of the Bailiff at $1,200; traveling expenses other than transportation to he paid hy the State. Railroads and traneportation oompanies are allowed to carry the Commissioners and their employees. The Board ie empowered to employ counsel other than the Attorney-General and Distriot Attorney. In case of exigency, all suits to which the Board ie a party shall have precedence over all other business except criminal husiness. Section 11 is amended so as to provide that the fixed ratee of charges shall go into effect on the twentieth day after the same shall have heen posted and a printed copy has been served upon any agent or officer of any copartnership company or corporation at each of the stations, depots or landing places affected. A section was added to provide for the transfer of the property of the Transportation Commissioner to the new Board; also another section providing that the salaries and expenses shall be paid out of the general fund of the State Treasury.

Mining in Maine.

The mines in Maine have been quietly developed by Eastern capitalists for some few yeare past, and under their judicioue management mining has grown into such great proportions in that State that it now holds a prominent rank among the producers of silver and copper. It is evident from the progress made in this direction that henceforth mining will he classed among the leading interests there; and it is not unlikely that the success which has attended this industry, will soon give birth to a spirit of speculation, which has ever been associated with mining operations.

There are nearly 100 mining companies in active operation. The majority of them are in silver oree, the halance in copper.

Private compaies comprise about one-third of the number. The mines are supplied with machinery of the most approved character, and although the shafts have not reached a depth of 800 to 1,000 feet, it is capahle of prosecuting the work at that depth.

Old Californians who have returned to their homes in that section are investing and working in the mines, and their opinion is that the mineral deposits are of immense value.

We gather the above general viewe from the *Maine Mining Journal*, a new paper, which tho interest of the mines has called into existence. It is ahly conducted, is cautious in its expressions, and is a beautiful specimen of typographical art.

Legislative Matters.

Senator Conger has introducced the following bill affecting mining corporations:

SECTION 1. It shall be unlawful for any officer of any mining corporation incorporated or existing under the laws of thie State, to be pecuniarly interested, directly or indirectly, in any contract for the milling of oree, the furnishing of supplies or in the performance nf any work nr any business nf the corporation. Any violation of this sectiou shall be punished by imprisonmont in the State prison for not less than ous nor more than ten years, nr hy a fine of uot less than $1,000 nor more than $20,000, or by hoth such fine and imprisonment.

Another hill introduced hy the eame Senator rogulates the issuance of certificates nf stnck of cnrporations as follows:

All certificates of stock of any corporation incorporated nr existing under the laws of this State, shall he isened to and in tho name of the real owner thereof; or, if isened in the name of a trustee, the certificate muet also give the name of the person for whom the same is held in trust. All certificatee of stock issued in diegard of this section shall be void.

Aseembly bill No. 75, introducod by Gorley, limiting and regulating the sale of mining stocke, has been adopted without discussion hy a vote of 69 to 10. We gave this hill in full in our last ieeue. It prohibits "waeh sales;" makes hrokere give customers written accounts of transsctions and date thereof; prohibits hypnthecating or loaning of stocks, etc. Violation of the provisions nf the act is accounted a misdemeanor, punishahlo hy a fine of not less than $1,000 nor morc than $10,000, and imprisonment in Stete prison for from eix to twelvo months. One nf the speakers, when voting, eaid this hill should be stigmatized as "An act to prohibit men from using their credit."

When the hill came up in tho Assembly, the Committee on Mines and Mining had offered eeveral amendmcute, which were voted down with singular unanimity by the Houee, the committce itself not voting for them. The first amendment was to Sec. 1, to make the purchase or sale of shares in stock boards a misdemeanor instead of a felony.

Gorley said that the hill had caused eome disoussion throughout the State, and wae a just measure. If the hill had heen suhmitted to the Board of Brokers it could not have heen amended in eny way hetter calculated to eatisfy them, then hy the committee. They showed the hand of an expert. There are men who would gladly sink the hill rather than allow one ducat to slip through the fingers of the hoard. Most of them have not seen the misery which he had witnessed. If the business wae conducted honestly, there would he no necessity for the hill.

Felton desired to strike out the provision against hypotheceting etocks. He said thet he weut to the committee aud aseured them that the hill would reduce the mining businese to a mere cash hasis. No other business in the Union was similarly conducted. It would drive away hundrede nf millions of capital. It was a legitimate enterprise, and if properly restricted, should he fostered. To prohibit the hrokere from hypothecating the etocks would put a etop to the business. There are hille here which will properly regulate the business, he thought.

The Committee on Finance and Waye and Meane, reepectively of the Seuate and Assembly, met on Wednesday, Senators Conger, Carlock and Baker, and Assemhlymen Brooke, Cuthhert and Coffman heing ahsent. The Pardee hill was suhstituted for the hill prepared hy the committee, and was considered hy sections, commencing with Sec. 3,628 of the Political Code, which was adopted hy the following vote, which may he considered as a test vote: Ayes—Johneon, Traylor, Ryan, Pardee, May, Downes—7. Noes—Moreland, Brown of Yuhe, Del Valle, Leach, Morse, Hartson—6.

Hertson said that the minority would not interfere with the perfection of the Pardee bill.

It ie understood that the minority, which repreeents a majority of the Aseemhly Committee, will report the committee bill.

Ryan said that if stock was taxed at thie time corporations would resist, and no property of theirs would be taxed.

Pardee suggested the essessment of stock ahove par, as it would he the same thing, there being little ahove par.

After several other amendments, Johnson moved that the Pardee hill as amended he reported favorahly to both Houses, which wae carricd hy the following vote: Ayes—Senators Johnson, Traylor, Sears, Pardee, Brown of El Dorado, and Ryan, and Assesmhlymen May and Downes. Noes—Senator Moreland, Asemhlymen Leach, Morse, Hartson, Brown of Yuha, and Del Vallo. The reports will be made nn Saturday.

In the Senate, Hittell'e bill, relating to removing officers in mining corporations, wae recommitted to the Judiciary Committee, to incoporate the same in the codes.

After a long debate, Senate hill amending section 358 of the Civil Code hy allowing private individuals to litigate the validity of corporations was read a eecond time, and orderod to engrossment.

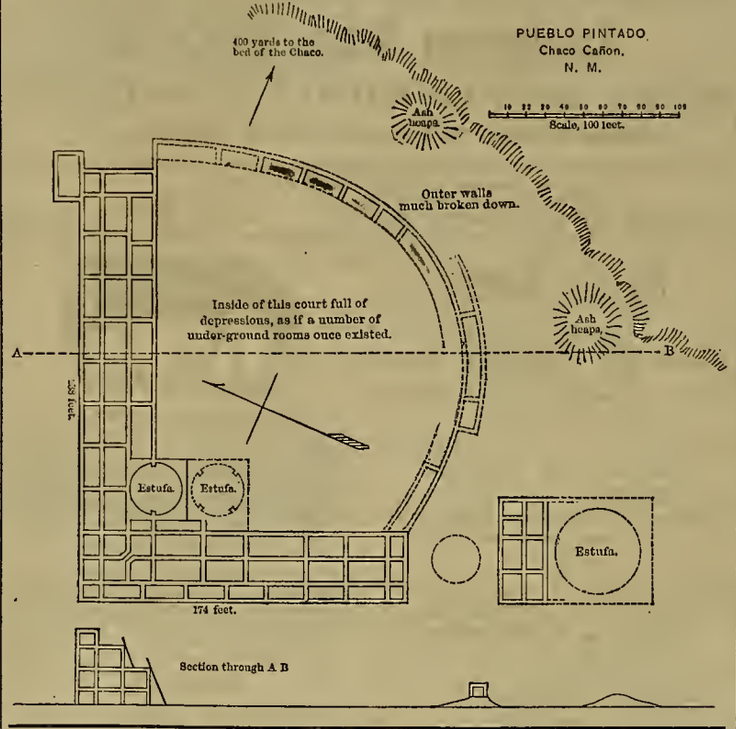
After a long dehate, Chase's hill amending eections 294 and 295 of the Civil Code requiring 10% of the capital etock of corporations to he paid in hefore filing articles of incorporation was indefinitely postponed.

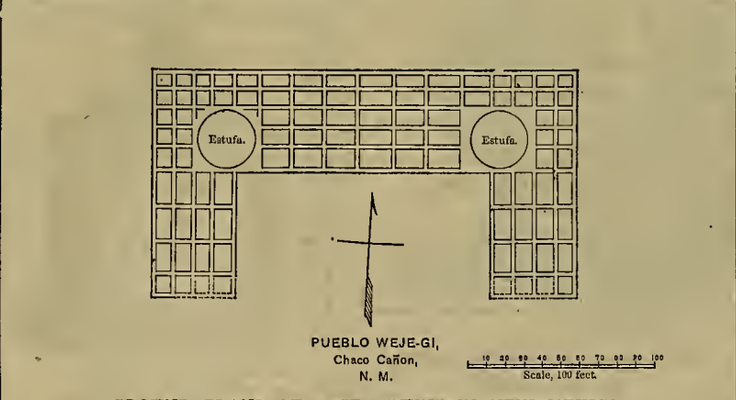
Johnson has introduced a bill enforcing the section of the Constitutinn making direotnrs of corpnrations liahle, and dcclaree nny attempt to ovade its provieion a felony. It has heen reforred to the Jndicisry Committee.

Wsson's hill, amending an act for the protection of minere, provides that where mines are sunk heyond 300 feet in depth, an extra shaft ehall be sunk to connect with the main shaft, es a mode of escapo from nndergrnund accidents; and that all machinery, cahlee, reols, cagee, etc., ehall be kept in perfect ordor and inepected every three mouthe hy a competent person. Failure to comply with the foregoing makes tho company or owners of mines respousihle for all accideuts caused thereby.

Aztec Ruins in New Mexico.

The fame of the Aztec empire has been sounded by poet, novelist and historian ever sinco the vestigcs of their ancient civilizetion first came to the eyes of moderu explorers. Of late years ecicnco has applied its severer methods of analysis to the ruine of their pre-





GROUND PLANS OF AZTEC RUINS IN NEW MEXICO.

hietoric greatness, and though much has heen learned concerning Aztec hahitatione and the minor materials which entered into their life methode, there is much still to he discovered. The latest investigation relating to these matters was made hy the Government Survey of New Mexico, in 1877, results of which have heen lately puhlished. We shall preeent to our readers a few engravings showing the ground plans of the most notahle ruins which were discovered in the Chaco canyon in New Mexico. These ruins are pre-eminently the finest examples of the numerous and extensive remains of the works of unknown huilders to be found north of the seat of the ancient Aztec empire in Mexico, and of which there is comparatively hut little known even in this day.

The Puehlo Pintado, shown in the engraving on this page, is the first run of any extent met in an approach from the southeast. Referring to the ground, which is the result of careful measuremente carried mainly over the floor of the eecond story, it will he seen that the principal portion consists of an L-ehaped huilding, the two wings of which, facing south and east within 20 degrees, measure upon their exterior eurfacce 238 and 174 feet. The extremitiee of these wings are conneoted hy a wall or row of small houses springing in an aroh from one to the nther. Msny of tbe small apartments in this row have their walls so well preserved thet they can he readily messured.

Almoet the entire area of the oourt thus inclosed, approximately 200 feet hy 160 feet, presents a very irregulsr and broken surface, as though it had hecn nearly all occupied hy underground apartments, the roofe of which falling in produced the great deprcesions and mounde which now exist. The two outer walle, which are now standing in placce ahout 30 feet in hight, indiceto an original elevation of at least 40 feet, unbroken by any apertures excepting the emallest kind of windowe. The northeru walle present the largest unbroken surfaco. The northwest corner aud the western wall are much moro broken down. The two interior longitudinal lines of wall in hoth wings ere intact throughout most of their lougth to the top of the eecond and third stories, while the well fecing the court barely extende up into the second story.

Twelve miles from the Puehlo Pintado, and on the north side of tho canyon, are the next important ruins, although therc are several small onee on the way. The Puehln Weje-gi, as Simpson calls it, is situated close under the hluff, and is a rectanguler structure built around three sides of an open court which faces almost due eouth. Its exterior dimensions are 224 hy 120 feet. The walls are still etanding to a considerahle hight, aud indicate at leest three stories. They are huilt in much the same style as those of the Puehlo Pintado, of small tuhular pieces of sandstone arranged with a heautiful effect of regularity and finish. This ruin is remarkable for the perfect symmetry of the arrangement of the rooms and of the *estufas*, a close ecrutiny and careful measurement failing to detect eny deviation. The rooms are small, the largest being 8 by 14 feet, and the smallest 8 feet square. The *estufas* are each 30 feet in diameter, and are placed just within the two elbows of the huilding.

AT 11:30 A. M. on Monday the last spike necessary to complete the hranch of the Atchison, Topeka and Santa Fe railroad to Santa Fe was driven hy Gov. Wallace, Gen. Hatch and eteff, the Legielature and other notahles attending. There is much rejoicing at Senta Fe.

JAMES W. CLAYTON, for fourteen years olerk in the Houee of Representatives, died at Baltimore recently.

The $20,000 Prize for Harvesters.

The lest meil from Austrelia hrought ns files of Adelaide exchanges which contsin reports nf the conteet for the prize of $20,000 offered hy the govornment of South Australia for a comhined reaping and threshing machiue. It is somewhat dieheartening to announce at the outeot that tho contest was only a partial success, eo far as hringing to view a full-fledged and well-working combined machine is concerned. The magnificent prize has failed to secure the objects aimed at in its offering.

There had heen 27 entries for the government prize of $20,000, hut at the roll call only 14 responded and brought forward their machines. Of these there was one from the United States, entered hy S. L. Gaines, of Oregon; the others were of colonial invention. Mr. Gaines was ohliged to retire from the field soon after starting up. His excuse wae that he had lost a pulley from his machine on the voyage, and the smaller one with which he attempted to work would not serve the purpose. The colonial machines did better, and after making their rounde, the grain was poured upon a tarpaulin and examined hy experts. One machine was found to crack the wheet, hut otherwise to yield it clean and in marketahle condition; hut those following the mechine found so much wheat on the ground thet its "saving" qualities were rated low. Another machine, which the reporters decrihe as having the appearance of an "infantine dredger," yielded wheat not eo badly cracked as the preceding, hut it was not eo olean. The third machine to finieh its round produced "very clean grain, with little waste." Tho fourth machine, which is pronounced hy the *Observer* to "stand a chance of distancing ite competitors," was entered hy Mr. Phillipson. It reaped, threshed and hagged the grain, and in "all reepects did its work hetter than any other exhihited."

We shall select, from the list of machines exhihited, one on sccount of its American origin, and othere hecause they succeeded in turning out threshed wheat on the trial field. Mr. Gaines' machine was an adaptation of the Californian header, with a threshing and winnowing attachment. From the header the grain ie thrown hack upon a "draper," or rather three "drapers." Theee are revolving endless hands of canvas; one at eech side carries the heade, which are cut off to a central draper, which in its turn conveys them hack to a thresher, which efterwarde forwarde the chaff and wheat into a winnowing arrangement, where they are separated, the chaff, straw and other ruhhish heing scattered over the field.

The machine which is spoken of ahove as wasting grain was planned in this way: On the "off" side of the arrangement is a Ridley reaper contrivance for stripping the grain and cheff off the straw, from whence it is thrown up into a chute, which conveye it to a winnowing machine, carried upon the "near" eide, one pair of wheels and a very long and etrong axle supporting hoth winnower and reaper. The driver occupies a place with respect to the reeper portion of the machine similar to what he would were the winnower absent; but on the platform, to the left of him, stands a man with a scoop, who continually gathers up the cleaned wheat from a receptacle in the platform heneath hie feet, and deposite it in a hag hung up in front nf him. This labor appeered to he very heavy, and the continual hohhing up and down seemed unsuited for very hot weather. The wheet and chaff is passed through a number of sieves until it is separated into fine wheat and refuse, and at the end of the round the wheat begged by the second men is laid upon the ground, whilst the chaff, chogs and other waste is cleared out of the hody of the winnower.

The machine which did the best work at the trial was made hy Mr. Phillipson, of Victoria. The local report eaye: The grain passes intn the mechine the same as in the ordinary etripper. After paesing through the heatere it falls on to an apron which elevates it to the top of the machine, and whilst it is being carried up it is acted upon by the wind from the front fan, which blows a portion of the chaff out of chimney at top of machine. The grain and straw then fall on to a strew-csrrier which carries away all the rough straw and discherges it at the hack. The grain then falls through a hopper on to the riddles, end while falling is acted on hy the wind from the second fen, leaving nothing hut white heads and drake to he taken out of the wheat, which is effected by the riddlee, the white heads passing out on the off side into a set of elevetore which convey them hack to the heaters to he rothreshed. The clean wheat paeses out on the nesr eide into a set of elevators, and is then elevated and discharged into hags which stand on a platform on near side of machine. The drake falle from the riddles into a hox pleced to receive it. The hags when full are sewn up and tipped on to the ground. The machine requires two men tn work it.

Of the machines which were hronght upon the ground, hut for some reason or other did not start, there were various styles, and they are described as "like a dredger," "a threshing machine mounted on the hack of an ordinary reaper," "like a smutter in a flour mill," "like an emigrant wegon," etc. There was to he another trial in the weck following the one we have mentioned, and the next Australian mail will douhtlese bring the results of it, and it ie to he hoped that something more definite may he attained than wae hrought out at the first trial.

Heat in the Silver Mines.

Those who have never personally inspected the lower levels of our mines may obtain some idea of the degree of heat to be found therein by visiting the Savage works at the change of shifts. The men—packed together as close as they can stand on the cage—are popped up out of the shaft all steaming hot, for all the world like a hunch of asparagus just lifted from the pot. They make their appearance in a cloud of steam that pours up continuously from the "depths profound," and are dimly seen until they step forth upon the floor of the works. As the men land and separate, each carries with him for half a minute his little private cloud of vapor. As this passes off the man is seen to be naked from the waist up, his skin as wet as though he had just been lifted out of a pool of water. The men bring up with them—besides the steam—an amount of heat that may be felt by the spectator as they pass.

All this is at the top of the shaft, where it is considered quite cool—what, then, must it be hundreds of feet below, where the men started from—down where the water stands at 157° Fahr.? Down there no steam is seen—it is too hot for it. It is only when the hot, moist air coming up from the lower regions strikes the cool air towards the top of the shaft that it takes the form of steam. Down where the men come from you must keep your hands off the pump column and the pipes, and if you pick up any iron tool you will at once put it down without being told to do so. Down there they handle things with gloves on, or wrap rags about the drills they are guiding and iron apparatus they are moving; and down there, too, you will learn to keep your mouth shut after you have drawn a few mouthfuls of hot air into your lungs. Perspire? It is no name for it. You are like a sponge that is being squeezed. You are ready to believe that you have 10,000,000 pores to every square inch of surface, or as many more as any authority may mention, and that all these pores are as big as the cells of a honey-comb. You go for ice water, and it almost seems to hiss as it passes down your throat—you keep going for it, and thus, in a short time, find out what becomes of the tons and tons of ice that are daily consumed in the mines. Remain below among the miners for an hour or two, and when you are finally popped out at the top of the shaft, all red hot and steaming, among the other asparagus sprouts, you will appreciate the beauty, the light, and the coolness of the upper world.—*Virginia Enterprise.*

THE number of men available for military duty in the United States is stated by the Secretary of War to be 6,516,758.

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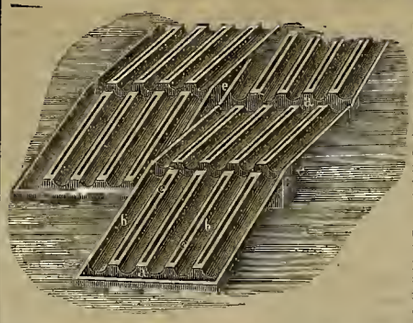

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All communications should be addressed to "MINERS' ASSOCIATION," No. 320 Sansome street, Room 23, San Francisco, Cal.

DISSOLUTION OF COPARTNERSHIP.

The partnership heretofore existing between George Spaulding and Solon H. Williams, in the city and county of San Francisco, under the firm name of Spaulding & Williams, is this day dissolved by mutual consent.

George Spaulding alone is authorized to collect the outstandings and accounts, and will pay all claims against the late firm.

GEORGE SPAULDING,
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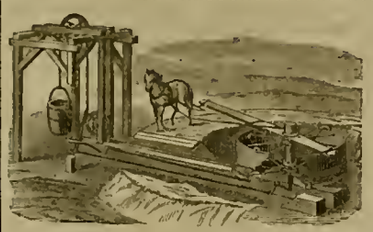

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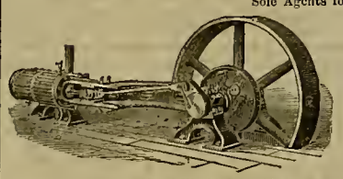

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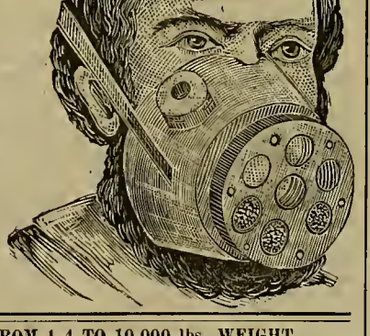

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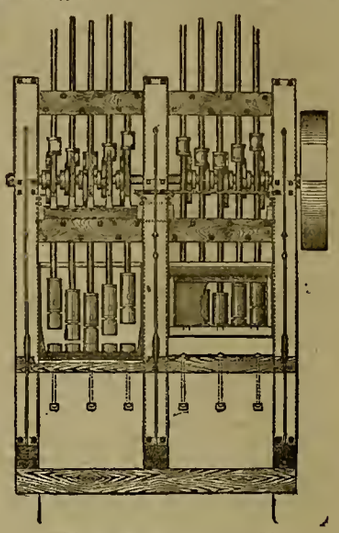

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A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Hueme, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Mecker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

Mines and Works of Almaden.

Translated from "Annales des Mines"
BY S. B. CHRISTY.

Full geological description of this famous Quicksilver Mine, illustrated by maps and plans of the works. Complete description of the Quicksilver Furnaces and Condensers, etc. 48 pages octavo—paper cover—price (post-paid) 50 Cts. Published and sold by DEWEY & CO., 202 Sansome Street, S. F.

[CONTINUED FROM PAGE 101.]

working ordsr. They have now running No. 1 and No. 2 on ore, and No. 4 ou refinery by-products and purchased ore.

DUNDERBERO.—The contractors have stopped the 500-ft west crosscut; total distance from the station, 123 ft. Five hundred-ft south drift ground continues very hard. During the week the ore vein had almost entirely disappeared, but looks much better to-day. The ore vein is about 18 inches wide, and looks very promising. The new crosscut above the upraise from the 400 level, referred to in my last, has advanced 30 ft, and expect to cut the ore from the upraise in about 10 ft more. The drift above the 400 level still continues in low-grade ore and vein matter.

BELLWHACKER.—Have shipped ore as per returns, and have about 15 tons still at the mine, which will be sent down in a few days, together with whatever more we get out by the end of the month. The stopes from which we are taking this ore look much the same.

RUBY.—The lode in the crosscut, in the intermediate level between the 400 and 500 levels, is reported to he two ft wide of good ore.

EUREKA CON.—First level—East drift in 159 ft. Third level—West drift in 61 ft. Seventh level—Northeast drift in 94 ft; south drift in 145 ft; north drift in 80 ft. Eighth level—South drift in 44 ft. Tenth level—East drift in 117 ft. Eleventh level—East drift in 71 ft.

K K.—Wednesday last shipped 150 tons of high-grade ore to the Richmond works for reduction.

SILVER CONNOR.—Mr. John S. Capron showed us yesterday one of the finest specimens that we have ever seen taken from this district. It showed a large amount of free gold and silver. The company has 20,000 tons of ore in sight that has not been touched.

BRISTOL DISTRICT.

OHIO.—Pioche *Record*, Jan. 31: Has made a valuable strike. Tho work has heretofore been on a spur to the west of the main ledge, believing that they were on the right track. About a week ago they were led to work to the east of the old works, when the main ledge was struck and a large body of ore was uncovered. This company will erect a water-jacket furnace and a mill, as they have both smelting and milling ore.

ARIZONA.

COPPER MT. DISTRICT.—From a private letter from Clifton, Jan. 20: It may be of interest to you to know something of the mining interests and prospects of this portion of the country. We are in the Copper Mountain mining district, which was opened up by the Lezinskys in working the celebrated Longfellow copper mine—north of the Gila river, between the Frisco and Eagle rivers. The district has heretofore been worked for copper, but is now being more thoroughly prospected, and proves not only to be very rich in copper, but in gold and silver also. The copper belt seems to lie in the center, on what is known as Chase's gulch, where the Longfellow mine is located, and is very rich in copper. North of that is the Gold camp, where very rich gold quartz, placer and hydraulic mines are worked. South of the copper belt, where I am, on Gold gulch, placer mines have been worked for years by Mexicans with considerable success. Now we find extensive quartz leads carrying gold, silver and copper; but we think the silver will predominate, as all assays show more or less of that metal, although I have taken out gold rock that went over $10,000 to the ton, some samples of which I sent to my brother in Los Angeles. Our camp is new, and but little work has been done; but with $10,000 gold, from 40 to 250 ounces silver and 30% copper, we feel very much encouraged, as all the lodes seem to be deep and permaneut. We think all we require is time, a little capital and hard labor, to develop ono of the richest mining camps in the United States.—J. E. E.

MONTANA.

PENOBSCOT.—Helena *Independent*, Jan. 22: We learn from advices received from Capt. Ryan that this mine is opening out in the lower workings and looks especially promising in the old bonanza shaft, where the vein is 15 ft wide. For the last 30 ft the ore body has been 15 ft thick, and is said to carry two ounces of gold to the ton. Sixty ft west of this shaft a winze, now down about 55 ft below the 200 level, has passed through good ground all the way, some samples of the richest carrying as high as 40 ounces of gold to the ton.

BLACK SWAN.—This mine, situated a mile above Unionville, near Oro Fino gulch, is now attracting a great deal of attention. It was discovered by the Spragins brothers and has been developed by them into a first-class bonanza. During the last summer 208 tons of unassorted ore from the eight-ft vein of the Black Swan were crushed, which averaged $20 per ton. They are now running a tunnel which, when completed, will tap the vein 160 ft from the surface.

BELT MOUNTAINS.—O. I. Olingsr, one of the discoverers of the silver mines located in the Belt mountains, about 60 miles from Benton, has brought in some very fine specimens of ore, which assays from 100 to 600 ounces per ton. These mines were discovered in December last, and are known as the Barker mining bonanzas.

ROCKY MOUNTAIN.—This late discovery is located on the west side of McClellan creek, about two miles east of the Bonanza Chief, in Jefferson county, and is a very promising silver lead. It has a four-ft crevice, and samples of ore, recently assayed at the United States Assay Office in Helena, were found to contain 333½ ounces of silver to the ton, and also a trace of gold.

WHEATLAND.—Ths breast of the drift carries three ft of ore and gangue, consisting of iron pyrites, copper pyrites and black oxide of copper. Galena is coming in in small quantities. Assays have run as high as eight ounces of gold per ton, 67 ounces of silvor and 9% copper.

BAXTER.—There are over two ft of ore in the lower level, 130 ft below ths level of the Diamond tunnel. The crosscut on the 220 level bas just cut the north vein, and drifting will be at once commenced.

MOUNTAIN BOY.—Butte *Miner*, Jan. 24: Two hundred tons of ore, carrying 90 ounces of silver per ton, will soon be shipped to the smelter from this mine.

VOLUNTEER.—In the bottom of the main shaft tho ledge formation is about 12 ft wide, eight ft of which is free milling and four ft black ore carrying considerable manganese. A lot taken from the body of free ore, not sorted, hut shipped as it came out, milled between 40 and 50 ounces in the Silver Bow mill, and 90% of the assay value was saved. A drift has been run east from the bottom of the shaft on the ledge, the face of which shows about seven ft of free ore and two and one-half ft of black or manganese ore.

MAXIMILIAN.—The ledge on this mine is narrow but high grade. The shaft is down 55 ft following an ore body varying in width from 12 to 30 inches. From the hottom a drift has been run east on the ledge 110 ft, where the ore body is wider, being from two to four ft, but not so rich. The drift west from the bottom is in about 75 ft, and the face shows a streak of high-grade free ore.

CARLOTTA.—This mine adjoins the Maximilian on the west. The shaft is down 60 ft, following the same chute of rich ore encountered in the adjoining claim. The east drift from the bottom is in about 65 ft, the ledge in this drift running from eight inches to two and one-half ft in thickness. The intention is to make connection with the west drift from the Maximilian, the two mines at present being run in conjunction. This will greatly facilitate their working.

ITEMS.—The inclemency of the weather compelled the suspension of work on the John Haney. At the Lena they are drifting east and west from the bottom of the shaft. The ledge at present is somewhat broken. The Nettie is panning out its usual quantity of high-grade free ore. The ore body in the crosscut from the bottom of the Gray Rock shaft is looking finely. Nothing new or startling to report from the Alice. They aro taking out considerable fine-looking ore at the Moose. Water compelled the Shannon to shut down for the winter. The Buffalo is looking well; showing some rich ore and a great deal of low grade.

THE W. B. ASTOR.—Helena *Independent*, Jan. 22: This valuable mining property is situated on Democrat mountain, two miles from Georgetown. The adit level, which is 1,000 ft long, has been shot out its entire length to nearly 8x7 ft in size, and an engine chambsr 30x30 ft, and averaging 25 ft high, has been excavated at a distance of 800 ft from the north of the adit and 200 ft from the surface of the mountain, vertically. The entire average of the grades of ore—not including concentrating or dump ore, which averaged nearly $100 per ton—for eight months was within a fraction of 500 ounces per ton. The tunnel was run in on the south wall for the first 400 ft, and in that distance shows but little mineral. From that point a crosscut was run for the north wall, a distance of 50 ft, cutting a fine body of mineral, and from here on to the engine chamber and 150 ft beyond, the adit is continued on the north wall. Stope No. 1 commences at the crosscut and is carried 30 ft in hight and 125 ft in length, showing ore all the way. In some places there are eight inches of solid ore that mills 350 ounces. This stops is now being worked. No. 2 stope is 75 ft further west. This is 50 ft long and 30 ft high. Five ore was taken out here, leaving a good show of high grade. Directly under the stope, on the tunnel level, the ore streak widens to 18 inches; six inches of this running 3,300 ounces of silver per ton, and the remaining 12 inches, which carried a considerable proportion of rock, milled 500 ounces of silver per ton. Stope No. 3 is opened for about 100 ft in hight and a like distance in length. This stope has yielded large quantities of unusually rich mineral, four lots of ore, all more than ton lots, yielding 1,466, 974, 609 and 860 ounces of silver per ton. No. 4 stope, adjoining the last named on the west, has been opened a distance of 50 ft in length and 40 ft in hight. This is now being worked and shows as much as 18 inches of quartz and ore, a lot of more than a ton, milled a few days ago, y elding silver at the rate of 589 ounces per ton without classification. The deep shaft is now about 70 ft below the level of the tunnel, and 270 ft from the surface.

IDAHO.

SHAW'S MOUNTAIN.—Boise City *Statesman*, Jan. 24: Mr Walter Coffin, one of the lucky owners in the Paymaster mine, situated on Shaw's mountain, was in town yesterday. There are a large number of specimens from the mine on exhibition, which are very rich in free gold. The ledge is now thoroughly opened and bids fair to be one of the best mines on the range. This and the Sunrise mine, in the same district, will both be ready to turn out a large amount of ore during the coming season. The ore from both mines will average at least $100 per ton. Thess mines, and several others in the same district, are near the Idaho City stage road, and from 10 to 12 miles from this city.

DEEP CREEK.—Idaho City *World*, Jan. 23: Rich quartz mines have been struck on Deep creek, a country very little prospected and lying about 35 miles westerly from Salmon City.

UTAH.

WASCO.—Salt Lake *Tribune*, Jan. 23: This mins has paid from the top down, and still shows a body of good pay ore in the bottom. Work was some time ago suspended on account of bad air, want of machinery, and the low price of lead. The character of the ores in this mine is carbonate. Assays show 45% lead and 40 ounces silver.

MAGNOLIA.—A new strike has been made near the town of Shauntie, by Daniel McNamarra, called the Magnolia. It is the finest kind of smelting ore, going high in silver, and 60% lead.

CONTACT.—A new strike in the Contact is creating some excitement here. This claim is situated near the celebrated mountain Queen mine, in old Pruess district, six miles west of Frisco.

CAVE.—The Cave mine is shipping 20 tons of ore to Frisco per day. Fine bodies of high-grade ore are constantly being encountered in this mine. A working force of 20 men is employed upon it. It still increases in size and richness.

HORN SILVER.—The Horn Silver mine is running two stacks steady under the management of Frank Fohr.

MINING NOTES.—In North Star a fine body of ore has been developed in the Osceola, also in the Hidden Treasure, Burlington and Bell Flower. Considerable work is being done in and around Star district upon a number of mines. In the Foothill camp of Star district, five miles from the end of the gaded part of the Utah Southern extension, and five and a half miles from Millford are some very promising claims. The Golden Era, Ariel, Vicksburg, Minnesota, Liberty, Esmeralda, Cortege (gold), Vulcan, Day Dawn, Hope, Blue Jacket, Apex and many others, all showing ore, and work progressing on most of them. Lincoln, Bradsbaw and other adjoining districts are looking up. Rocky district is now showing up a fine body of copper ore. And the same district bas been yielding large quantities of iron ore for flux.

Present Ventilation of the Comstock.

The Comatock mines, from end to end of the lode, are now better ventilated than at any time since the depth of 1,000 feet was reached in them. The aystem of air connections is so perfect that in all the principal galleries of the lower levels is found quite a brisk breeze. We hear hut little complaint about the heat at the present time. Next the miners will be growling about the cold and will be obliged to work in overcoats and mittens. The lateral drifts of the Sutro tunnel will constitute a great underground river of pure air running through half the length of the lead at a depth of 1,600 feet. The air in this great gallery will be kept pure and brisk by the many connections with large vertical shafts, with the main Sutro tunnel and with the numerous drifts and crosscuts tapping it at various points along its course. Below this is the great north-end air gallery running from the C. and C. ahaft by way of the Ophir to the Union shaft. This ia at a depth of 2,000 feet below the surface. The mines are now so arranged that they can be worked at any depth that may be required, so far as a supply of air is concerned. It will only be necessary to keep up connections with the present system of galleries and shafts. Air may thus he carried to the center of the earth; hut as regards the bringing out of the water, that is another question. However, a way to manage it will he found. At one time in the history of the Comstock we were in just as much douht about our ability to ventilate the mines at great depth, hut we now find that we have only to make proper openings and the air will go down to the lowest points; circulate through such galleries as may he prepared for it and presently come to the surface at a point to which it is led in order that it may escape. Were two shafts sunk to the depth of 10,000 feet the air would rush down one and up the other in case of their heing connected at the bottom hy means of a drift. The greater the depth at which such connections are made the stronger the rush of air that passes through them. This is plainly to he seen at the Belcher mine, where a depth of 3,000 feet has been attained.—*Territorial Enterprise.*

The Hofmann Patent.

EDITORS PRESS:—It was hardly to he expected that Mr. Kustel would willingly acknowledge the paternity of those tailings, the assay of which tells so heavily not, in my view, against his metallurgical skill, hut against his perhaps hastily sxpressed opinion. I frsely confess that I have sometimes heen ohliged, much against my will, to leave as much in my tailings.

As I seem to hs the only person, hesides Mr. Kustel, who has treated gold-hearing sulphurets at these works, and as Stswart's copper ore tailings are easily distinguished hoth hy minsralogical and *stratigraphical* featurss from the othsrs, there is not much room for douht. But let that pass; I have no desire to press the point. The question at issue is as to the propriety of granting a patent on the so-callsd Hofmann process.

I will ask Mr. Kustel, in all sincerity, if I were to rs-treat, hy common amalgamation, ths ore which I have already worked hy the Plattner and Kiss processes, would that constituts a new process or a patentable *invention?* And if not, why not? And if so, ws havs only to take the number of known processes for the extraction of gold, silver, copper, lead, zinc, antimony, arsenic and sulphur, all of which frequently occur together, and comput, hy the ruls of permutation, the numher of different "combinations" that may he made, in order to form a faint conception of the numher of patents which we may expect to see granted shortly, in which case I should pity ths patent department.

Why did not Kustel and Hofmann patent the Plattner-Patera combination tsn years ago? It may he impertinent to ask this, yet under the circumstances it is natural.

I have no animosity against either of the gentlemen concerned in this question, and am willing to pay anyone for a really new and bensficial *invention*, hut I do ohject to having my adopted profession trammeled hy frivolous patents; and I must say that Hofmann's "combination" pressnts itself to me as one of those "ohvious suggestions of common senss," which a metallurgist of his ahility would have heen ashamed under the circumstances to overlook, sspecially after having worked the "Kustel and Hofmann process."

I am doubtful of the advantages of the Hofmann method in many cass to which Mr. Kustel thinks it applicahle. I have tried it (in ths laboratory only) on ths Murchie sulphurets, which are rather rsfractory under ths other treatment, without success, though I admit that the proof is not conclusive as it was only done once, and steam was not used in the roasting. But I have made over 20 trials of ths tailings, with and without re-roasting, hy every conceivahle "combination" of these processes, and I cannot get 50% of what they contain, yet it may he that steam roasting with low heat, in the first place, might have made a differsnce.

Touching the extraction of gold hy the Patsra process, I am at a loss to understand what Mr. Kustel meant hy his "most important diffsrence" hetween that and the Kisa. It is scarcely to he douhted that the gold in my experiment was a chloride; not the Au Cl_3 of the Plattner process, aince it was insoluhle in water, hut that lower chloride which Mr. Kustel speaks of in one of his hooks as being soluhle in the hypoaulphites, and which it is possihle to make in the frnace. It is not likely that metallic gold could he so qnickly dissolved hy sodium hyposulphite, though it may possihly he soluhle in that menstruum, as I know it to he in cyanide of potassium solution when exposed to air—and as I have read that it is in solutions of the alkalies, hut under what circumstances does the "Kiss procesa extract gold where the Patera does not?" This is the point on which several of us are anxiously awaiting "more light."

C. H. AARON.

NOTE.—My sign of interrogation was a mistake, it was meant for a sign of admiration, or rather astonishment at the weakness of the defense, and the still greater weakness of the counter attack made by Mr. Kustel, which made me think Hofmann might well cry "save me from my friends!" C. H. A.

Mr. Deetken's Answer.

EDITORS PRESS:—Not to let this Hofmann process controversy verge into a war of words, Mr. Kuatel is allowed to continue to puzzle his friends without my assistance, whether I claim its use since 1866 or 1876. Perhaps hy cleaning his spectacles he will sucoeed in unraveling the mystery so definitely expressed in my firat answer.

Mr. Kustel scouts at the idea of ever having looked at my "fixings," as he atyles my system of apparatus. Does he think there are no men of common sense who can see the wide difference hetween the apparatus in use in the chlorination works of this State, and those which existed for a short time in Europe? The largest and most skillful operatora in California differ with Mr. Kustel, and have paid me in full for my claims. But Mr. Kustel is not judge and jury in this case.

Mr. Kustel condescends to admit that he consented to puhlish my practice for the aole purpose of introducing me, the young novice, to the mining puhlic—an insolent and arrogant assertion, well knowing with what reluctance I consanted to his proposition of publication sure to he against my interest. Think of the philanthropic plagiarist, rushing to Grass Valley, paying his stage and hotel sxpsnses for ths sole and noble purpose of assisting and protecting a struggling innocent, who had made a record for himself years hefore even knowing of Mr. Kustel's existence. Shades of Emperor Norton I, redivivus, protector of innocents ahroad!

In regard to Mr. Kustsl's statement, that Mr. Beseler instructed me in the chlorine process originally, I have simply to remark that, to use a mild term, it is false.

The facts, are the following:

In the winter of 1858, Mr. Oscar Maltman, of Nevada City, and myself formed a co-partnership to erect works for ths purpose of workiug sulphurets for gold and silver by matting—the process now followed in Colorado. I give Mr. Beseler the credit of inducing me to give Plattner's process a trial at our works. The process was well-known then as a laboratory process, and described in his hlowpipe treatise. We procured a copy of the fourth volume of Kerl's Metallurgy, which gives a more detailed account of the Reichenstein practice.

I startsd in with Mr. Maltman to experiment at Nevada City, while Mr. Beseler shortly afterwards, in partnership with Mr. Ott, the old Nsvada City asssayer, tried his skill independently at Melville Attwood's mill, at Grass Valley.

We both failed to get satisfactory results. Mr. Beseler, though a graduate, as Mr. Kustsl says, of a mining academy, could accomplish no more than the polytechnic novice. Mr. Beseler got discouraged and left Grass Vallsy leaving Mr. Ott to settle hills. On my return from Washos in 1860, I took up ths subjsct again, and in connection with Mr. Maltman's energy we succeeded. These ars the facts in the case, and they can easily hs suhstantiated.

G. F. DEETKEN.

San Francisco, Feh. 10, 1880.

Another View.

EDITORS PRESS:—I have heen much intsrsstsd hy ths discussion now progressing in your paper touching the Hofmann process, which two of your correspondsnts seem to regard as unworthy the protection of a patent. Giving thsse gentlemsn full credit for honest motives, it nevertheless occurs to ms that possihly they do not take a correct view of the mattsr.

It appears that the ore on which Mr. Hofmann opsratad was auriferous, and that the gold it contained could not he extracted hy the Plattsr process "pure and simple," even aftsr ths ordinary course of preparation hy roasting, owing to ths presence of othsr mstals.

That one of thess other metals happened to he silver, also valuahle, is nothing to the purpose.

Regarding the matter in this light, the silver becomes simply an impurity, the same as the lead and zinc, tbe removal of which was necessary to ths successful applicatiou of ths Plattner process, and any means which effscted that end is a valuahle *improvement on the Plattner process.*

That this means shonld at the same time he made aubservient to another purpose, that thia one substance among several which obstructed the action of the chlorine on the gold happena to he itself a valuahle product, only provea the ingenuity of the metallurgist who hit upon so admirahle an expedient, and surely does not militate against the value of the invention any more than would tho utilization of the snlphur which ia exnelled in the roasting, and which ia also an impediment to the Plattner proceas; and it cannot he questioned that if the elimination of the sulphur, *as a means of preparing the ore for the Plattner process* were new, it would he a patentahle improvement, even though sulphurets had heen roasted hefore for other purposes, as for instance, making sulphuric acid.

METALLURGIST.

A MERITED COMPLIMENT.—A short time aince Mr. J. S. Phillips, M. E., presented to the California Academy of Sciences a copy of the new edition of his "Explorers', Miners' and Metallurgists' Companion." This heing a Californian literary production, it was given to a committee for examination. At the last meeting of the Academy, Dr. A. B. Stout reported for thia committee. He highly extolled the hook, speaking of it as in every sense a practical, carefully written treatise on the subjects to which it is devoted. He called particular attention to the soundness of the views expressed in the preliminary chapters, with relation to the formation of the earth, and to the careful and lucid manner in which the novel theories advanced hy the anthor were explained. His remarks on the more practical portion of the hook relating to assaying, prospecting, testing, etc., were highly complimentary to the author. The work as a whole heing commended as one of the few complete teohnical treatises puhlished in this State, and relating specially to the indnstry which made California what she is, was one which should he in the hands of all minera and metallurgists on the coast. Dr. Stout also highly commended the various apparatua for prospectors' use in assaying, etc., invented hy Mr. Phillips and described in the hook, he having examined the appliances and seen assaya made with them.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING FEBRUARY 3, 1880.

224,121.—OPERATING GATES—H. Allen, Silverton, Ogn.

9,661.—ORE STAMP FEEDER—T. A. Cochran, San Francisco (reissue)

224,153.—VELOCIPEDE—P. L. Davis, S. F.

224,081.—AIR COMPRESSOR—W. R. Eckart, Virginia City, Nevada.

224,087.—CRUSHING AND AMALGAMATING MACHINE—L. Haight, Sonora, Cal.

224,108.—MEASURING FAUCET—W. M. Sack, Oakland.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

HAY UNLOADER.—Jerry Tyler, Milford, Lassen Co., Cal. Patented Dec. 30, 1879. No. 223,082. The methods ordinarily employed for unloading and stacking hay and grain are: First, the employment of two-part nets, which lie in the wagon to receive the load. These nets are elevated bodily with their load by the aid of a derrick, and swung around to the place of deposit, when the fastenings are unlatched and the net allowed to part and drop the load. The second consists in connecting one side of the wagon net (which is made entire) with an unloading rope and pulleys, so that the load is rolled out of the wagon instead of being lifted, and thus much power is saved which was used in the first described method to lift the load. This method, which will serve to unload grain upon the table of a threshing machine, or upon a low platform or stack, cannot be employed to advantage in filling a barn or in building high stacks without the aid of other apparatus. This invention consists in the employment of a mast or support, having pulleys and hoisting ropes which are operated by a windlass, in combination with a continuous wagon net, which is adapted to receive the load, and which may be connected with the hoisting ropes when the wagon is brought to the barn or place of deposit, so as to roll the load up to any hight desired without undue friction or pressure upon the side of the barn or stack. In combination with this, rollers or pulleys are employed, which are connected with the inner edge of the net, and by which sufficient tension may be brought upon the net to prevent the overturning of the wagon by the action of rolling the load out. By this construction, stacks may be built with a comparatively narrow base and very high, so that they present but a small area to be protected from the weather.

STEAM GENERATOR AND SUPERHEATER.—John B. Ward, 202 Sansome street, San Francisco. Patented Jan. 27, 1880. No. 223,825. This invention relates to an improved steam generator and superheater; and the improvements consist in mounting in the fireplace of the boiler a superheating or generating cylinder or chamber so constructed as to answer either the purpose of generating or superheating the steam as desired. This chamber is so connected with the interior of the boiler by pipes that at each stroke of the piston of the engine a supply of steam is admitted to the superheating chamber, in which it spreads in a thin annular sheet in such a manner as to admit of all the watery particles being immediately converted into dry elastic steam; but before being so highly heated as to injure the valves by burning out the lubricants, it is discharged into the engine cylinder. The chamber is of a proper size to hold about as much steam as the engine cylinder will take for each stroke, and at each stroke of the piston a fresh supply of wet steam fills the space in the chamber vacated by the dry steam, which has entered the cylinder.

SULKY PLOW.—Issac Burke, Sacramento, Cal. Patented Jan. 27, 1880. No. 223,881. This plow consists in a novel construction of the axle beam or tree, which has a box or guide formed with it, so that the vertical L-shaped standard, which serves to hold the plows in the ground is acted upon directly by the weight of the machine and driver, and as it is centrally situated, it is not affected by the vertical motion of the pole. The improvement gained by the L-shaped standard is, that the standard passes up through the box upon the axle, so that while its projecting arm allows the application of the required pressure upon the plow-beam at the exact point desired, this pressure is applied directly through the axle by means of the weight of the driver and the machine.

COAL-OIL COOKING STOVE.—W. H. Wiester, S. F. Patented Jan. 27, 1880. No. 223,829. In this invention the improvements consist in the application of a single-sheet extension or heating plate to the top of the chimney in such a manner that when not in use the plate will not be heated, but when it is necessary to heat this plate to keep articles warm, the heat will be deflected so as to heat it from below without in anyway affecting the draft.

News in Brief.

A TERRIBLE famine prevails in Mesopotamia and Kurdistan.

THE United States last year sent to Europe 1,500,000 hides.

ALL the iron mines in New Jersey are being worked thoroughly.

SENATOR LAMAR has nearly recovered from his recent severe illness.

THE death of Lieutenant-Governor Chandler, of Kansas, is announced.

THE cotton crop of Brazil is estimated at 4,250,000 bales this year.

THE town of San Rafael, Lower California, has been captured by Marquez.

A SILVER mine has recently been discovered in Garrett county, Maryland.

SHAVAUX, one of the Ute "war chiefs," favors the policy of Secretary Schurz.

CAPITAL punishment is to be re-established in the Canton of Appenzol, Switzerland.

THE lead mines near Phœnixville, Pa., idle for 22 years, are now being worked.

THE College of Propaganda at Rome gives 7,000 lire for the relief of the Irish.

A RUPTURE is said to be imminent between Chile and the Argentine Confederation.

DAVID STANTON, of England, is now the champion bicyclist of the United States.

JUDGE HUNTINGTON, formerly of the Court of Claims, died recently at Hartford, Conn.

MARTIN KING fell 400 feet in a mining shaft at Bodie, Saturday, killing him instantly.

EXPORTABLE wheat in Australia and New Zealand this year will aggregate 375,000 tons.

NO appointment to succeed Indian Commissioner Hayt has yet been determined upon.

THE Supreme Court of Georgia has denied a new trial to Cox, who murdered Colonel Alston.

THE combined length of new railroads projected in this country during 1880 will be 9,000 miles.

A LAHORE dispatch announces that Mahomed Jan is re-enlisting Shere Ali's Aigindah regiments.

THE State prison of Kentucky is reported by an investigating committee to be in a shameful condition.

THE foundation of the East Beacon lighthouse, Sandy Hook, is said to be washing away.

THE investigation in regard to the colored exodus from the South is still in progress at Washington.

THE German budget places the amount of revenue and expenditure this year at 544,888,184 marks.

GEORGE W. SMILEY, of San Francisco, has been elected to the position of Chairman of the new Mining Board in New York.

IN the suit of the Government against E. J. Baldwin for alleged violation of Internal Revenue laws, the defendant was found not guilty.

THE Irish residents of San Francisco have decided to have no parade on St. Patrick's day, but to get up an entertainment, the proceeds of which are to be devoted to the relief of the sufferers in Ireland.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.]

WEDNESDAY M., February 11, 1880.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 5
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 8
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	18 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	— @— —
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	5½@— 6
Bar	— @— 6
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 2 10
Buck, " "	— @ 2 30
Chilled " "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	10½@ 11½
10x14 I C Cooke	10 @ 10½
Banca Tin	— @— —
Australian	24 @— 25
I. C. Charcoal, Roofing 14x20	10 50 @11 00
" " " " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	10½@— 11
NAILS.—	
Assorted sizes	3 50@4 50

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Fourth (24th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 29th day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

Butte Hydraulic Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Poirson	13	2½	$25 00
L Lapierre	22	2½	25 00
H Marcoux	24	2½	25 00
J B Lussier	25	2½	25 00
John Britt	20	2½	25 00
Geo W Deitzler	37	5	50 00
N Desautelle	41	2½	25 00
Jos Lucier	42	2½	25 00
N Goldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervais	45	10	100 00
Geo Moreau	40	5	50 00
Geo W Deitzler	47	15	150 00
A S Hawes	17	10	100 00
J Callandreau	4	10	100 00
A M Wilder, Trustee	1	10	100 00
A L Longfeld	5	5	50 00
L L Dennery	6	5	50 00
W E Lutz	7	5	50 00
Geo. H. Powers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francisco California, on Monday, the 22nd day of December, 1879 at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L DENNERY, Secretary.

Office, room 3, No. 220 Sansome St., San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock of the Butte Hydraulic Mining Company is postponed to the Fifth day of January, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock is postponed to the second day of February, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

San Francisco, Cal., January 3d, 1879.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock is postponed to the Sixteenth day of February, 1880.

L. L. DENNERY, Secretary.

San Francisco, February 2nd, 1880.

California and Oregon Land Company.—

Principal place of business, San Francisco, California. Location of works, Lake and other counties, Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 5th day of February, 1880, an assessment of Thirty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary.

Any stock upon which this assessment shall remain unpaid on the 15th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 15th day of April, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, 313 Pine street, room 6, San Francisco, California.

Cataract and Wide West Gravel Mining

Company. Principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 2nd day of February, 1880, an assessment (No. 2) of Twenty-five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 26½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 8th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 29th day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. B. LAKE, Secretary.

Office, room 18, 26½ Kearny Street, San Francisco Cal.

Gila Silver Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Reveille Mining District, Nye County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of January, 1880, an assessment (No. 6) of twenty-five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, Safe Deposit building, 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Seventeenth day of February, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the Ninth (9th) day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. W. PARRISH, Secretary.

Office—Room 7, Safe Deposit Building, No. 328 Montgomery street, San Francisco California.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 40) levied on the Twenty-fourth day of December, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Ashby, Mark T	7	5000	$500 00
Ashby, Mark T	16	500	50 00
Ashby, Mark T	10	1200	120 00
Drew, J P	254	500	50 00
Drew, J P	255	300	30 00
Drew, J P	256	200	20 00
Drew, J P	257	500	50 00
Drew, J P	258	250	25 00
Dennis, John C	249	440	44 00
Dennis, Delia H	250	500	50 00
Dennis, Delia H	251	250	25 00
Plaisted, F A	90	300	30 00
Plaisted, F A	91	100	10 00
Plaisted, F A	92	100	10 00
Plaisted, Thankful P	89	500	50 00
Prince, Chas	222	100	10 00
Prince, Chas	223	100	10 00
Prince, Chas	224	50	5 00

Also, 510 shares of the old issue, equal to 2550 shares of the new issue of the capital stock of the said Gover Mining and Milling Company.

Names.	No. of Certificate.	Old No. Shares.	No. New Shares.	Amount
Dennis, E	174	10	50	$5 00
Dennis, Ezekiel	271	10	50	5 00
Foy, J K	300	50	250	25 00
Foy, J K	400	50	250	25 00
Foy, J K	634	10	50	5 00
Foy, J K	035	10	50	5 00
Foy, J K	036	10	50	5 00
Foy, J K	037	10	50	5 00
Foy, J K	050	60	300	30 00
Marr, C H	918	40	200	20 00
Skinner, E C	441	100	500	50 00
Skinner, E C	610	100	500	50 00
Skinner, E C	020	50	250	25 00

And in accordance with law and an order of the Board of Directors, made on the Twenty-fourth day of December, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Monday, the First day of March, 1880, at the hour of one o'clock P. M of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

W. O. WILSON, Secretary.

Office, room 8, No. 402 Front street, San Francisco, Cal.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer County, California

Notice is hereby given that at a meeting of the Board of Directors, held on the Fourteenth day of January, 1880, an assessment (No. 2) of Ten Cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. Gold coin, to the Secretary, at the office of the Company, room 1, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 11th day of March, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors

A. C. TAYLOR, Secretary pro tem.

Office, 314 Bush street, San Francisco, California

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Gold and Silver Mining Company,

Held on the 30th day of January, 1880, at their office, No. 320 Sansome street, San Francisco, California, a

Stock Dividend of 10 Per Cent.

Was declared, payable on and after the 15th day of February, 1880.

R. HEWSON, Secretary.

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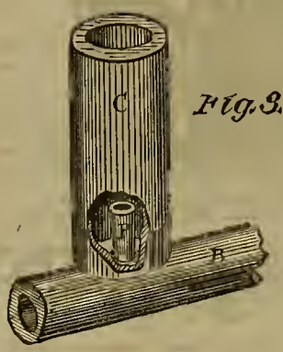

Fig. 3.

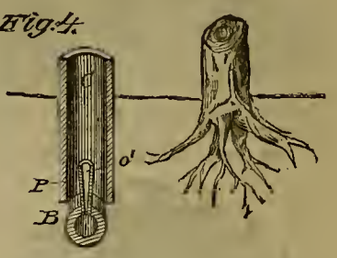

Fig. 4.

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It saves from three-fourths to nine-tenths the water used in surface irrigation.

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The soil is never excessively wet *and cannot bake*, but remains moist, loose and at a nearly uniform temperature, promoting a long-continued Summer's growth.

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No grading is necessary, as the system works perfectly on hillsides and undulating land.

Roots *cannot* get into the pipe, neither can it *suck mud*—difficulties never overcome by any other system of sub-irrigation.

The pipe is made continuously with a recently patented machine which *makes and lays* it in the trench, following all the undulations and curves.

Water is not kept in the pipes; but is applied about twice a month.

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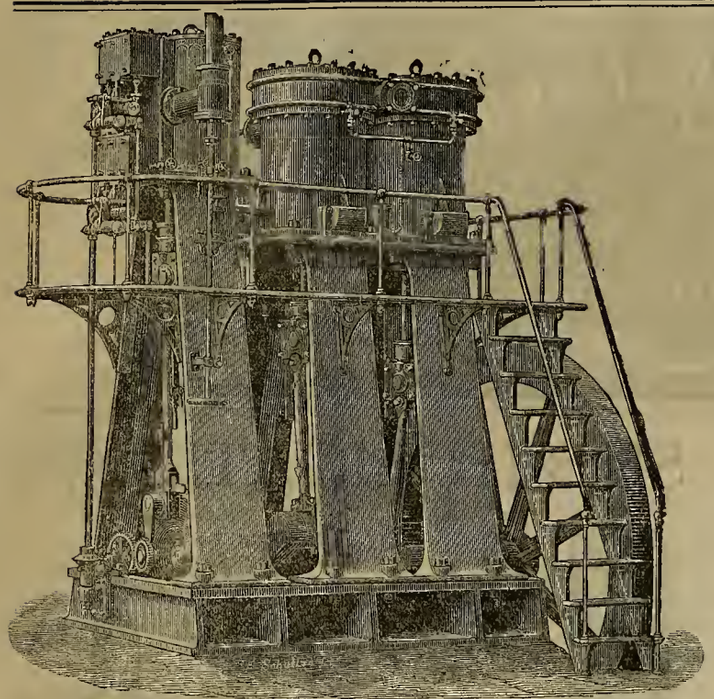

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Power applied to the best advantage. Access ohtainahle to all the valves hy removing air chest covers. Entire ahsence of springs or friction to open or shut the valves. No valve stems to hreak and drop inside of cylinders.

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SAN FRANCISCO, SATURDAY, FEBRUARY 21, 1880.

VOLUME XL Number 8.

Needed Reforms in Mining Matters.

We need a definite legal decision as to the true definition of those mining terms which are now so vague as to admit of various conetructions heing put upon their meaning. We douht if any one can define the legal differcnce hetween "veins," "lodes" or "ledges;" or "dips," "spurs," "variations" or "angles;" or even hetween "locations" and "claims." If a man has located a "lode, vein or ledge," he oertsinly has a "claim" to the "location." True, in the "jnmping" procedure, it very frequently occurs that the jumper "olaims" the property upon which he has never msde a "location." With the vagueness of the ahove terms thero arises a confusion in different mining districts as to their correct application, which not only gives rise to quarrels among the locators, hut frequently forces them into expensive litigation. The courts have from time to time endeavored to eetahlish a fixed meaning to some of these terms, hut as the decisions of different courts have not been uniform, the matter still remains as duhious as ever.

Another needed reform in mining operation is that of a decided reduction in office expensee. The New York mining company have taken the lead in this direction, and have reduced the salaries of all officers one-half. They have also required the President and Secretary to give honds for the faithful performance of their duties. This is in strict accordance with husiness and economical principles, and is a safeguard to the stockholders against loss through the malfeaeance of these officers. Honest men are willing to he watched; dishonest ones need to he so. The more economy is practised in expenditure, the less amonnt the stockholders will have to advance as assessments. Still there is a line heyond which economy merges into parsimony. It is not always the superintendent who is willing to work for the lowest wages that is the cheapest in the end. To he worth anything in the direction of the work in a mine, he should he a man of practical experience hoth in directing the mining and in governing his men. With these reqnisites fully developed, he should he paid fair and liheral wages. Upon him depends, in a great measure, the success of the mine, and if any one of the officers should receive a good salary, he shonld he the one. He has to be on hand day and night. If any nntoward event occnrs in the mine, he is looked npon hy the men as the one who will lead them to overcoming the difficulty. Wherever he will lead, he will always find stout hesrts and sturdy hands to follow and ohey his instructions. As a general rule the President receives the highest recompense. And yet he performs the lightest duties of any of the officers. He goes to the office at his leisure, sits in a comfortahle chair, reads the letters from the mine and the daily papers, goes out for an hour or more to indulge in a lunch, and after that, if the weather is pleasant, spends a portion of his salary in a ride behind a fast team, and closes his arduous duties hy partaking of a luxurious dinner and going afterwards to the opera or theater. He is never called up at midnight to go hundreds of feet nnder ground and work and etruggle to secure a caving level or shaft. If the pumps get out of order he doee not have to etand in the rising water to ohviate the difficulty. The hardships and the responsihilities of the Superintendent are unknown to him. It is in the adjustmeut of wages to the nature of the duties performed that a reform is needed.

An attempt was made on Tuesday last to kill the Imperial family at St. Petersburg, hy exploding a mine in the Winter Palace immediately under the dining hall. Owing to an accidental delay, none of the Royal family were in the hall at the time of the explosion. Five soldiere were killed and 35 wounded.

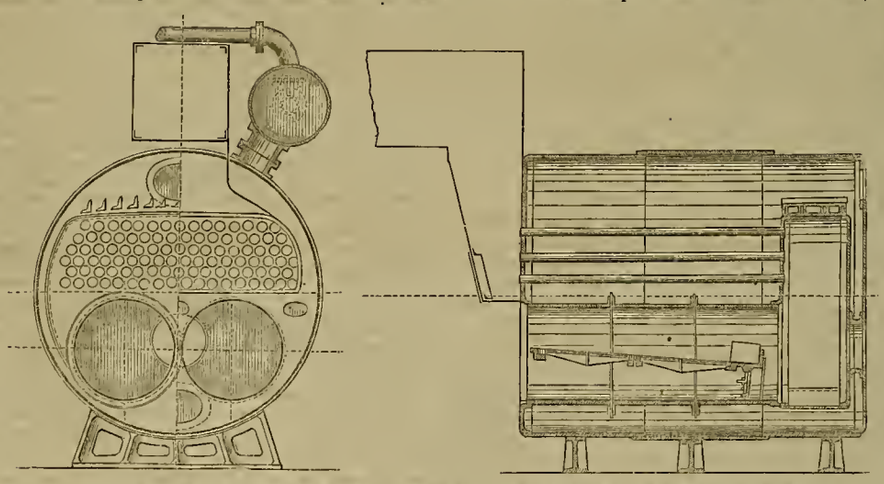
Prescott, Scott & Co.'s Horizontal Boilers.

The accompanying engravings represent a form of horizontal hoiler, with internal furnace and return flues, made hy the Union Iron Works of this city.

The hest American charcoal hammered iron and lap-welded tuhes are worked up in the construction of these boilers; and they are recommended where it is necessary to do away with the ordinary hrick work. They are compact, readily accessihle in all their parts, economical in point of fuel, es, the furnace heing snrrounded hy water, no heat can he lost hy radiation, they will gonerate steam with great rapidity, and can he set np or taken down with little trouhle. Everything is furnished to make these hoilers complete in every particular, such as eafety valves, steam and water gauges, hlow and gauge cocks, etc., etc.

They are made in eight sizes, from 54-inch diameter, 8 feet long, with 230 square feet of heating surface, and weighing 4,915 pounds, up to 90-inch diameter, 10 feet long, with 850 square feet of heating surface, and weighing 15,000 pounds.

Utility of a Babcock Extinguisher. — We have bad a small Bahcock fire extinguisher standing guard on a shelf near the hall hetween our editorial and the press and composing rooms for the past ten years, hut never had occasion for its services during all that time until this week. On Tuesday, a coal-oil stove, which was placed on the floor near the ink fountain of the press, to make the ink dietribute more freely on a cold morning, caught fire and hlazed np to the ceiling. The press room contained several tons of paper in its original packages and a great quantity of other paper stock. The cry of "fire" sounded through the huilding, and the alarmed occupants of the printing office eoon crowded around, looking in a seemingly helpless manner at the increasing flames. A large conflagration was certainly imminent. Suddenly one man thought of the extinguisher and hrought it in. It was no sooner put in use than the burning oil was extinguished in an instant. We have never hefore fully appreciated the advantage of this little appliance, hut in this case it no douht saved several thousand dollars' worth of property. "That press-man of ours" nses coal-oil stoves no more.



HORIZONTAL BOILERS, WITH INTERNAL FURNACE AND RETURN TUBES.

The numher of foreign immigrants who arrived at the port of New York during the year 1879 was 138,945, against 81,505 during 1878, an increaee of 57,440, or 70.5%. The increase during the last quarter was at an evcn greater rate, the numher of arrivals in that portion of last year heing 40,749, against 17,208 in the last three months of 1878, a gain of 23,541, or 73.1%. This shows that the great stream of humanity that pours into this new land is rapidly increasing in volume. There is room yet for millions more.

Placer County Quartz Mines.

In oonversation with a gentleman who has recently visited Placer county for the purpose of examining certain quartz mines, we learn that there is considerahle prospecting going on, and that quartz intereets are looking np. Mining still constitutes one of the leading features of this county, although its foothills oontain many thriving vineyards and gardens, and its fruit trade is very considerahle. It is well furnished with railroads, and has an industrious permanent population.

The Julian mine, one mile from Newcsstle, will have its new 20-stamp mill, with four Frue concentrators ready to run on $14 rock hy the first of March. The Superintendent is Mr. DuBoie, formerly in charge of the Extra mine, Copper City, Shasta county. The Julian was recently purchased hy New York parties for $200,000. The mill will run hy a hurdy-gurdy wheel, with 140 feet fall of water from the Bear River ditch. The shaft is down 700 feet.

The Decker mine, hetween Auhurn and Newcastle, is getting out ore running from $12 to $15 per ton.

The St. Patrick mine is running 15 stamps on what is supposed to he high-grade ore.

Prof. Price and Supt. Roherts of the Rock Creek and Auhurn mine have heen carefully examining the property looking to the adviea-hility of putting up a 20-stamp mill. Water power can be ohtained from the Bear River ditch.

San Francisco Microscopical Society.— The annual meeting of the San Francisco Microscopical Society was held on the 5th inst., when the following officers were elected for the ensuing year: C. Mason Kinne, President; Wm. Morris, Vice-President; Charles H. Dunnison, Recording Secretary (re-elected); Charles W. Banks, Corresponding Secretary (re-elected); G. L. Murdock, Treasurer (re-elected). The report of the retiring President, Henry C. Hyde, was an elahorate review of the work of the society during the year. The Treasurer's report showed the finances to he in fair condition, yet desiring improvement for future operations. The Lihrarian reported that the library consisted of 500 volumes of selected scientific works and was, without dispute, the heet collection of its kind in the State. The cahinet contained ahout 4,500 slides of mounted specimens.

The law prohihiting corporatione from employing Chinamen having taken effect, the East Oakland Jute Factory Company knocked off the seven hundred and ninety Chinamen employed in the factory and shut down for the present.

The German Reichstag have elected Count Von Arnim Baytenzherg President of the Chamher.

California Trade-marks and Labels.

A hill has been introduced in the California Legislature, ohviously to protect lahels and trade-marks, hnt no douht indirectly aiming at Chinese manufactured goods. It provides that it shall he unlawful for any corporation, company or individnal to sell or expose for sale any goods, wares or merchandise of any description whatever, in whole or in part under false signs, lahels, cards or placards. Violation of the provisions of the act is to he considered a misdemeanor and punishahle with fine or imprisonment.

This is the first time, to onr knowledge, that any attempt has heen made in this country to punish hy imprisonment and fine an infringement of patent or trade-mark. In Germany the government guards the rights of inventors in this way hy imprisoning for infringement. Here damages may he ohtained, if the infringer has anything which can he levied on; if not, he goes scot free.

The hill, if it hecomes a law, will he more apt to hring work to the lawyers than to accomplish any great result. In the first place, the question of infringement "in whole or in part" of lahels, cards, etc., is one which will he difficult to decide. In the next place, onr laws on the suhject of trade-marks, lahels, etc., are at such loose ends that the qnestion of ownership of a trade-mark will he difficult to estahlish.

Since the trade-mark law of the United States was declared unconstitutional, we are dependent on State laws for protection. While they are well enough in their way so far as they go, they do not go far enough. The law provides that trade-marks, lahels, etc., may he registered on payment of a certain fee tc the Secretary of State for euch registration. All he has to do is to file them away and pocket the fee. He does not examine the mark, makes no examination of its novelty; hut simply givee a certificate of registration. It is none of his hnsiness whether it infringes some one else's mark or not, the law making no provision in this respect. There is, therefore, no reason why a dozen people should not register the same mark, one after another, and each receive a certificate giving them the exclnsive right to nse it. The Secretary of State has no authority to withhold a certificate, provided the applicant prepares his papers according to rule. With the U. S. government law, examinations as to novelty were made and there was some protection; hut with our State law, as it now stands and ie carried out, great confusion will eventually result.

It seems to us hetter that our present laws should he remodeled, so as to he of practical utility, rather than new ones should he made while the defects of the old still remain. If some of our legislators would examine into the workings of the present law they would see the justice of our remarks.

Discharge of Chinese Miners.—C. Palache, of the firm of H. C. Newhall & Co., local agents of the Great Western Quicksilver Company of Lake county, gives the following particulars of the discharge of Chinamen hy that oorporation and its effects upon the white people there: "The total numher of Chinamen employed was 200, and of white men 21. The Chinese received from 80 cents to $1.25 per day, the minere receiving $1. Following the discharge of the Chinese was that of the whitee, as the price of their lahor was from $2 to $2.50 per day, and the employment of more white lahor at those prices would not permit the company to carry on its husiness with profit. Of the white lahorers, 14 were married and had families, and the 30 children helonging to the little settlement gave employment to a echool teacher and caused the erection of a school house, which will now have to he closed, the worke having been ehut down."

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Manufacture of Copper.

Editors Press:—I have noticed lately several articles in your valuable paper on the subject of copper emelting on the Pacific coast, and coneider the subject worthy of mature and deliberate consideration, as being of great interest and importance to the people of this section.

There is, no doubt, a sufficiency of raw material obtainable from the Pacific States to more than supply our wants in copper in its various manufactured forms. Why then should we send the raw material to England or the Atlantic States, pay high freight on same and on its return in manufactured shape, besidee paying large profits for manipulating the same, while tbie may be done at our doors, thus giving employment to scores of workmen aud retaining within ourselves the money paid on freights and to Eastern manufacturers? It may be said that we cannot compete with the Eastern States in the manufacture of copper. This would be true, provided we had to supply the raw material from distant localities; but fortunately we have the material at home, and I etate positively that the difference in the cost of manufacture on this coast, owing to increased cost of fuel and labor, will be more than counterbalanced hy the freights paid on the manufactured article from the Eastern manufactories to this point. Another objection often made ie that copper smelting has proved a failure hoth in this city and in the State at large. Some years ago, it is true, an attempt was made to reduce copper ores in this city by a *new process*, and proved a failure financially, as any one having the slightest knowledge of the reduction of copper could have predicted. The "new process" was a complete failure, although a small quantity of refined copper wae made by the "old method" fully equal in quality to the hest "Lake Superior Ingot." As the establishment referred to was put up solely to work copper ores hy the "new method," its failure cannot be considered as bearing on the practicability of copper smelting by the old and tried methods.

Another objection offered is that the market for refined copper on the Pacific slope is too limited to justify the erection of reduction works and rolling mills on a large scale. I have no statistics at hand to refer to, hut preeume that there is a considerable consumption of copper annually on this coast, and more or less is exported to China and Japan, which countries could no doubt be snccessfully supplied by the product of a manufactory ovcr the local demand. These countries being much nearer to us than to New York, we could euccessfully compete with Eastern manufacturers, as the difference in freight would be two to three cents per pounde in our favor, besides the eaving of three to four weeks' time in shipments. The writer well remembere the time when all the copper ores mined in the United States and South America were ehipped to Swansea for reduction, and the refined and manufactured copper bought in that market for consumption in this country.

Some 40 years ago eome capitalists in Baltimore ventured the reduction of copper ores at that point, and the enterprise proved a decided euccess, returning to the promoters a rich return on their investment. This establishment has continued in successful operation to this day, and is a large purchassr of copper ore hoth in the United States and South America.

The time is not far distant when the capitalists of this coast will make a similar investment, with like results. It is unnecessary at the start to employ a very large amount of capital in this enterprise, but as ore in sufficient quantity could not he procured near the city, more capital would be required than otherwise would he the case, as low-grade ores would have to be beneficiated hy smelting at the mines to admit of shipment for final treatment in this city, and hence a considerable sum would he invested in preliminary emelting plant. Most of the ores sent to this city for re-shipment to England or Baltimore coutain 25%, or more, of copper, and is sold here at $2.50 for each unit of percentage, or, say, for 25% ore, $62.50 per ton of 2,000 pounds, a deduction being made from the humid assay of the ore of 1 3-10%, which deduction amply covers loss of metal hy the manipulatiou of the ore. The price paid for ore, of course, varies, fluctuating with the price of refined copper; the ahove figures are hased on refined copper at 25½ cents per pound, the present price. At the above rate, the smelter pays for the copper in the ore at the rate of 12½ cents per pound; the cost of reducing ores of 25% to fine copper will not he over 4½ cents per pound, all told, making the cost of the refined copper produced from the ore 17 cents, leaving a margin of 8½ cents per pound, at present price of the metal. Ae hut a emall quantity of 25% ores can he had in the city, it would be necessary, in order to insure an ample supply of material, to have in favorahle localities one or more furnaces to beneficiate, by emelting, ores of a lower grade than could be profitably ehipped to the city in its raw state, the product of such beneficiation being either crude or "black copper" of 80% purity, or regulus, or "matte," of, say, 50%. There are many mines in this and the adjoining States, which can produce a coneiderahle quantity of 10% to 15% ore, hut which yield little or no ore of sufficient grade to pay for shipment. These low-grade ores could no douht he hought at the mines for $1 per unit of copper, or $10 to $15 per ton. The copper in the ore, at the ahove rate, would cost the smelter 5 cents per pound; $10 per ton, or 5 cents per pound of copper, will reduce the ahove to either "hlack copper," or "regulus," as previously mentioned. The cost of the copper in this product will be 10 cente per pound; an additional 5 cents per pound is ample to cover freight and the cost of refining the "black copper," or "regulus," makiug the cost of refined copper 15 cents per pound, leaving a margin, with copper at 25½ cents, of 10½ cents per pound.

An outfit for the smelting of low-grade ores, as above specified, would consist of a 25-horse power eugine with boiler; a No. 5 "Baker blower," a Blake crusher and a water-jacket hlast furnace, together with a few rough huildings; a complete outfit for the reduction of 50 tons of ore per day to "regulus" or "black copper" would cost not to exceed $10,000.

The refining worke, located at or near the city, of a capacity of five to eight tons of refined copper per day, would consist of a 30-horse power engine and boiler, a Blake crusher, one large reverberatory calcining furnace, two roasting furnacee for making "blister" or "pimple" copper, one refining furnace, one water-jacket blast furnace, one blower with a substantial building 200x50 feet in dimensions. Such a plant would cost from $40,000 to $45,000.

A copper rolling mill is very costly—an immense amount of machinery is under ground and out of sight, the foundation for and part of the working gear of the immense rolls used.

An establishment for rolling four tons of copper per day, into sheets or bars, would consist of an engine and boiler of 250-horse power; two pairs of "hreak-dowu rolls;" two pairs "finishing rolls;" two pairs "bolt rolls;" one pair large rolls; two pairs yellow metal rolls; eight anpealing and heating furnaces; five pairs shears; one furnace for making "yellow metal" (hrass); one set of stamps for stamping kettle bottoms, and one "tinning department"—the whole outfit complete costing from $13,000 to $14,000 for each pair of rolls, or, in all, from $120,000 to $130,000.

Tbe cost of rolling in the East for all kinds of orders averages about three cents per pound; the same work may cost on this coast three and a half to four cents per pound; the differcnce in the price of manufactured copper is often ten to fifteen cents per pound. The loss of copper by wastage in mauufacturing does not exceed eight pounds to the ton, or four-tenths of one per cent.

Franklin Farrell, of the Farrell Foundry and Machine Works, Ansonia, Conn., is the hest copper mill builder in the United States, the company of which he is the head making a specialty of the manufacture of copper rolling machinery.

I trust this article may be of some interest to your readers, and hope that this suhject may receive the attention it merits.

John Williams.

San Francisco, February 10, 1880.

Mineral Ranges of Beaver County, Utah.—There are four distinct mineral-bearing ranges in Beaver county. The Granite range heing on the east side of Beaver valley, up which the Utah Southern is being built, in which is situated the Cave mine, Coral Reef, Richmond, Old Lead mine, Jolly-Boy and many othere. Then comes the Star range, easy of access, lying on the west side of the valley, with Rocky and Beaver Lake districts lying on a line aud only broken by two washes or natural passes for railroad or wagon roads to Frisco, the headquarters of the Horn Silver mine. Then comes the San Francisco range, ahout 10 miles long, 12 miles from Star district west and 16 miles from Milford, in Beaver valley, the proposed junction of the Frisco branch of the Uuah Southern, from which the locomotive to Frisco will have to climb 1,600 feet, that being the altitnde ahove Milford, but on an easy and gradual grade up the grand wash to said burg. The Wah Wah range, 12 miles west of the San Francisco range, is about thirty miles long and forms the boundary of Utah and Nevada. In this range is situated Pine Grove district. It is also the home for saw mills and charcoal camps, for it is in this range that Lamersdoffville is sitnated, with Charles Lamersdoff as the hishop of the stake. All these ranges show, today, numerous outcroppings of valuable metals, upon which comparatively little work or prospecting has been done. The discovery of the Horn Silver mine did considerahle to encourage prospecting and further developments, hut the past low price of lead and long and slow transportation which we have had to endure have seriously retarded the development of good mining claims in thie county and all through southern Utah.—*Salt Lake Tribune.*

A Curious Find.—While a miner was at work on the 385-foot level of the Standard mine, pickiug in some rather hard ground, there rolled out and fell at his feet a fossiliferous rock, which is quite curious. One side is perfectly smooth and leaves the impression of a broad-leafed fern. The formation is perfect and slightly raised out of the smooth surface, which has a rather bluish color. Here is something for the scientific man to explain. To find a vegetable fossil in ground of euch a character is something unusual.—*Bodie Free Press.*

Changes in Plant Life on the San Francisco Peninsula.

The following essay, which will he of interest to all botanists and observers of plant growth generally, was read at tbe meeting of the Academy of Sciences, February 2d, by Dr. Herman Behr of thie city:

We are not very apt to notice changes that gradually and progressively prepare themselves in our surroundings. We have no room in our journals for facts of every-day occurrence, and at the same time these gradual changes offer more analogiee to the great secular changes that have preceded the present state of our glohe, and give more material for the study of evolutions than all floods, earthquakes and other cataclysms.

All vegetation of our earth is suhject to secular changes, and it is not necessary to go to the fossil plants, imbedded in coal, to find ample proofe for this axiom. The bogs of northern Europe, the lacustrine dwellings of tbe alpine regions, show in different strata the remainders of different forest trees; and in the Atlantic States many acute observers have noticed that the birch gradually supersedes the conifers.

Such a process of change of course is accelerated, if to the secular procese of change is added the powerful agent of human activity. I have had the good fortune to witness this process in two different quarters of the globe; in Australia and in Californuia.

The neighhorhood of San Francisco and its flora in the year 1850 was not entirely iu its natural state, but still the three original types of landscape that constituted the regiou could well be distinguished. The sand-dunee and hills were covered hy a dense chapparal of live-oak (*Quercus agrifolia*), *Ceanothus thyrsiflora*, and on northern well-moistened declivities hy buckeye trees (*Æsculus Californica*). In some localities a wild cherry (*Prunus ilicifolia*) entered this combination, but was in growth and foliage eo little different from the other components that it easily escaped notice.

This whole region grew very little grass, a fern (*Pteris aquilina*) forming a kind of a rough and rathor transparent turf. With tbe exception of a *Scirpus*, even on marshy places no Cyperaceous plaut was growing. *Achillea*, *Millefolium*, *Baicharis*, *Solidago*, *Scrophularia* and *Mimulus*, distrihuted in tufts, varied the otherwise naked ground. The depressions of this formation frequently contained marshes with a shruhhy vegetation of currant bushes (*Ribes malvaceum*), and gooseherries (*Ribes Californicum*) and a herbaceous vegetation of *Helenium*, *Baicharis* and *Mimulus*.

This character of vegetation reached almost without any modification up to the Mission Dolores, where grassy plains and hills, containing arborescent growths only in their ravines, took its place. A belt of the same formation extended from North Beach to the Presidio, interrupted here aud there by the *Artemisia* and *Franseria*, vegetation of the moving dunes and the seashore.

The character of this open tract was in no way different from that of the common California pasturage ground when its vegetation is not yet too much interfered with. A turf, mostly of annual grasses, whose monotony relieved by frequent patchee of *Nemophila* and *Eschscholtzia*, is interwoven with different species of *Sanicula*, *Orthocarpus*, *Castillega* and *Lupinus*, the latter in their arhorescent species frequently forming miniature forests.

The third formation of landscape was the most characteristic, and many of the component parte of its flora have entirely disappeared from our neighhorhoods; one of them, an *Arenaria* of eingular beauty, probably is extinct; at least has not yet been found again in any other locality.

This formation occnpied the southern part of the peninsula, and consisted of a large marshy plain, merging towards the sea into the common California marsh full of meandering, brackish creeks and separated on the other side from the ceanothus and live oak, and chapparal by a densely interwoven and much varied arhorescent vegetation, where the trees of the chapparal mingled with *Myrica*, dogwood (*Cornus*), honeysuckle (*Lonicera*), *Garrya*, hay tree (*Oreodaphne*), *Photinia*, etc. A corresponding herbaceous vegetation of luxuriant *Megarrhiza*, hemlock, *Heracleum*, different species of *Rumex*, *Polygonum*, and three gigantic species of *Aspidium* covered the hlack and yielding ground.

After having penetrated this helt, you wonld euter a boggy prairie, in which stripes of the above-mentioned arhorescent vegetation indicated the more elevated points and ridges.

The vegetation of the prairie itself was a most anomaloue one, considering the latitude and the merely nominal elevation above the level of the sea. It was a spec of the Arctic flora. Out of a mossy surface rose the slender culmi of a *Festuca*, mixed with *Carex* and *Eriophorum*. The characteristic *Menyanthes trifoliata* showed everywhere its feathery racemus; at present, when you wish to see them, you have to go to Alaska or to very considerable mountain elevatious.

Besides these was growing a *Habenaria*, and the *Epipactis gigantea*, two Orchideous plants.

Angelica, *Heracleum*, *Oenanthe*, *Hydrocotyle* and *Nuphar* represented a vegetation which can he studied etill in some localitiee of this peninsula, hut not in such vicinity of the city.

Wherever the moisture formed a surface it was immediately covered by tbe graceful *Azolla Caroliniana*, a *Bidens* and the *Arenaria* ahove mentioned that has not yet heen found again.

Now the first-mentioned type of vegetation, the chapparal, exists still in some fragments in the Presidio reservation; the second, that of the pasture land, is to he met with still, wherever the distance from the city is considerable enough to protect native vegetation; hut the third type has entirely disappeared.

We now come to the causes. It is not only the quick growth of the city, the sudden change of grade, etc., that have disturhed the original equilibrium in nature; for there still exist lonely, neglected places enough in the immense circumference of the city, where an original vegetation could have remained undisturhed and where it was protected even against the attacks of domestic animals.

By comparing the present flora of the surroundings, we shall easily recognize one of the most powerful agents in the destrnction of original vegetation. At present tbe three original types of landscape are no more distinguishable. The improvements of a growing city have brought all to the same level. The original arborescents have been cut down partly for fuel, partly to make room for houses. Horticulture has replaced them hy the conifers of our Sierra and the evergreene of Australia.

The vegetation of the peuinsula ie at present more Australian than Californian, and if it was not for the heauty of our sequoias, pines and firs of our mountains, scarcely any California tree would have found admission.

Parallel with this artificial immigration of Australian arhorescents, goes an herbaceous immigration from Europe and Africa.

Our original vegetation has very little power of resistance. Its very variation is a proof of a certain want of vitality, for any more vigorous organization, by superseding the weaker ones, would have produced originally the monotony developed at present by the immigration of foreign plants.

First of all I mention *Silybum Marianum*, a native of the Mediterranean region, observed hy me the first time in 1854 in California, in 1848 in South Australia. Wherever it gets a hold of the soil all native vegetation disappears. California is not the only land invested by tbis thistle. I have witnessed the same invasion in South Australia, and have read the statement of my former teacher, Prof. Burmeister, at present in Buenoe Ayres, that the same thistle protects, through the time of its vegetation, the settlers against inroads of the Pampas Indians, as eveu there wild horsemen cannot cross the immense thickets formed hy the same species of thistle.

The influence of this weed ie not confined to the neighhorhood of San Francisco, and it is chiefly the miniature forests of Lupinee that suffer from its invasion.

Another weed, *Cotula coronopifolia*, does the same work in moiet ground that ie hegun by Silybum in the more arid tracts of soil. The plant, a native of Southern Africa, was observed for the first time by me in 1854. I also have witnessed its invasion of South Australia, and I recollect very well the single specimen I found near Adelaide in 1845. It is well known in Mediterranoan Europe, but as to the date of ite invasion, I only know that it was common there at the same time when I found the first specimen in Australia. This weed has transformed the varied aquatio vegetation of the different places invested by itself into one monotonoue green mass with yellow buttons. Our gracefnl water fern, *Azolla*, that formerly ornamented abundantly our creeks hy its floating turf, is scarcely to be found any more.

Now, hoth of these plants which could he called "the coming plants," are Syngenesists or Compositæ. The Compositæ themselves are characteristic of the most modern flora, for in a fossilized state they are only found in the moet modern formations; in fact, the only fossilized Compositæ of which I know, were products of a river that fossilized everything thrown into it. Now it appeare that in the fight for existence the junior sons of creation have a decided advantage, and this accounts for the otherwise inexplicahle circumstance that the variety of organisms decreases so perceptibly when we enter the realms of *Gymnosperms*, vascular *Cryptogams* and all those forms of organic life that exieted already in the early periods of the earth.

Copper Mines of Winnemucca District, Nevada.—The price of copper has materially advanced in the past month or two, and copper mines are again heing sought for hy capitalists. This circumstance reminds ns of the fact that there are extensive copper-hearing leads in the Harmony range of mountains, within five miles of this town. One of these ledges crops out at intervals for a distance of half a mile, and specimens of the ore taken from the croppinge three feet ahove the surface of the ground carry 30% of metal. Numerous copper veins are known to exist in the range, only a few of which have been located, and all of which can he had at a trifling cost. Now that copper is going up, and is in demand, these minee ought to be developed. They are situated not more than five miles from the depot, and are easy of access at all seasons of the year. How permanent or valuahle they may he has to he determined, as none of them have been prospected to any extent, hut that the ledges crop out boldly and contain rich ores at the surface are indisputahle facts.—*Silver State.*

MECHANICAL PROGRESS.

Putting up Shafting.

The writer once had the putting up of considerable shafting, and following are some of the data respecting the same, the rules and formulas found in text-books being insufficient to form a correct opinion by. The writer found that 800 pounds, acting on the end of a 12-inch lever, would twist off a wrought-iron shaft one inch in diameter. The *length* of the shaft had no influence on the breaking or twisting-off force, or torsional strength of the shaft, though on the length depended the torsional elasticity. The speed of a shaft controls its size, that is, if a one-inch shaft is large enough to transmit a given force at 50 revolutions per minute, a shaft running at 100 revolutions per minute will transmit the same force, its *area* being one-half of the one-inch shaft. This is plain enough when one remembers that the surface of a pulley on the smaller shaft travels *twice* as far in the same time that a similar surface on a similar pulley on the slower shaft travels, and hence needs transmit but half the force, to equal the force through half the distance.

Suppose we have a factor of safety of 4, this will allow of our continuing a force of 200 lbs. (800 ÷ 4 = 200) on the end of our 12-inch lever. That is, 200 will be a safe load. Now, if we wish to find the *area* of a shaft, to transmit 10 H. P. at a speed of 300 revolutions per minute, over a 24-inch pulley, we multiply 33,000 feet (one H. P.) by 10 H. P., obtaining 330,000, which, divided by the number of feet the run of the pulley passes through per minute (6.28 ft. + 300 revolutions), will equal the strain on the end of a lever equal to the radius of the pulley. In this case supposed, the radius of the pulley equals 12 inches, the size of the one for comparison. If it had not it would have been necessary to reduce it to 12 inches, that is, the effect the force would have at 12 inches. This force, whatever it may be, then being divided by 200 (the safe load on a one-inch shaft) will equal the area of the needed shaft, that is, it will equal the area in units of the area of a round shaft one inch in diameter—7,854-10,000ths of a square inch.

To reduce the radius of the pulley, whatever it may be, to the standard of the unit of comparison—12 inches—suppose the pulley was 40 inches in diameter, the radius is 20 inches. If the force as found were 50 lbs., we would multiply the 20 inches by 50, and divide the product by the length of our standard lever, 12 inches. The result being the weight necessary at the end of a 12-inch lever that would be equal to the force or strain on the belt over the pulley. For instance, let us take the conditions of the case given: Number of feet raised one foot high in *one* H. P. × 10 = 330,000. Circumference of pulley = 6.28 feet, which multiplied by 300 = 1,884 feet per minute, that the rim of the pulley moves through; 330,000 ÷ 1,884 = 175.15, that is 175.15 lbs. is the constant strain on the belt, because 175.15 lbs. through 1,884 feet = 10 H. P. = 330,000.

This steam is transmitted to the pulley which acts as a lever, equal to the radius of the pulley, tending to twist off the shaft. The radius of the lever in this case is 12 inches, which happens to be the same as our lever of comparison.

Thus we have a force of 175.15 lbs. acting on the end of a 12-inch lever; 200 lbs. on the end of a 12-inch lever was, as previously stated, a safe load for a one-inch round shaft; 175.15 ÷ 200 = .875 = ⅞ of the area of a shaft one inch in diameter = .6872 of a square inch, and would be a trifle over nine-tenths of an inch in diameter.

Thus, so far as torsional strength is concerned, a one-inch round iron shaft will transmit with safety 10 H. P.; but there is another feature of the question to be looked after, and that is the lateral stiffness of the shaft.

A one-inch shaft, five feet between hangers, will be deflected from a straight line 9-64ths of an inch by a pull of 28 pounds midway between hangers, while a pull of 56 pounds will cause a deflection of ¼ of an inch. However, there are few shafts of two inches and under that are not constantly deflected ¼ when transmitting power, especially if the pulley is midway between the hangers. The deflection of shafting is approximately represented by the general law that deflection increases as the cube of the length, and inversely as the cube of the diameter. Thus, if we should leave but 2½ feet between hangers, the deflection would be $(2\frac{1}{2})^3 = 15.6$ and $5_3 = 125$, and $125 \div 15.6 = 8$, therefore the deflection at 2½ feet between hangers would be 8 times less than it would be 5 feet between hangers. A 1½-inch round shaft, 10 feet between hangers, will be deflected 9-16ths at the center by 56 pounds.

A three-inch shaft, 10 feet between centers, would be deflected a trifle more than 1-16th at the center by a pull of 56 pounds. The remedy for deflection is more bearings, getting the pulleys as close as possible to bearings, and speeding the shaft up. Small shafting will not break, nor twist off when put up in accordance with the above data.

Many dollars have been thrown away in putting up large and slow-running shafting, which is so expensive at first cost, liable to break for want of alignment and excessive weight. The lighter shafting is by far the most economical in every respect—first cost is less, expense of putting up and keeping up is less, and has a longer life, and runs with less friction.

How many of your readers would be surprised to see a two-inch shaft taking off 100 indicated H. P.? A great many, I think. Still, I have in mine just such a shaft, which has been doing the above amount of work for 11 years, and which was put in to take the place of a four-inch shaft, which had broken repeatedly. I believe I am correct in saying that there is no necessity for a line shaft larger than two or two and one-half inches in any shop or manufactory in the United States. The shaft mentioned above as taking off 100 H. P. made less, I think, than 200 revolutions per minute. The shaft might easily be reduced in area one-half and more by doubling the speed. There are a great many shops, now running with three and four-inch shafting, that might make a few dollars by selling the same and replacing it with one and three-fourth and two-inch shafting. It will be well to remember the following: Never put up a slow-revolving shaft when a fast one will do as well (and that is nine cases out of ten). Increase the bearings, as such increase does not affect the friction, and increases the life of the shafting.—*V. Hook, in American Machinist.*

Hardening and Tempering at One Operation.

Steel hardens when suddenly cooled from a red heat, and whether the heat be extracted by immersion in water or other matter, is of no consequence, so long as it is extracted with sufficient rapidity to effect the hardness. The degree of hardness depends first upon the temperature to which the heated steel is raised; and, secondly, upon the rapidity with which the heat is extracted. Water is the medium mostly used for this purpose, but it is a well-known fact that if water of a sufficient degree of soapiness be employed, the steel will not harden.

It is obvious, however, that the degree of soapiness may be so varied as to either prevent the steel from hardening or to have no practical effect upon the hardening. It is also obvious that it is possible to obtain a degree of soapiness that shall give to the steel any required degree of temper, and thus temper the tool without having to harden it at one operation and temper it at another, which would dispense with the hardening process and thus save both time and fuel, as well as oil or other material ordinarily used for the tempering. That tempering processes will ultimately be based upon this principle there can be no doubt, the difficulties (which will be explained presently) being so slight as to be easily overcome.

In my last communication I described one method of tempering at one operation, and I have now to describe another method which has been employed by the Monitor Sewing Machine Company to temper their small spiral springs.

In this process the steel is heated to the usual degree and cooled in a mixture of milk and water. The proper proportions of milk to water would undoubtedly vary with the quality of the milk, hence it must be arrived at by trial. The more milk the lower the temper, all other things being equal, and conversely the less milk (in a given quantity of water) the higher the temper. The proper mixture once attained, the tempering can be carried on very expeditiously, but it is apparent that such a process is more suitable for tempering in quantities than for single pieces, especially when the grades of steel may be variable.

The difficulty in obtaining uniform results lies in the difficulty of heating the pieces to an exactly equal temperature before dipping them, for it is found that a very small difference in the heat of the steel makes a wide difference in the degree of temper obtained, but it may be stated positively that with a uniformity of heat the best of spring tempering may be obtained.

In this connection, there arises the question whether a good spring temper may not be obtained by heating the steel to a low red heat and mixing a lesser quantity of milk therein (the requisite quantity to be determined by experiment). If such is the case, as seems highly probable, the process is expedited in the heating part of it. This would leave the steel tougher, while, at the same time, it would obviate the liability of burning the steel.

The easiest method of heating would, in this case, be to employ a flux heated to the required temperature.

For a higher grade of temper, such as is represented in color tempering by the shades of yellow and light brown, it is probable that it would be necessary to heat the steel to the usual degree for the hardening process, but even then it would require experiment to determine the proper temperature.—*Joshua Rose, in Blacksmith and Wheelwright.*

THE TRANSMISSION OF MOTIVE POWER BY ELECTRICITY.—At the Shaw's Water Chemical Works, Greenock, a practical experiment of this kind is now in progress, which is of special interest. Two of Siemens' dynamo-electric machines are used for the purpose, a waterfall behind the works furnishing the power. The waterfall drives the turbine, this in turn drives the first electric engine from a shaft and belting, and the electricity generated is conveyed by the metallic conductors to a second engine in the shop, 150 yards off, where it is converted into mechanical energy, which is distributed by the usual mechanical devices, to the places where it is required. In this case the machine drives a circular saw, a turning lathe and a vertical boring machine. The trials above named are said to be, for the present, purely experimental. They have a special interest, however, as being among the first, if not the first attempts to actually test the practicability of transmitting motive power by electricity.—*American Manufacturer.*

SCIENTIFIC PROGRESS.

Why the Sky Appears Blue.

"Why is the sky blue?" is a question, says a recent number of the *Academy*, which has often been asked, but never satisfactorily answered. Helmholtz offered an explanation which depended on the reflection of solar light by the air particles in the atmosphere. These particles being very minute would reflect preferably the shortest waves of light, namely, blue waves, while they would allow the longer waves, corresponding to green and red light, to pass through them; just as a log of wood floating on the surface of still water would throw off the tiny wavelets caused by a falling drop in its neighborhood, while the same log in long ocean swells would be tossed to and fro without noticeably impeding the progress of the wave.

Dr. E. L. Nichols (in the *Philosophical Magazine* for December) has propounded another view, which has much to recommend it. According to Young and Helmholtz's theory of color-impression there are in the eye three sets of nerve-termini, one set chiefly influenced by the red, another by the green, the third by the violet rays. The impression of color is the resultant of the intensities of these three effects. The impression upon these nerves is not directly proportional to the intensity of the ray, the different nerve-termini being subject to different laws. For very feeble rays the "violet" nerves are very sensitive, while the "green" and "red" nerves scarcely act at all. As the light increases in intensity the "red" and "green" nerves increase in activity, while the "violet" nerves become tired and dazzled. For rays of dazzling brilliancy the "red" nerves are in their most sensitive condition. Thus, of the simple colors, as the brightness increases, red and green change to yellow, blue becomes white. Daylight at ordinary intensities affects the three sets of nerve-termini equally; the resultant impression is whiteness. Now daylight is simply the light of the sun weakened by manifold diffuse reflections. The direct rays of the sun, as we let them fall upon any colorless object, appear also a white light; but on attempting at noon on a clear day to gaze into the sun's face the impression is of blinding yellow. It is not that the direct rays differ in composition from diffuse daylight, but that the "violet" nerves cannot transmit the action of such strong light. The moon, with enormously less illuminating power than the sun, seems bright, and is far brighter than the open sky. In passing from the intensity of the moon's rays to those reaching us from a corresponding bit of the open sky, we may, perhaps, take a step as great as that between the brightness of the sun and moon. In general, white light will appear bluer and bluer as its intensity diminishes, and this law will apply to the skies; as the light they reflect becomes fainter and fainter they will increase in blueness, even though the light by the process of reflection suffer no change in composition.

ON THE PROBABLE TEMPERATURE OF THE PRIMORDIAL OCEAN OF OUR GLOBE.—According to the latest hypotheses as to the quantity of water on the globe, its pressure, if evenly distributed, would be equal to a barometric pressure of 204.74 atmospheres. Accordingly water, when first it began to condense on the surface of the globe, would condense at a much higher temperature than the present boiling-point under ordinary circumstances. The first drops of water formed on the cooling surface of the globe may not impossibly have been at the temperature of molten iron. As the water was precipitated, condensation of the remaining vapor took place at a lower temperature. The primordial atmosphere would be more oblate and less penetrable by solar heat than the present, and the difference of temperature between polar and equatorial regions would be greater; so that, in the later geological times, ice may have formed in the one, while the other was too hot for animal or vegetable life.—*Phil. Mag., Jan., 1880.*

A MINERALIZED FOSSIL.—Some specimens collected in South America by M. Fremier, who was for some time director of the silver mines at Caracoles, have been examined in Paris by M. Jannettaz, who has discovered among them an extraordinary example of an ammonite transformed into native silver. It was found with a number of other ammonites belonging to the two species *A. peramatus* and *A. plicatilis*, but these had not been mineralized with silver-salts. The ammonite in question has, on the other hand, been entirely replaced by chloride of silver, which has been partially reduced to the metallic condition. Light is thrown by this specimen upon the origin of the native silver which occurs in the Caracoles mines; for it is only fair to infer that this metal has, in like manner, been reduced from the state of chloride at a period not earlier than the deposition of Oxford clay. The description of this ammonite in silver will be found in the current number of the *Bulletin* of the Geological Society of France.

Difficulties in Surveying.

During the last few weeks, the magnetic needles of our galvanometers have shown their sensitiveness to the electrical changes in our atmosphere. About a fortnight ago, I was rather struck on observing the leaves of a gold-leaf electroscope promptly diverge and suddenly collapse, owing to the discharge of atmospheric electricity in our latitude.

Several times in succession the behavior of the electroscope was magnificent, inasmuch as I sat up late at night recording no less than 27 charges and discharges of the leaves. This prompted me to attach by a wire one binding screw of a galvanometer to the rails of a wagon-way which has a length of about 10 miles. The other binding screw of the galvanometer I connected to the gas pipes which pass through our villages. By this means I had an earth connection of about 100 square miles. The circuit completed I anxiously awaited results. Scarcely had I made the connection than the needle of the galvanometer quivered to the right and left of the zero point. Sometimes a deflection was caused having an angle of three degrees; but the majority of deflections were upwards of seven degrees. Afterwards I tried a shunt, but utterly failed to register accurately the amount of deflection. At every deflection of the galvanometer the surface of the earth had its electrical condition changed. The storms were, in the majority of cases, unheard, and seldom a flash of light was seen.

Having the opportunity the other day to be standing beside a mining dial in a mine having a depth of about 170 fathoms, I stood in amazement at seeing the *north end* of the needle *repelled* by a brass Clanny lamp, having a copper gauze. Certainly we know that carbonic acid, hydrogen, oxygen and nitrogen repel the magnetic needles of our surveying instruments, but not such an amount of dia-magnetism is found in the above-named gases as to be taken into consideration. Copper showing the greater dia-magnetic properties over the gases no doubt accounts fully for the behavior of the needle, as the latter must have been particularly sensitive to the electric state of the moving current. Such phenomena, though occurring at rare intervals, give rise to a series of questions, on which the best authorities seem not at all agreed. It would appear from the action of the various magnetic needles under these most strange circumstances that they are ever in search of a position of rest.

Should the magnetic curve be traveling westward in any locality, and awaiting the earth's electrical equilibrium to be restored, no doubt at these precise moments a bundle of errors can be committed even by the most skillful and practised surveyor. Or, suppose the magnetic curve be traveling eastward, the more glaring will be the error in long and delicate surveys. The direction of the earth's magnetism has a close relation to the earth's shape, but as we know it is not in any way the cause of this shape, we may suppose that the figure of the earth and the rotation, which causes the earth to keep this figure, have something to do with the production of magnetism.

At present there must be some influence at work which, along with the earth's rotation, results in magnetism. What is this influence? I venture to say the sun. The most distinguishing features of it are chiefly these four:—(1.) Its rifts and general radiating appearance. (2.) The crossing and bending of rays. (3.) Its self-luminosity, as spectroscopic observations have shown. (4.) Its changing and flickering character. After a prolonged period of solar quiescence, the disc of the sun is beginning to assume new features, and will most assuredly cause magnetic storms.

The late French mathematician (Leverrier) long since pointed out the absolute necessity of care, and warned surveyors against the hasty conclusions arrived at of their surveys.

Under the present circumstances long and delicate surveys ought to be deferred, if possible. Time forbids me saying more.—*Ralph Loudon, in Colliery Guardian.*

EARTHQUAKES AND THE PLANETS.—Mr. J. Delauney has presented to the Paris Academy of Sciences some new results obtained from a study of Perrey's tables of earthquakes from 1750 to 1842. He finds two groups of maxima, commencing in 1759 and 1756 respectively, each with a period of about 12 years; and two other groups, commencing in 1756 and 1773 respectively, with a period of about 28 years. He remarks that those of the first two groups coincide with the times when Jupiter reaches the mean longitude of 265° and 135°; while those of the last two coincide with the times when Saturn reaches the same longitudes; whence he infers that terrestrial earthquakes have a maximum when these planets are in the mean longitudes mentioned. Delauney attributes the increased number of earthquakes in winter, which Perrey has found to reach a maximum in November, to the passage of the earth at that time through swarms of meteors; and in like manner supposes the influence of Jupiter and Saturn to be due to their passing through meteor streams situated in mean longitudes 135° and 265°. As a consequence of this he ventures to predict an increased number of earthquakes in the years 1886, 1891, 1898, 1900, etc.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 29.		Week Ending Feb. 5.		Week Ending Feb. 12.		Week Ending Feb. 19.	
Alpha	10¾	10¼	10	9	9½	9	9	7¾
Alta	4.85	4	4.60	3.90	5½	4¼	4.30	3.70
Andes	1.20	90c	1	85c	95c	85c	90c	75c
Alps	....	....	....	....	....	....	....	....
Argenta	1¼	1.10	1.20	90c	1.30	1	1.30	1
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	12¾	10¾	11¼	8¾	11¾	10¼	11¾	10¾
Belmont	60c	40c	50c	....	50c	40c	40c	35c
Best & Belcher	13¾	11¼	12¼	9¾	10¾	9¼	9¾	8¾
Bullion	5¾	4.80	5¾	4.40	4.55	4.20	4.55	3.55
Beehtel	2	1¾	2½	2	2.15	2	2.20	2.05
Bolle Isle	1.70	1.20	1.10	75c	1.20	75c	1¼	90c
Bodie	9	8	12	8¼	10¼	9¼	8¾	8¼
Benton	2.80	2.10	2¾	1.35	2.90	2	2.80	2.40
Bulwer	11	10¾	11	10¼	10¾	9¾	9	8¾
Boyle	....	....	....	....	....	....	....	....
Black Hawk	80c	70c	1	75c	90c	70c	80c	70c
Belvidere	1.10	95c	1¼	1.10	1¼	1	2	1.30
Booker	50c	40c	90c	60c	30c	65c	70c	55c
Caledonia	2	1.35	1.60	1.15	1.20	1	1.05	75c
California	4	3.70	4	3¼	4	3.45	3.90	3.45
Challenge	2.30	1.90	1.95	1.60	1.70	1.60	1¾	1.60
Chollar	9	8¾	8¾	6¾	8	6¼	6¼	6
Confidence	9	8¾	8¾	7	7	7	7	....
Con Imperial	85c	75c	75c	60c	65c	60c	65c	60c
Con Virginia	4¼	3.90	4¼	3.35	3.45	3.35	3.85	3¼
Crown Point	5¼	5	5¾	3.40	5¼	4.40	4.85	4.40
Cash Washoe	25c	....	....	....	25c	....	....	....
Champion	60c	25c	75c	35c	75c	50c	55c	50c
Concordia	....	....	....	....	50c	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Dancy	....	....	....	....	40c	35c	35c	....
Day	70c	30c	70c	50c	60c	55c	60c	40c
Eureka Con	17	16	16¼	16	16½	....	16¼	15
Exchequer	3.70	3	3.15	2.65	3.65	2.60	3.40	2.90
Endowment	40c	30c	40c	....	40c	....	35c	30c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1.70	1.55	1¼	1.30	1.35	1.30	1.30	1¼
Gila	10c	5c	10c	5c	5c	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	10¾	10	10¼	....	15	14	....	....
Goodshaw	40c	35c	45c	35c	45c	30c	40c	35c
Gould & Curry	6¾	5¾	5¾	4¾	6	5¾	5¾	5¼
Hale & Norcross	8¼	7¾	7¾	5¾	6¾	5¾	7	5¾
Hillside	1.65	1¼	1¼	1.45	1	60c	1¼	1
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	90c	....	1	90c	1	90c	1.30	1
Julia	2.30	2	2.30	1.80	2.05	1¼	1¾	1.55
Justice	2.30	2	2¼	2	2.40	1.65	1.80	1¾
Jackson	....	....	....	....	3	....	2.90	2
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4	3¼	4	3¼	3.90	3.60	3¾	3
Kossuth	....	....	....	....	15c	....	15c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	60c	5c	55c	40c	45c	40c	45c	25c
Lady Wash	1	75c	95c	75c	1.05	80c	85c	70c
Leopard	25c	20c	20c	15c	20c	15c	20c	15c
Leviathan	35c	30c	30c	25c	35c	30c	30c	20c
Leeds	50c	40c	40c	35c	40c	35c	50c	30c
Lee	....	....	....	....	....	....	....	....
May Belle	25c	20c	25c	20c	30c	25c	20c	....
Modoc	....	....	....	35c	....	....	45c	40c
Manhattan	1¾	1¼	1.60	....	1.70	1.50	1¾	1¼
Martin White	1.10	1	25c	1	20c	1	50c	30c
McClinton	65c	50c	65c	50c	60c	40c	50c	40c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	19¾	18¼	18¾	14¾	17¼	14¾	18	15¾
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	50c	35c	45c	35c	50c	40c	45c	35c
Northern Belle	10¾	9¼	12¾	10¾	16¾	13¼	17	14¾
New Coso	....	....	....	....	....	....	....	....
Navajo	40c	35c	35c	30c	40c	30c	35c	20c
Occidental	1.30	1	1¼	1	1¼	1	1.35	1
Ophir	19¼	18¾	18¾	16	17¾	16	20	16¼
Oriental	55c	50c	65c	55c	50c	30c	50c	30c
Overman	8¾	7¾	7¾	6	7¾	6¾	6¾	5¾
Panther	....	....	....	....	....	....	....	....
Phenix	1¾	....	....	....	....	....	....	....
Phil Sheridan	....	....	....	....	20c	....	20c	....
Potosi	5¼	4.90	5	4	4.65	4.10	4¼	3.60
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1	80c	85c	75c	85c	70c	80c	70c
Richer	....	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	7¾	6¾	7¾	6¾	6¾	5¾	6	5¼
Seg Belcher	21	19	22	21¼	16	....	....	....
Sierra Nevada	23	21¼	22¾	18	25	20¼	23¾	21
Silver Hill	90c	60c	1.45	55c	1.65	1¼	1.35	1
Silver King	7	6¼	6¾	6¼	7	....	7¾	7
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	1.20	1	1.20	1	1.20	1	1.10	1
Scorpion	3.60	3.20	3.30	3	3.30	2.90	3¼	3
Solid Silver	50c	30c	40c	35c	40c	30c	35c	30c
South Bodie	25c	20c	70c	30c	60c	40c	70c	50c
South Standard	....	....	30c	....	30c	30c	30c	25c
Stone	35c	30c	30c	25c	25c	15c	25c	....
St. Louis	25c	....	10c	5c	25c	20c	....	....
Syndicate	1¾	1¼	1¾	1.60	1.70	1.60	1.55	1.40
Tioga Con	3	2.85	3	2.70	3¼	3	3.10	2¾
Tiptop	4	3.55	4¼	4	4.40	3¾	4	4.05
Trojan	30c	25c	30c	25c	30c	25c	40c	25c
Union Con	49	42¾	43¾	38¼	37½	33	35¼	34
Utah	18	15¼	15½	12	14	12¼	13¾	12
Vermont Con	....	....	....	....	....	....	....	....
Ward	2¼	1.60	1.90	1.60	1.60	....	1.65	1.60
Wells-Fargo	15c	10c	15c	10c	10c	5c	5c	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	12¾	11	11¾	9	10	9	9¼	8¾

Sales at S. F. Stock Exchange.

Friday A. M., Feb. 13.

600 Altas.....10c
120 Addenda.....60@55c
100 Belmont.....35c
210 Belle Isle.....1¼@1.05
100 Belvidere.....1.30
300 Bodie.....8¼@8¾
350 Booker.....65@70c
105 Bulwer.....9
150 Becbtel.....2¼@2.20
140 Black Hawk.....80c
300 Champion.....55c
100 Con Imperial.....1.05
100 Con Virginia.....3¾
350 Con Imperial.....60c
270 Crown Point.....4.80@4.85
235 Chollar.....6¼@6¾
100 Challenge.....1.70
100 Caledonia.....1.05@1
480 O Dorado.....1.60@1.70
370 Exchequer.....3.50@3.60
750 Fairfax.....75c@90c
150 Flowery.....20@15c
90 Gould & Curry.....5¾
950 Golden Gate.....2.55
475 Hale & Nor.....5¾@5¾
310 Jusuice.....1.60@1.65
295 Julia.....1.60
150 Lady Wash.....80@85c
200 L Bryan.....40@45c
150 Leviathan.....35c
320 Mexican.....17@16¾
200 Mackey.....20c
25 N Bonanza.....55c
1130 New York.....40@45c
60 Overman.....62@63
510 Ophir.....19¼@19¾
100 Phil Sheridan.....20c
155 Potosi.....4.15@4.10
15 Savage.....6
300 Silver Hill.....1.35
275 Sierra Nevada.....22@22
620 Solid Silver.....30c@35c
230 Scorpion.....3.05@3¼
50 Utah.....13
310 Union Con.....34¼@34¾
3400 Wells-Fargo.....5c
40 Yellow Jacket.....9¾

AFTERNOON SESSION.

200 Albion.....25c
1545 S Bodie.....55@50c
230 S Bulwer.....1.60@1.65
250 Star.....25c
100 S Noonday.....1.70
30 Summit.....1.05
30 Silver King.....7
100 Tiptop.....4.05
200 Tioga Con.....3¼
195 University.....20c
45 Wales.....3

Saturday A. M., Feb. 14.

100 Addenda.....60c
700 Atlas.....10c
940 Andes.....1¼
90 Alta.....4.30@4¼
100 Albion.....25c
1000 Argenta.....1@1.05
1025 Bechtel.....2¼@2.15
200 Best & Belcher.....9¾
400 Belcher.....11¼@11¾
420 Bullion.....4½
150 Benton.....2.55
100 Boston.....1.30
100 Belvidere.....1.40
50 Black Hawk.....80c
150 Belmont.....40c
60 Bodie.....8¾@8¾
70 Bulwer.....8¾@9
105 Belle Isle.....95@90c
300 Champion.....55@50c
75 Challenge.....1.70
530 Crown Point..4.60@4.55
90 Con Virginia..3.80@3.85
100 Chollar.....6¾@6¾
230 California.....3¼@3.50
380 E M Diablo.....2¼@2.80
85 Eureka Con.....16¾@16½
420 Endowment.....30@35c
300 Flowery.....20c
100 Grand Prize.....1.40
140 Con Imperial.....60c
400 Caledonia.....1.05@95c
200 Daney.....35c
150 Day.....50c
100 Dudley.....50c
665 Exchequer.....3.45
380 E M Diablo.....2¼@2.80
85 Eureka Con.....16¾@16½
420 Endowment.....30@35c
300 Flowery.....20c
100 Grand Prize.....1.40
160 Keotuck.....24
125 Kossuth.....15c
800 Leopard.....15c
350 L Wash.....80@85c
100 Leviathan.....25c
260 Martin White.....80@85c
490 Mexican.....17¼@17¾
125 Mammoth.....2¼@2.30
200 Mackey.....20c
1380 Metallic.....2¼@2.80
40 Mono.....8
670 Mt Potosi.....4@3.90
1550 N Belle Is.....40c
530 Northern Belle..14¼@16
40 N Bonanza.....50c
400 New York.....40@45c
100 Noonday.....4.05
160 N Noonday.....3
50 Overman.....6¾@6¾
50 Occidental.....1.35
50 Orient.....40c
1500 Oro.....55@60c
40 Potosi.....4
1800 Queen Bee.....25c
160 Raymond & E.....75@70c
565 South Bodie.....55@50c
500 S Standard.....25c
80 Syndicate.....1.55
10 Savage.....6¾
580 Silver Hill.....1¼@1.30
140 Scorpion.....3.20@3¼
230 S Bulwer.....1.60@1.65
375 Sierra Nevada.....23@22¾
370 Solid Silver.....30c
300 Summit.....1¼@1.05
100 Trojan.....25c
200 Tioga.....3
100 Tiptop.....4.10
165 Union Con.....35¼@35
50 Utah.....13¾
1000 Wells-Fargo.....5c
270 Wales.....3.10
240 Yellow Jacket.....9¼@9¾

Monday A. M., Feb. 16.

150 Alta.....4.30@4¼
160 Andes.....85@80c
45 Bullion.....4.45@4½
850 Belcher.....10¾@10¾
135 Best & Belcher.....9¾@9¾
260 Benton.....2.60@2.55
240 C Dorado.....1¾
405 Con Virginia.....3.65@3¾
175 Con Imperial.....60c
1320 Crown Point..4.80@4.85
165 Chollar.....6¾
10 California.....3¾
210 Challenge.....1.70@1¾
170 Caledonia.....90@80c
250 Dauey.....40c
265 Exchequer.....3.60@3.70
200 Flowery.....20c
250 Fairfax.....75c
500 Golden Gate.....2.55
100 Gould & Curry.....5¾
330 Hale & Nor.....5¾@5¾
275 Julia.....1.70@1.60
185 Justice.....1.65@1¾
50 Kentuck.....3¾
200 Lady Bryan.....30c
150 Lady Wash.....80@85c
165 Mexican.....17¼@17¾
100 Mackey.....15c
640 N Bonanza.....50c
200 New York.....45c
50 Occidental.....1.30
140 Overman.....6¾@6¾
200 Ophir.....20¼
20 Potosi.....4.20
210 Savage.....6
335 Sierra Nevada..23¼@23¾
150 Silver Hill.....1¼@1.20
200 Scorpion.....3¼
400 Tiptop.....4.05
60 Union Con.....35
10 Utah.....13¾
100 Yellow Jacket.....9¾@9¾

AFTERNOON SESSION.

2035 Argenta.....1.30@1.20
600 Alta.....4.25@4.30
700 Albion.....35@40c
750 Addenda.....60@55c
50 Booker.....65c
1035 Belvidere.....1.45@1¼
1115 Bulwer.....9
190 Bodie.....8¾
50 Belmont.....40c
20 Belle Isle.....90c
200 Boston.....1.30@1¼
200 Bechtel.....2.05
20 C Pacific.....4
520 Champion.....50c
250 D Staudard.....30c
400 Day.....60c
5 Eureka Con.....16¾
150 Endowment.....35c
295 E M Diablo.....2.70
150 Goodshaw.....35c
1000 Glynn Dale.....5c
550 Grand Prize.....1.40
380 Independence.....1.30
250 Jackson.....2¼
350 Jupiter.....2¼
150 Leeds.....30c
500 Leopard.....20c
200 M White.....1
20 May Belle.....20c
210 Mt Potosi.....3.95@4
100 Mono.....7¾@7½
620 Mammoth.....2¼@2.90
705 Metallic.....2.70@2¾
160 Northern Belle.....10
100 Noonday.....4.10
95 Navajo.....25@25c
60 N Noonday.....3
200 N Belle Is.....30c
910 Oro.....65@60c
600 Oriental.....50c
100 Orient.....40c
100 Paradise.....70c
700 Queen Bee.....25c
750 Raymond & Ely..80@70c
50 Real del Monte.....1¼
25 South Standard.....25c
505 S Bulwer.....1.60@1.65
200 S Noonday.....1¼
1230 S Bodie.....70@75c
545 Syndicate.....1¼
50 Silver King.....7
90 Tioga Con.....3@2.90
20 Wales.....3.10

Tuesday A. M., Feb. 17.

90 Alta.....4.30@4¼
350 Andes.....85@80c
55 Best & Belcher.....9¾@9¾
285 Belcher.....11
200 Bullion.....4.20
565 Benton.....2.70@2.80
325 California.....3.65@3.60
10 Con Virginia.....3¾
300 Ghollar.....6@6¾
410 Crown Point..4.85@4.80
120 Con Imperial.....65c
10 Challenge.....1.60
430 Con Dorado.....1.60
460 Caledonia.....90c@80c
100 Exchequer.....3¼@3.20
50 Essex.....2
490 Flowery.....20c
135 Gould & Curry.....5¾@5¾
350 Golden Gate.....2.55
60 H & Norcross.....6¾
260 Julia.....1.55@1.60
620 Justice.....1.80@1¾
150 Kentuck.....3
150 Kossuth.....15c
350 Leviathan.....30@35c
465 Lady Wash.....85c
265 Lady Bryan.....30@25c
100 Mackey.....20c
195 Mexican.....16¾@17
30 N Bonanza.....50c
40 Ophir.....19¼@19
55 Overman.....6¾
20 Occidental.....1.30
300 Potosi.....4
50 Savage.....5¾@6
200 Silver Hill.....1¼@1.20
245 Sierra Nevada..23¼@23¾
190 Scorpion.....3.20@3.10
450 Trojan.....30@35c
35 Utah.....13
55 Union Con.....35¼@34¾
1700 Wells-Fargo.....5c
170 Ward.....1.60
10 Yellow Jacket.....9¼

AFTERNOON SESSION.

800 Addenda.....60c
400 Atlas.....10c
1450 Argenta.....1¼@1.20
50 Albion.....40c
45 Bodie.....8¾
50 Belle Isle.....90c
700 Booker.....60@55c
420 Boston.....1.30@1.40
150 Bulwer.....9
2485 Belvidere.....1.90@1¾
350 Bechtel.....2.20
50 Black Hawk.....75c
750 Champion.....50@55c
100 Day.....60c
100 Dudley.....40c
235 Eureka Con.....15¼@15½
300 Endowment.....30c
210 E M Diablo.....2@1.95
610 Giant & O A.....6@5¾
415 Grand Prize.....1.35
100 Glynn Dale.....10c
250 Goodshaw.....35@40c
100 Hillside.....1@1.10
510 Jupiter.....1¼@1.20
150 Leeds.....50c
100 Martin White.....50c
285 Mammoth.....2¼
100 McClinton.....50c
80 Modoc.....45c
75 Mt Potosi.....3.55@3¾
1050 Metallic.....2¼@2¾
10 Manhattan.....1¾
610 Mono.....6¼@6
500 Noonday.....4
165 N Noonday.....3@2.90
30 Navajo.....20c
250 N Belle Is.....30c
100 Orient.....40c
1000 Oro.....65@70c
50 Paradise.....60c
700 Queen Bee.....25c
100 Real del Monte.....1¼
500 Raymond & E.....80c
70 Silver King.....7¼
160 Summit.....1@1.10
225 Syndicate.....1¼@1.40
200 S Bulwer.....1.60@1¼
1450 S Standard.....25@30c
1150 S Bodie.....70c
100 S Noonday.....1¾
200 Tiptop.....4.10
50 Wales.....3

Wed'sday A.M., Feb. 18.

80 Alta.....4.10
100 Andes.....85@80c
70 Alpha.....8
765 Belcher.....10¼@10¾
135 Best & Belcher.....9¾@9¾
575 Bullion.....3.60@3.55
50 Benton.....2.55@2¾
750 California.....3.55@3.60
550 Con Imperial.....60@65c
850 Crown Point..4.40@4 55
150 Chollar.....6@6¼
1160 Con Virginia..3.65@3.60
1340 Caledonia.....85@80c
100 C Dorado.....1.65
100 Essex.....2
1350 Fairfax.....75c
250 Flowery.....20@15c
510 Gould & Curry.....5¾@5¾
250 Golden Gate.....2¾
240 Hale & Nor.....5¾@5¾
110 Julia.....1.60@1¾
260 Justice.....1.60@1¼
45 Kentuck.....3¼@3¼
100 Kossuth.....15c
1840 Con Virginia.....3¾
100 L Bryan.....30c
200 Leviathan.....25c
255 Mexican.....15¼@15¾
100 Mackey.....20c
200 N Bonanza.....50c
100 Ophir.....19¼
85 Overman.....6¾@6
200 Occidental.....1
100 Potosi.....3.40
60 Savage.....5¾@5¾
210 Silver Hill.....1¼@1.20
235 Scorpion.....3@3.05
305 Sierra Nevada..21@21¼
50 Utah.....12@12½
375 Union Con.....34@34¼
100 Wells-Fargo.....5c
50 Ward.....1.60
130 Yellow Jacket.....9@8¾

AFTERNOON SESSION.

400 Addenda.....55c
1905 Argenta.....1¼@1.20
425 Albion.....30@25c
955 Alta.....10c
100 Boston.....1.35
650 Booker.....60@65c
200 Belle Isle.....1
1000 Belvidere.....1.40
240 Bechtel.....2.20@2.10
100 Bulwer.....9
2120 Belvidere.....1.90@2
270 Champion.....50@55c
210 Columbia (B H).....15c
250 Day.....50@45c
200 Dudley.....40c
1000 Endowment.....30c
40 Eureka Con.....15
600 E M Diablo.....1¾@1.70
100 Goodshaw.....35c
300 Grand Prize.....1¼@1.30
100 Hillside.....1¼

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Belcher S M Co	Nevada	21	1 00	Jan 29	Mar 3	Mar 25	J Crockett	203 Bush st
Belle Isle M Co	Nevada	1	30	Jan 27	Mar 3	Mar 25	E M Hall	327 Pine st
Belvidere M Co	California	5	25	Dec 18	Jan 27	Feb 21	C V D Hubbard	203 Bush st
Best & Belcher M Co	Nevada	17	1 00	Jan 29	Mar 4	Mar 24	W Willis	309 Montgomery st
Bodie Tunnel & M Co	California	4	20	Feb 3	Mar 21	Apr 28	A F Main	309 California st
Booker Con G M Co	California	4	20	Dec 30	Feb 4	Feb 24	W H Lent	309 Montgomery st
Bullion M Co	Nevada	13	50	Jan 26	Feb 28	Mar 17	J M Brazell	328 Montgomery
Caledonia S M Co	Nevada	30	50	Jan 31	Mar 6	Mar 26	R W Avener	414 California st
Champion M Co	California	—	05	Jan 20	Mar 1	Apr 1	G C Hurlbut	525 Commercial st
Chollar M Co	Nevada	3	50	Feb 5	Mar 11	Mar 31	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	40	50	Jan 15	Feb 19	Mar 11	J Newlands	203 Bush st
Dudley M Co	California	7	25	Feb 4	Mar 8	Apr 5	E C Masten	309 Montgomery st
El Tesoro	California	8	25	Dec 15	Feb 28	Mar 20	W H Chickering	214 Sansome st
Europa M Co	Nevada	8	10	Dec 30	Feb 3	Mar 6	J L Fields	240 Montgomery st
Exchequer M Co	Nevada	15	50	Jan 13	Feb 17	Mar 9	C E Elliott	327 Pine st
Gila S M Co	Nevada	6	25	Jan 15	Feb 7	Mar 9	W W Parrish	328 Montgomery st
Gould & Curry S M Co	Nevada	37	1 00	Jan 6	Feb 11	Mar 4	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	63	1 00	Jan 14	Feb 19	Mar 11	J F Lightner	309 Montgomery st
Hillside M & M Co	Nevada	2	30	Feb 4	Mar 8	Mar 5	F Frankenthal	330 Pine st
Independence M Co	Nevada	5	30	Jan 13	Feb 17	Mar 9	E M Hall	327 Pine st
Indian Queen M Co	Nevada	3	15	Feb 11	Mar 20	Apr 12	G Adams	431 California st
Iowa M Co	Nevada	8	10	Jao 21	Feb 23	Mar 11	R L Thomas	411½ California st
Justice M Co	Nevada	31	50	Feb 9	Mar 15	Apr 5	A E Kelly	419 California st
Lady Bryan M Co	Nevada	4	50	Dec 27	Jan 30	Feb 23	—	203 Bush st
Leviathan M Co	Nevada	10	25	Feb 17	Mar 20	Apr 10	F A Frisius	330 Pine st
Mackey G & S M Co	Nevada	2	15	Jan 3	Feb 7	Feb 26	J M Buffington	309 California st
McClinton M Co	California	5	25	Feb 6	Mar 12	Apr 2	W H Lent	309 Montgomery st
Metallic M Co	—	2	25	Feb 9	Mar 15	Apr 5	—	309 Montgomery st
Mexican M Co	Nevada	10	2 00	Jan 10	Feb 13	Mar 4	O L McCoy	203 Bush st
Mountain View S M Co	Nevada	1	25	Dec 31	Feb 10	Feb 28	J Moore	309 California st
New York M Co	Nevada	21	5	Jan 26	Feb 28	Mar 20	D L Thomas	303 Bush st
North Belle Isle M Co	Nevada	2	15	Feb 5	Mar 10	Mar 31	E M Hall	327 Pine st
Potosi M Co	Nevada	3	50	Feb 5	Mar 11	Apr 1	W E Dean	203 Bush st
Raymond & Ely S M Co	Nevada	13	25	Jan 28	Mar 1	Mar 24	W L Elliott	328 Montgomery st
Savage M Co	Nevada	41	50	Feb 4	Mar 8	Mar 27	E S Holmes	309 Montgomery st
Scorpion S M Co	Nevada	6	25	Jan 6	Feb 10	Mar 2	G R Spinny	310 Pine st
Senator M Co	Nevada	1	10	Dec 22	Jan 24	Feb 21	L Reynolds	317 Mission st
Sierra Nevada S M Co	Nevada	61	3 00	Jan 6	Feb 11	Mar 3	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	9	50	Jan 2	Feb 5	Feb 26	W E Dean	203 Bush st
South Bodie G M Co	California	2	10	Jan 16	Feb 18	Mar 10	—	309 Montgomery st
South Bulwer M Co	California	6	25	Jan 20	Feb 24	Mar 17	W Stuart	320 Sansome st
Telfair M Co	Arizona	2	02	Feb 5	Mar 13	Apr 3	J Pentecost	702 Market st
Yellow Jacket S M Co	Nevada	35	1 00	Dec 19	Jan 23	Feb 23	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Ætna M Co	Arizona	1	05	Dec 23	Feb 13	Mar 6	J S Benear	420 Montgomery st
Albion M Co	—	1	10	Jan 15	Feb 27	Mar 28	—	7 Stock Exchange
Arizona Concentration Co	Arizona	1	10	Feb 9	Mar 17	Apr 5	C E Travers	402 Montgomery st
Black Rock M Co	California	1	03	Dec 16	Jan 20	Feb 24	N T Root	227 Beale st
Butte Creek Hydraulic M Co	California	4	16	Dec 31	Feb 5	Feb 25	R L Taylor	230 Montgomery st
Cataract and Wide West Grav M Co	Cal	2	25	Feb 2	Mar 2	Mar 22	Wm B Lake	26½ Kearny st
Equator M Co	Nevada	2	45	Feb 16	Mar 22	Apr 12	W Willis	309 Montgomery st
Gover M & M Co	California	40	10	Dec 24	Feb 2	Mar 1	W O Wilson	402 Front st
Ivanpah M & M Co	California	1	10	Jan 19	Mar 11	Apr 1	F J Friedlander	309 California st
Jackson M Co	Nevada	11	1 00	Feb 10	Mar 16	Apr 5	C N Shaw	408 California st
Jupiter M Co	California	7	40	Jan 23	Feb 23	Mar 19	E C Masten	309 Montgomery st
Lady Emma G M Co	California	1	10	Jan 13	Feb 20	Mar 20	F R Bunker	606 Montgomery st
Leeds S M Co	Utah	1	10	Jan 17	Mar 3	Mar 31	—	7 Stock Exchange
Liberty Hill Con M & Water Co	Cal	1	50	Dec 30	Jan 16	—	J W Pew	310 Pine st
Mayflower Grav M Co	California	7	10	Jan 19	Feb 23	Mar 16	J Morizio	328 Montgomery st
Phœnix	—	22	30	Jan 19	Feb 20	Mar 26	—	7 Stock Exchange
Rocky Point M Co	California	2	10	Jan 14	Feb 20	Mar 11	A C Taylor	314 Bush st
Tuscarora M & M Co	Nevada	5	15	Jan 24	Mar 1	Mar 22	M E Sperling	309 California st
University G M Co	California	5	10	Feb 10	Mar 26	Apr 15	W L Oliver	328 Montgomery st
Western M & M Co	Arizona	2	00	Jan 20	Mar 4	Mar 25	C S Otis	203 Bush st
Wide Awake P & M Co	Arizona	9	03	Feb 11	Mar 15	Apr 3	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
American M & Dredging Co	—	E Moreau	220 Sansome st	Stockholders	Mar 8
Concordia M Co	Nevada	W J Taylor	310 Pine st	Annual	Mar 1
Esta Buena Con S M Co	—	R N Brooks	533 Kearny st	Special	Feb 21
Golden Chariot M Co	—	J M McGeoghegan	318 Pine st	Annual	Mar 1
Gold Hill M Co	—	J M Buffington	309 California st	Special	Mar 3
Isabella M & M Co	—	J Walton	309 Montgomery st	Special	Feb 27
Northern King M & M Co	—	E A Holmes	318 Pine st	Special	Mar 13
Original Gold Hill G & S M Co	Nevada	J M Buffington	309 California st	Stockholders	Mar 6
Swansea M Co	California	F N Delaney	315 California st	Annual	Feb 21

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	E M Hall	327 Pine st	20	Feb 26
Black Bear G M Co	California	W L Oliver	Safe Deposit Bldg	25	Feb 16
Bodie Con M Co	California	W H Lent	Nevada Block	25	Feb 3
California M Co	Nevada	O P Gordon	Nevada Block	50	Dec 22
Con Virginia M Co	Nevada	A W Haveus	Nevada Block	50	Dec 23
Eureka Con M Co	Nevada	P Jacobus	37 Nevada Block	30	Feb 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	30	Feb 24
Great Western Q M Co	California	A Halsey	312 Montgomery st	25	Feb 3
New York Min G M Co	—	— Leighton	327 Pine st	25	Feb 20
Ophir S M Co	Nevada	C L McCoy	203 Bush st	1 00	Jan 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Feb 12

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Feb. 12.

20 Alpha.....9
550 Alta.....4¼@4.30
200 Andes.....85c
70 B & Belcher.....9¾@9¾
600 Belcher.....11¼@11¾
350 Bullion.....4.40@4.30
450 Benton.....2¼@2.60
210 California.....3.60
393 Crown Point..4¼@4.40
190 Chollar.....6¾@6¾
200 Con Imperial.....60c
20 Confidence.....7
310 Caledonia.....1@1.05
155 Challenge.....1.65@1.70
1280 O Dorado.....1.90@1¾
550 Dauey.....35c
370 Exchequer.....2¼@2.55

120 Ophir	17@16½	20 Chollar	6½
20 Overman	6½@6	40 Confidence	7
10 Potosi	3.55	50 Justice	1.60
50 Silver Hill	1	50 Lady Wash	80c
210 S Nevada	21½@21½	20 Mexican	16
100 Savage	5½	50 Mt Potosi	2½
10 Union Con	34½	50 N Bonanza	5c
240 Wells-Fargo	5c	100 New York	25c
70 Yellow Jacket	9	10 Ophir	17½
AFTERNOON SESSION.		50 Potosi	3.80@3.85
50 Alta	3.85	20 Sierra Nevada	22½@22
150 Argenta	1.20@1.15	20 Seg Belcher	16½
20 Belcher	10	100 Star	40c
10 Crown Point	4.65	500 Trojan	37½@40c
70 Con Virginia	3.60	210 Ward	1.70@1.75
200 C F Ravine	30c	120 Yellow Jacket	9½@9

California Board—Latest Sales.

Wednesday A.M., Feb. 18.		1000 Atna	5@6c
170 Atna	5c	470 Atlanta	5c
270 Atlanta	5c	30 Alta	4.05
50 Alta	4.20@4.15	120 Andes	80@82½c
100 Andes	81c	100 Argenta	1.40
300 Argenta	1.20@1.15	60 Benton	2.30
50 Benton	2.30	75 Belcher	10½@10½
155 Belcher	10½@10½	20 Best & Belcher	82
20 Best & Belcher	9½@9½	20 Bullion	3.65
50 Black Hiller	75c	300 Curtis	9.00@95c
10 Bullion	4	150 Caledonia	80c
150 Curtis	90c	120 Con Virginia	3.65
100 Caledonia	85c@80c	120 California	3.60@3.65
50 California	3.60@3.60	100 Con Imperial	61c
20 Challenge	1.70@1.70	40 Crown Point	4.40@4.45
20 Chollar	8½@8½	100 Endowment	40c
65 Con Virginia	3.60@3.55	100 Goodahaw	37½c
100 Con Imperial	60c	30 Gould & Curry	5½
20 Crown Point	4.55@4	30 Hale & Nor	6½
200 Goodshaw	38@37½c	30 Julia	1.60@1.65
30 Gould & Curry	5½	100 Justice	1.55
10 Hale & Nor	6½	20 Kentuck	3½
70 Julia	1.65@1.60	100 Kossuth	13c
70 Justice	1.65	100 Lady Wash	80c
100 Kossuth	14c	100 Leviathan	24c
50 Lady Wash	82c	20 Mexican	15½
200 Leviathan	28c	100 Noonday	4
30 Mexican	15½@15½	120 N Noonday	3.10
120 N Noonday	3.10	20 Ophir	16½@16½
30 Noonday	4.05	20 Overman	6½
20 Ophir	16½@16½	450 Orient	45@50c
100 Phil Sheridan	21c	100 Phil Sheridan	21c
100 Senator	14c	10 Savage	5½
400 S Utah	15c	10 Sierra Nevada	21
20 Savage	5½@5½	100 Silver Hill	1.05
20 Sierra Nevada	22½@22½	400 S Utah	15c
100 Silver Hill	1	200 S Bodie	70@67½c
180 S Bodie	70c	150 Succor	14c
150 Trojan	37½@40c	100 Trojan	37½c
20 Utah	12½@12½	10 Utah	12½
20 Union	34@34½	20 Union	34@34½
20 Ward	1.65	500 Wells Fargo	4c
200 W Comstock	25c	100 Ward	1.60
20 Yellow Jacket	9½	210 W Comstock	25c
AFTERNOON SESSION.		20 Yellow Jacket	9
400 Altas	15c		

Mining Share Market.

The dnllness which bas overclonded stock transactions, and which was long since considered as extreme, is still becoming more intensified. The stringent measurcs whicb the Legislature seems determined to place upon tbis branch of busines, bas added materially to the absence of activity. But it is not only in the application of such measures to stock transactions that the inertness of tbe market may be attributed. Tbere appears to be danger that some enactments may be passed wbicb will affect the interests of stockholders and depreciate the value of mining securities, making them burthensome to hold. While these measures are in abeyance, the condition of doubt and uncertainty precludes any marked vitality.

The sales have been exceedingly ligbt, witb no pronounced advance in figures, tbe general range tending to a falling off in prices.

Some little spurts have occurred from reported strikes, but nothing of tbis kind can be permanent until full confidence is restored by a settled status in our laws.

Bullion Shipments.*

Since our last issue, we bave noticed tbe following bullion sbipments :

Belmont, Feb. 2, $2,415.12; Alexander, Feb. 2, $3,199.96; Feb. 4, $3,593.06; Feb. 6, $2,354.81; Ontario, Feb. 10, $5,663.68; Feb. 11, $5,742.58; Feb. 12, $5,624.74; Feb. 14, $3,987.51; McCormick & Co., received Feb. 9, $6,950; Feb. 10, $8,900; Feb. 12, $6,750; Feb. 14, $10,700; Richmond, Feb. 10, $13,072.09; Horn Silver, Feb. 9. $7,500; Feb. 12, $12,000; Stewart, Feb. 9, $11,000 ; Paradiee, Feb. 10, $2,500; Feb. 11, $3,880.74; Christy, Feb. 13, $5,697; Feb. 11, $2,187.21 ; Tombstone, Jan. 31, $1,703.15; Feb. 1, $1,525.79; Corbin, Jan. 31, $1,715.34; Feb. 1, $1,668.10; Northern Belle, Feb. 11, $6,063.26; Eureka Con., Feb. 13, past 7 days, 221,485 lbs ; total for 1879, $2,767,600; Argenta, Feb. 16, $15,500; Wells, Fargo & Co., at Eureka, Feb. 14, $1,000; Germania, Feb. 14, $1,450; Salt Lake City, Feb. 13, one week, $102,933.

*Desiring to make our list of Bullion Shipments as complete as possible, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

THE U. S. troops were enticed into an ambush by hostile Indians in New Mexico, near the San Andreas mountains, and severely handled. They were subjected to a murderous fire, and were compelled to retreat with loss of rations and bedding. The Indians drove the troops across the river witb a severe loss in numbers.

THE Superior Court in banc has decided tbat the ordinance known as the "Dive Ordinance," whicb forbids women to attend in saloons under certain conditions, ie in conflict with tbe clause in the Constitution which declares that no distinction shall he made between tbe sexes in the matter of legitimate employment.

THE wbite steerage passengers of the *City of Peking* were released from the quarantine hulk at San Francisco Feb. 17tb. The Chinese remain.

A MONUMENT is to be erected in Westminster Abbey to Prince Louis Napoleon.

Mining Summary.

The following is mostly condensed from journals published in the Interior, in proximity to the mines mentioned.

CALIFORNIA.

BUTTE.

SPRING VALLEY.—Chico *Record*, Feb. 14: Is cleaning up all the bedrock now exposed in the claim, preparatory to the transfer of the property to the new syndicate. The amount of bullion, when they get through with this clean-up, will astonish everybody in its mammoth proportions. It is the intention of the new company to create another outlet for their tailings by boring a tunnel through the mountain and carry their tailings to the west branch of the Feather river, 15 miles above Oroville. This tunnel, it is estimated, will take 100 men two years in its construction, but when finished will give them much better facilities, as well as a greater fall from the mine. A new water ditch is also in contemplation which will add materially to the working force to be employed.

CALAVERAS.

A NEW CLAIM OPENED.—Calaveras *Chronicle*, Feb. 14: Work has been commenced in the McCann hydraulic on Tunnel ridge, under the auspices of the new proprietors, Messrs. Emerson & Kendall. Four hundred inches of water are used and a full force of hands is employed.

EL DORADO.

GROSS.—Placerville *Mountain Democrat*, Feb. 14: With 10 stamps the ledge (or quarry) matter was tested for three months, the profit amounting to full 50% of the gross product. Twenty new stamps were put in, and when the 30 got to work, Mr. Gross estimates that the net yield will amount to $1,800 a week. The amount of material that may be cheaply taken out and milled is enormous. There is a mountain of it.

FRESNO.

PLACER MINING ITEMS.—Fresno *Republican:* Thie has been a remarkably good year for placer mining in the river bed. With the exception of one or two rises, the water has been lingering at and below low-water marks, enabling gold seekers to invade and work the very bottom of the stream, turning the current at will. The river is mainly infested with Chinese miners who, with pan and rocker, succeed in gleaning the river bed of its precious deposits. They are miscellaneously distributed up and down the river a distance of 20 miles. A company of 20 Chinamen recently completed the working of a claim in the river about eight miles above Millerton. The Superintendent, who speaks very good English, reports the following result: Cold taken out, $5,000; expenses, $1,500; time, two months. Recapitulation: Net earnings, $3,500; dividend to each, $175; or over $87 per month. Similar statistics have been obtained from other Chinese companies, but this one is above the average. Besides these Mongolian gold seekers, there are several American companies and individuals mining the river. Donahoe & Co. have, this winter, constructed a huge dam across the river about 20 miles above here. The dam was completed prior to and withstood the recent winter freshet. The place they propose to work has long been known for its flatteriug prospects for gold. Indians have been known to dive down and bring good pay dirt from the surface of the claim.

INYO.

LUCKY JIM.—Inyo *Independent*, Feb. 7: Is said to be turning out more ore and looking better tban at any time for several years. Its developments are of such an encouraging character that Supt. Williams, who is now down at the Bay, strongly recommends that the company sink a new working shaft, by which, with other advantages, two handlings of the ore can be saved. The new shaft will be 400 ft in depth to reach the lower levels.

MURDOCK.—The parties operating the Murdock mine and furnace shipped 27 tons of bullion, worth $340 per ton; in a few days more another lot will be ready, making enough in all to pay off every dollar of the company's indebtedness, at least to the creditors who are operating the mine for that purpose. A few men in 11 days took out ore enough to keep the furnace running for 25 days, and, from present indications, can continue doing so at the same fate indefinitely. Tbis tbey are doing, and tbe furnace is still running.

CUETER.—Is being re-opened, witb very fair prospects.

MARIPOSA.

CRANBERRY.—Mariposa *Gazette*, Feb. 14: On the Merced river, two miles above the Ferguson mine, is said to be developing some rich ore. A mill is contemplated soon to be erected, which promises an outlook of prosperity in that section. Mr. Craig, one of the owners, we believe, ie prosecuting the work.

SOUTH HITE.—Is prosecuting tbe work in sinking shafts, running tunnels, etc.

MONO.

NOONDAY.—Bodie *Free Press*, Feb. 12: The crosscut on the 400 level is in 150 ft east. The crosscut east from the 500 level is in 150 ft. No. 1 vein has been cut in both of these levels. The winze on No. 5 vein, 300 level, is down 60 ft, the vein continuing strong and looking well. The upraise in No. 1 in Noonday is up 110 ft. The upraise from No. 2 North Noonday is up 145 ft; the connection will be made with the 500 level in a few days. Have connected vein No. 1, on the 300 level, with the winze near the old Noonday shaft, which insures perfect ventilation in all stopes in the mine.

BELVIDERE.—The north drift, 400 level, is now in 66 ft, and the west crosscut 36 ft. At a point 100 ft north of the shaft, east and west crosscuts will be run. The winze which had been started in the south drift, 60 ft south of the shaft, on Monday night made connection with a north drift from a west crosscut that the Bulwer company had run over into the Belvidere ground, this crosscut being the one run from the 433 level of the Bodie mine. The course of the ledge will carry it off Belvidere ground into tbe Bulwer in something over 100 ft, so the Bulwer company now have to run this drift south and into their own ground. The connection secures thorough ventilation to the mine, as well as a means of outlet in the event of accident. At the point where the south drift is started, the ledge is 30 inches wide, of clean ore. An upraise has been started near the top of the winze, to determine tbe extent of the ore body. The ledge is one of great size and strength, being fully eight ft wide of ledge and ledge matter.

BULWER CON.—The nortb drift on the Ralston ledge is in 49 ft. The ledge in the face of this drift is three ft wide of good ore. The south drift is in from the tunnel 57 ft. The ledge in this drift is three ft wide and looking well. The north drift on the Stonewall ledge has a total length of 55 ft, with a ledge in the face 18 inches wide of good ore. The south drift is in 51 ft. The ledge in this drift is two ft wide. The stopes on the Ralston ledge are looking well, the ledge being three and a half ft wide, of high-grade ore.

STANDARD CON.—The main shaft has reached a depth of 786 ft. The bottom is at present in hard rock. The north drift from the east crosscut, 500 level, is in 25 ft, showing a ledge two ft wide of good ore. The north drift, 385 level, is in from the main east crosscut 952 ft. The ledge at this point is four ft wide, of good milling ore. The south drift is in 336 ft from the crosscut, with a ledge in the face two and a half ft wide, of good ore. An upraise has been made on the Cook ledge, which is now 17 ft above the drift. The ledge here is four ft wide, and is looking well. The nortb drift on the east ledge, 300 level, shows a ledge two and a half ft wide, of rich ore. The south drift from the west crosscut is in 172 ft. The ledge in this drift is three ft wide, of rich ore. The north drift, 550 level, is in 67 ft, with a vein in the face four ft wide, of good milling ore. In the north drift, 385 level, the ledge is 25 ft wide, and yields high-grade ore. The West Standard stopes continue to look well, the ledge being four ft wide, of rich ore. In the stopes on the Cildea vein the ledge is three and a half ft wide, and looks well.

QUEEN BEE.—The north drift, 400 level, is in 70 ft. The ledge in the face has improved materially during the past week. It is six ft wide, of a very fair character of ore. In the level above, improvement was shown in drifting in the same direction, but not in the same degree as on the 400.

JUPITER.—The flow of water in the 600 level has so far decreased that it has been regarded as safe to begin operations there. Work has been resumed in the west crosscut from the end of the main south drift, 275 ft south of the shaft, which is now in 65 ft. A west crosscut has also been started from the southwest drift, 150 ft southwest from the shaft.

SUMMIT.—The north drift, 530 level, has a total length of 84 ft from the shaft. The ledge in the face is two ft wide. The south drift is in 95 ft. The ledge here is three ft wide.

SOUTH BODIE.—The boiler and pump at the 300 station are set and started up. The machinery works smoothly all around, and the company will soon have the water out and be able to test the new find, which there is reason to believe will prove to be a good ledge.

DOUBLE STANDARD.—The north drift from the east crosscut, 200 level, has a total length of 111 ft. The south drift, same level, is now in 130 ft.

UNIVERSITY.—The work of sinking the new shaft is being pushed vigorously, being now down 320 ft. The rock is hard, but blasts well. Large seams of clay and quartz are appearing, and a favorable change of ground is looked for.

DUDLEY.—The main west crosscut, on the 500 level, is in 245 ft. The ground is somewhat harder, being now a heavy block rock, full of clay seams. There has been a regular improvement in the formation as the work progresses.

BODIE BLUFF CON.—The usual progress has been made the past week in the incline, which is still following the footwall. The vein is widening and improving in quality of ore.

SOUTH NOONDAY.—Bodie *News:* Shaft down 152 ft. Numerous small strata of quartz and clay, rich in free gold, are continually coming into the shaft from the west. The seam of rich ore cut last week has passed out and is now on the east line of the shaft; at the depth of 150 ft a station set is being put in place, preparatory to cutting the station and running a crosscut to the Cummings ledge, that is expected will be found within 25 or 30 ft of the shaft.

SOUTH BULWER.—Sinking the main double-compartment shaft and making good progress. Total depth, 500 ft. Ground in the bottom, birds-eye porphyry, very hard, but of a favorable character. Pumps are working well and handle the water easily. Sinking is now being done with Burleigh drills, which are doing good work and expediting the sinking very much, a vast improvement over hand drilling.

STANFORD CON.—The shaft is 300 ft deep, double compartments and timbered the whole depth. At the bottom a station has been opened and crosscuts east and west are being pressed rapidly. The west crosscut is now in 115 ft. The east crosscut has a total distance of 145 ft. The rock soft and indications favorable. The face of the crosscut is a solid body of clay and quartz.

BOOKER.—Bodie *Chronicle:* The south crosscut on the 300 level is in 230 ft from the shaft, and looking well, the vein being 20 inches wide and dipping to the east. A crosscut has been started ou tbo 400 level.

NEVADA.

GENERAL GRANT.—Truckee *Republican*, Feb. 14: It was located last January, on the other side of the lake, by Capt. W. W. Lapham, and has been incorporated—the capital stock being fixed at $15,000,000, divided into 100,000 shares. Specimens have assayed as follows: No. 1. $3,010; No. 2, $3,016; No. 3, $1,809; No. 4, $1,294. But of course these are very rich specimens, and not an average. Out of ten pieces of rock picked out promiscuously, the average was $107, which shows a remarkably rich mine.

EL CAPITAN.—Nevada *Transcript*, Feb. 14 : A 50-inch ledge of ore, rich in sulphurets, was struck in the 150 level, 110 ft south of the incline. It bas been opened for 10 or 12 ft, and is regular in quality and widening. It runs in a southerly direction and pitches east.

RICH STRIKE.—W. M. Kirkham and Wm. Hitchcock, who have been working near the Mt. Vernon House, a mile north-west of Blue Tent, report a rich strike. Their shaft is down 36 ft on a ledge a ft tbick, from which they are getting $100 worth of gold a day by using a hand mortar. They think the ore will pay $2,000 a ton, and say it is of even grade as far as developed. There is considerable excitement in that neighborhood over the strike.

FORTUNA.—The new shaft has reached a depth of 30 ft, and contains three compartments, the total dimensions being 10 by 14 ft, and well timbered.

NEW OPHIR.—Is the name under which the old Allison quartz mine on Selby Flat, recently re-located by Messrs. Eddy, Hicks and Rodda, now goes. Some very rich specimens continue to come from the workings, and they think they have a good mine. They have purchased an arastra, hurdy, etc., from tbe Mitchell, Martin & Co. claim on Canada hill. They have taken out 20 tons of good-looking ore that shows well in gold.

UNION.—Is situated west of and near tbe Banner. Fifteen years ago it was a good producer. The ledge was worked out at a big profit near the surface, an incline 300 ft deep was put down, then water came in too fast for the machinery in use. It originally sold for $15,000, but for the past 13 years it has remained at a standstill so far as any developments by the purchaser—John Parrott, of San Francisco, are concerned. Five years ago it was relocated, and enough work has been done to comply with the law to entitle the re-locators to its ownership. They have sunk a shaft, and are now engaged in running for the ledges, of wbich there are two, one being about three ft thick and tbe other smaller. It is stated that Mr. Parrott proposes, in case they make a rich development—which they are likely to do at most any time—to use for recovery of the claim. They are confident they can hold it in spite of all bis efforts. There promises to be a lively contest as to their respective rights, in case Mr. Parrott's intentions are correctly represented.

WASHINGTON ITEMS.—The mines in this district at the present time are looking exceedingly well. The Yuba company are running their main tunnel ahead rapidly. The ledge is seven ft wide, and ehows gold in every inch of it. They have 200 tons of rich rock on the dump, and will start the mill running as soon as the weather will permit. The company are preparing to erect sulphuret works in the spring. The Lindsey mine is looking well. They have a 9-ft ledge that promises to be the mother vein of this belt. The mill has not been running regular this winter on account of the cold weather. Cole & Mead have four locations on the same range, and are preparing to erect a 10-stamp mill in the spring. Wing and Freeman have a good mill on Alpha hill, and soveral other mines in this vicinity are being worked.

ALPHA.—Grass Valley *Union*, Feb. 14: It is on a parallel vein to the Idaho, lying north of it on the opposite side of Wolf creek. The new steam hoisting works were started up last month, and the work of sinking the shaft has gone to a depth of 90 ft. The ledge bas a width of from 18 inches to 2 ft, and shows well in fine free gold and heavy sulphurets. From cuts and shaft, to the depth of about 60 ft, the rock yields from $17 to $28 per load. The shaft will be sunk to a depth of 120 ft before drifts are started, when there will be backs sufficient, with a strong ledge, to turn out regular crushings.

ROCKY BAR.—The new quartz mill has started up, and contains two batteries of five stamps each, the stamps weighing 800 pounds. Each battery is supplied with quartz by self-feeders. In addition to the copper plates and blankets used below the batteries, there are two Eureka rubbers, five Hendy concentrators and two grinding pans, which gives all requisite machinery for amalgamation, and the concentration and saving of sulphurets. The mill starts on a run of 300 loads of rock, and no clean-up will be made until it is crushed. The extraction of quartz will go on. A contract for sinking the main incline 75 ft deeper has been let.

PLACER.

SOUTHERN CROSS.—Dutch Flat *Forum*, Feb. 12: The blast of 8,500 pounds of Judson powder did good execution. The drift extended in the direction of town. The first clean-up of the season at this mine will be made the last of this week.

TULARE.

EMPIRE.—Visalia *Delta:* Has struck a body of rich ore in shaft No. 3, which increases in richness as it goes down. All the available force is now working on the upper levels, but operations will soon be resumed on the lower tunnel, which it is estimated will strike the ore body by running about 160 ft further. They will start the mill again in two or three weeks. There has been no general clean-up although a quantity of amalgam is on hand. A few bars of bullion were run for samples. We have seen one valued at $433. It is now demonstrated that the Empire is free-milling rock.

TUOLUMNE.

CONTINENTAL.—Tuolumne *Independent*, Feb. 14: It i situated on the south bank of the Stanislaus river, a quarter of a mile from the U. S. Grant mine in an easterly direction. It was bonded for $10,000 by a San Francisco company two months ago, and is now in process of development. Work on the shaft is being pushed rapidly; it is now down 75 ft. The vein is well defined, with favorable showing. It having an altitude of 2,000 ft above the bed of the river, no great length of tunnel is required to tap the vein 800 or a 1,000 ft deep. The character of the ore is like that of the Riverside, which is a parallel vein.

RIVERSIDE.—Driving the new level, with the aid of the Burleigh drill, is progressing rapidly. This level will tap tbe vein 450 ft below the old stopes, and is 100 ft above the bed of the river. Length of tunnel to reach the vein, 400 ft. When completed, miners will be set to work extracting ore, and the 20-stamp mill put in operation. The tunnel will give drainage to the mine, by which all difficulties arising from seepage water will be obviated for years to come, and also make available hundreds of thousands of tone of good milling ore.

KELTZ.—Discovered in 1862 by Keltz, who located and immediately commenced operations towards developing it. The lead opened out very encouragingly. After sinking a few ft on the vein he (Keltz) was offered $30,000 for the mine, on these conditions: The purchasing parties reserving the privilege of sinking 60 ft on the vein, and if the prospect held good at that depth, the $30,000 to be paid over and transfer made. Keltz, however, holding out for $50,000 caused tbe negotiating party to withdraw their offer. This mine has changed owners a number of times. The shaft, commenced by Keltz, was sunk in after years by Brodigan to a depth of 60 ft, when the vein was found to "pinch out." Another shaft, 20 ft from this, was sunk in '64 and '65 by a San Francisco company, when, at a depth of 40 ft, the vein pinched out. The working shaft is down 220 ft, at which depth the vein is three ft thick, and showing greater permanency as work progresses. Three levels, Nos. 1, 2 and 3, with headings, respectively, 40, 70 and 80 ft north; 60, 50 and 100 south. There is a 20-stamp mill, having all the latest improvements, hoisting works, and, in the mine, a large force pump. In connection with these improvements, there is a Blondin railway. This consists of an iron car, which traverses a wire cable 800 ft in length, suspended 300 ft above the gulch, by which means the ore is transported from mine to mill. The mill is working with good results.

ITEM.—We notice on Gold hill (formerly called Piety hill), near the Rodgers' mine, that active work is going on upon the claim of Mr. J. S. Cady. A very substantial whim is being erected, and the same is being covered by a good roof. Every evidence of an energetic and active prosecution of the work of developing this promising claim is to be seen in the improvements going on. In the Rodgers, Ferguson & Co.'s mines the hoye are putting in their best licks—all "going for" the Clark, Divoll & Co.'e bonanza.

MT. JEFFERSON.—Sonora *Democrat*, Feb. 14: The sulphurets assayed at the United States mint yielded $19,800 per ton. The streak from which they were taken ie about five inches in width. That is wide enough for a fortune, if it will hold equally as rich as that assayed. Beside the streak, there is other rich ore in tbe mine.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Feb. 13: A good etart bas been made in sinking the incline below the 2500 level. Good progress is made in the drifts east and north on the 2500 level. The former is in 64 ft, and the latter in low-grade quartz and 175 ft from the incline. The main pumps are running to this level. On the 2300 level the north drift in the Hardy vein is in low-grade quartz, its face 80 ft from the main east drift. The joint Mexican east crosscut on this level is in 37 ft. The north drift in the Hardy vein on the 2200 level has found milling ore. This came in about 70 ft from the southeast drift and still continues. The south drift in this veiu is in 45 ft. The east crosscut from the end of the north drift in the Hardy vein, 2100 level, and 40 ft beyond the stopes, continues to out a fine vein formation carrying rich ore in streaks and bunches; total length, 25 ft. A winze has been etarted 40 ft south of the main east drift on this level and in the Hardy vein to connect with the workings on the 2200 level.

SIERRA NEVADA.—The winze from tbe 2400 level, and 145 ft north of the incline has been sunk perpendicularly 46 ft, cutting 16 ft of good ore, and then turned into an incline and continued in fine ore eight ft. The north drift on the 2400 level is now in 305 ft and passing through quartz giving low assays. When the crosscut east ou the 2300 level, and 400 ft north of tbe east shaft, was in 00 ft it struck good milling ore for nine ft, tben vein porphyry.

CON. IMPERIAL.—Connection was made between tbo south drift, 2300 level, and the drift north on the 2700 level of the Yellow Jacket and good ventilation afforded on the lower levels of the mine. Running north on the 2300 level is now in order. The joint Alpha winze from the 2600 level is down 200 ft on the slope.

CHOLLAR.—The south drift on the 2400 level is in from the main west drift 160 ft. The west drift has attained a length of 670 ft and showe indications of nearing the ledge, as promising stringers of quartz bave been cut through.

UNION CON.—The main drift east from the stopes on the 2400 level has attained a length of 324 ft from the shaft. It will be a week or more before the winze can be started from its extremity for the 2500 level. The shaft will be started down at the same time. The southeast drift on this level is in from the east drift 75 ft. The drift east from the Union shaft is in 180 ft.

BELCHER.—Cutting out a station on the 2760 level for a winze to the level below. On the 3000 level, work is being shoved. A diamond drill was run 35 ft east in search of water, but the drift will now be sent in to prospect the ore vein in that direction. The south drift is in 155 ft.

CALIFORNIA.—The main south lateral drift, on the 2450 level, is in from the Ophir line 130 ft. The crosscut east on the 2250 level shows signe of approaching the ore vein encountered on the 2150 level; total length from the main lateral drift, 53 ft. On the 1500 level and in the west crosscut toward the old stopes, fino vein material le encountered.

LADY WASHINGTON.—No. 4 crosscut on the 1550 level has been pushed to the ledge. It gave low assays for over 60 ft, and then entered quartz which assayed from $17 to $30 and at the same time struck water and was stopped.

BEST & BELCHER.—East crosscut, 2150 level and joint with Con. Virginia, is cutting a soft vein formation which requires timbering; total length, 85 ft.

OVERMAN.—The crosscut east on the 1900 level has of late been cutting some very hard quartz, carrying some precious metals and looking well.

SCORPION.—Opening up the station at the 500 level, preparatory to prospecting the ledge. The sump has again cut into softer vein matter carrying some water and looking well.

CROWN POINT.—Crosscutting etill on the 2700 level joint

CONTINUED ON PAGE 124,

The Recent Experiments of Levy and Fouque'.

Some Remarks on the Study of Rock Genesis.*

[By A. W. Jackson, University of California, Berkeley.]

MM. Levy and Fouque' have recently published in the *Comptes Rendus*, Novemher, 1878, the results of their experiments on the reproduction of certain important rock-forming minerals by igneous fusion. The almost perfect success which attended their investigations, together with the important hearing of their results upon the intricate euhject of rock-genesis, induces me to give a short account of their work, which I will make the preface to eome remarks upon the study of rock-genesis in general.

Levy and Fouque' succeeded in producing, by processes of pure igneous fusion, the more important memhers of the feldspar family (with the possible exception of orthoclase), leucite, nephelite, pyroxene and magnetite, and finally mixtures of two or more of the above minerals which resemble even in their minutest detail corresponding natural products. Their firet experiments were made npon the more fusihle feldspars, oligoclase, labradorite, and albite, later upon orthoclase, microcline and anorthité. Ae materials, hoth the natural powdered feldspars and mixtnres, in definite proportions of precipitated silica, alumina, melted carhonate of potash and soda, and calcined carbonate of lime, were used, the results by both methods being identical. The materials were eimply mixed in a platinum crucible, and maintained at a temperature as little as possible below the fusion point for ahout forty-eight hours, and were then allowed to cool without further precaution. One scarcely euspected the crystalline character of the cooled mass even under the lens, hut in thin sections under the microscope the seme details, hoth of structure and arrangement, were recognizable that one meets in the natural rocks. I will give briefly the characteristic appearances which they found in the different minerals.

Oligoclase.—In microlitic crystals and fihrous, in the direction P : M, at right angles to which and normal to the brachypinacoid, is the optical normal, so that the crystale appeared dark hetween crossed Nicols when the direction of columnar development coincided with the plane of polarization of either Nicol. The crystals were mostly polysynthetic, after the Albite Law. Near the surface of the mass the crystals were very small and grouped in spherulitic aggregates, as is eometimes seen in certain massive rocks.

Labradorite.—In better crystals than oligoclase, polysynthetic like the latter, sometimes with twenty individuals entering into one polysynthetic crystal; in spherulitic aggregates, and with optical properties identical with those of the natural mineral; furthermore, glass cavities were present in abundance.

Albite.—Crystals very small, but properties entirely characteristic.

Anorthite.—Required a much higher temperature than the former, but the crystals obtained were remarkahle for their size, definiteness of form, clearness of optical properties, and natnre of inclusions. Crystals as large as 0.5 mm. by 0.2 mm. were ohtained, tahular parallel to the hrachypinacoid with extinction in the zone P : M up to 45°. The inclusions in the larger crystals were of exactly the same character as met with in nature, viz., glass cavities with buhhles, the cavities heing hoth oval in form, and as negative crystals, *i. e.*, the oavity repeating the crystalline form of the individual in which it occurs.

Orthoclase.—In no well-defined crystals, but in place of them the mass was filled with a delicate network of extremely minute crystallites, arranged in groups in such a manner that the cryetallites in each group were at right angles with each other, while the different groupe were arranged entirely irregularly with respect to one another. Each crystallite extinguished under crossed Nicols parallel to its length, and gave ite maximum of light at 45° thereto. With crossed Nicole, therefore, one could discern only a bright croee at 45° with the planes of polarization of the Nicols, whatever might be the position of the eection in its own plane. Theee crystallites could he interpreted as orthoclase, if we coneider that each is developed tahular parallel to the clinopinacoid, and eo thin ae to be unahle to depolarize light transmitted through them normal to the clinopinacoid, hut ahle to do eo in a direction parallel to this plane. The results with orthoclase can certainly not be considered so eucceesful ae with the other memhers of the feldspar family.

Nephelite.—Easily ohtained by mixing eilica, alumina and carhonate of eoda in euch proportions that the oxygen ratio of $RO : R_2O_3 : SiO_2 = 1:3:4$. The fused mase waefull of hexagonal prisms, 0.12 mm. hy 0.08 mm., eome even having the opaque central kernel eeen so often in the nephelitee of eome phonolites.

Leucite—In forms like the natnral mineral, with the characteristio optical properties, and containing glass cavities with bubhles, more frequent in the center, less frequent on the periphery of the crystals.

Mixtures of *labradorité* and *pyroxene* and of *leucite* and *pyroxene* were then fused, and the results were in the former case—a rock that resembled in the minutest microscopical detail the feldspar lavas of Ætna, so that it was ahsolutely impossihle to distinguish hetween them even in thin eections. In the latter case, the rock resembled just as closely the leucitite from Capo di Bove.

As the result of the foregoing investigation, we have certain of the most important rock-forming minerals produced for the firet time, synthetically, hy pure igneous fusion, and the synthetical production for the first time of massive rocks. Indeed, the above experiments can he looked upon as epoch-making for the science of rock-genesis, for they put it for the first time upon a true scientific basis.

In this matter of rock-genesis there are two different lines of investigation that can be brought to bear upon the euhject, viz.: *observation* and *experiment*. On the one hand, the careful examination "in place" of all of the circumstances accompanying the occurrence of any particular rock mass, its form, its contact eurface with neighhoring rock masses, changes which it may have induced in these latter, either of a mechanical or chemical nature, finally a more detailed examination of the intimate structure of the rock iteelf, as revealed by the microscope in thin sectione. On the other hand, the method by experiment, whereby we reproduce, eynthetically, by the different processes of igneous and aqueo-igneous fusion, the different minerale which participate in the formation of the rocks, and even, as we have seen in the success of Levy and Fouque', the rocke themselves.

Now I do not wish to detract in the slightest from the truly high value of these synthetical experiments in helping to unravel the mystery which for so long has eurrounded the whole matter of rock-genesis; but it seems to me that too sweeping deductions have often heen drawn from their success or failure. That they prove, when successful, the *possibility* of the formation of a certain euhstance in a given way, no one will for a moment deny. But that they prove that similar substances in nature *have been formed* in the given way must certainly be denied. Could we conduct our experiments under exactly the same conditions as we have every reason to believe often existed in nature—viz.: great heat, enormous pressure, and indefinite time—then onr experiments could he looked upon as positive arguments hearing upon the matter in hand. As it is, we never have commanded these conditions, and we can scarcely ever hope to. When successful then, our experimente can only prove the *possibility* of a certain method of action. When unsuccessful, they prove absolutely nothing.

Chemistry then can furnish ns enggestions concerning the possible processes hy which the rocke may have heen formed, which processes are then to he interpreted in the light of the phenomena observed "in place." If these speak one way, while chemistry speaks another, then certainly greateet heed must he given to the results of observation, and we must hide our time for greater certainty till chemistry can furnish results which can be hronght into harmony with the observed facts.

As you are aware, perhaps, no field of science has been the scene of more hotly contested strife than this—the genesis of the composite crystalline rocke. From the time of Werner and De Saussure, almost to the present day, the two great factions—the Neptunists and the Plutonists—have stood firmly against each other, often waging the contest with the bitterness of apparently deadly enmity. The aqueo-igneous theory has furnished a kind of middle ground that for many rocks may prove nearer the truth than either of the others. The revelations within recent years of the microscope, together with the gratifying success that has recently attended synthetical researches, are certainly throwing a great amount of light upon the questions that have been so long unsolved. It is now a fact that nearly, if not quite, all of the principal rock-forming minerals have heen produced both in the igneous and in the aqueo-igneous ways. We must betake ourselves then to the observation of the phenomena, hoth macroscopic and microecopic, which the rock preeents in its occurrence and etructure, to decide which of these theoriee is to be accepted as the true one.

It would certainly be instructive to take up each of the leading groups of the compoeite crystalline rocke and examine it in detail in the light of the reeulte referred to. Such a taek I must reserve for a future occasion however and conteut myself here with indicating, ae hriefly as poesible, some of the phenomena which throw light upon the mode in which a rock hae heen formed.

First—The *macroscopic* phenomena, or euch as are obeervahle in the field. The mechanical uptilting of adjacent horizontal heds must certainly indicate (and I am referring now only to the compoeite cryetalline rocks) that a mase has been intruded, while ahnormal contact and the inclusion of fragments of an adjacent rock must certainly indicate that the mass has been plastic. The exteneive metamorphiem of adjacent eedimentary bede ae ie observed in connection with granites, certainly euggeete the preeence of large quantities of water in the rock maes that have been discharged during the final process of solidification, for we can scarcely conceive of simple heat exercising such an influence at such great distance. Furthermore, are often formed in this metamorphic zone, hydrated minerals, although possihly of later origin, which would preclude the idea of very high temperature.

Finally, there is observed upon the contact eurfaces of other rocks the most positive evidence of a simple igneous fusion at a very high temperature—a vitrification extending not more than a few inches or a foot outward. Thie certainly pointe to an igneous fusion of the rock and the absence of any considerahle amount of water.

Second—The *microscopic* phenomena, or such as are observed in thin rock eections under the microscope. Under this head let me hriefly indicate the most important results of the microscopic investigation of rocks and the hearing of these results upon the matter in hand, viz.: rock-genesis. These are:

First—An accurate mineralogical determination of even the most compact rocke. It is certainly desireble to know *what it is* that is formed before we can speculate intelligently concerning its *mode of formation*.

Second—Concerning the structure and formation of individual granules. The *zonal structure*, often seen in feldspars, amphiboles, pyroxenes, etc., indicates successive stages of molecular activity and rest, and it has even been observed in a pyroxene crystal, where the zones were alternately brown and green, that the growth must have been at one time in the presence of oxidizing agents, and at another time in the presence of reducing agents. The *inclusions* in a crystal throw much light on its genesis. The presence of glass or stony cavities without any liquid cavities would seem to indicate that the crystal had developed out of a purely igneous fused mass. The presence of liquid and glass cavities in the same crystal suggests a process of aqueo-igneous fusion at a high temperature, while the presence of liquid cavitiee alone is evidence of the presence of a very large amount of water and not too high a temperature. Or if the temperature was high, the pressure was sufficiently great to prevent a real fusion of the rock mass. It is particularly in the granitic rocks that this last observation is made. In them, glass inclusions are never observed. I can conceive, however, of the absence of glass cavities in a granite that has, nevertheless, crystallized out from a condition of substantially igneous fusion—*i. e.*, a condition wherein the water has played a decidedly inferior role. The solidification of granite has evidently been an exceedingly slow process, because of the size the individual granules attained heforo complete solidification. The conditions would consequently he favorable for the complete assimilation of a fused magma hy the growing constituent granules, even when it constituted the greater portion of the plastic mass, while liquid inclusions would still he formed, even if hut a small amount of water were present, because of the entire absence of any tendeucy on the part of the water to assimilate directly with any one of the constituent mineral elements of the granite. When we call to mind the fact that some granites exercise a very powerful metamorphosing influence on adjacent rocks, while others exercise little, if any, it seems to me that the explanation may be found in the above suggestion.

In fluid cavities, carhonic acid and chlorides of sodium, potassium and magnesium are not infreqnently observed, proving the presence of the elements of these substances while the rock mass was melted, while the liqnid condition of the carbonic acid attests great pressure.

Third—Concerning the *growth* of crystals in an amorphous magma, *i. e.*, the study of the embryonic development, eo to speak, of crystals, both synthetically and by observing the different stages at which the crystallizing processes have been arrested, more particularly in the glassy rocks obsidian, pitchstone and the like. We have thus arrived at very valuable, and, in fact, the only sound conceptions of crystallo-genesis.

Fourth—Concerning *rock-texture*, *i. e.*, the arrangement of the mineral constituents of a rock among themselves. The observations on this head have led to a knowledge of different stages of eolidification. During the first stage certain crystals are formed and attain considerable size, the rest of the magma remaining amorphous. This takee place deep in the earth and during a period of comparative tranquillity. This period of calm ie then eucceeded hy a period of agitation, for we find the crystals broken or eaten into, ehowing powerful chemical action or a greatly increaeed temperature. The eecond etage of solidification producee a eecond crop of cryetale, which sometimee, ae in granite and allied rocks, completes the eolidification. In porphyries and volcanic rocks, however, this etage is followed hy etill a third, viz., the eolidification of the remnant of the magma as an amorphous hase. The crystals of the second stage are generally microlitic, and are probably developed during a movement of the magma; indeed, thie is often distinctly proven hy the eo-called micro-fluctuation structure.

Fifth—The microscope has shown that certain minerals, viz., lencite, tridymite, and mellilite are exclusively of tertiary and post-tertiary origin, and are never found therefore in rocke older than the tertiary.

With the aid thue of the microscope, the balance and field observation, it hae heen poeeible to ehed considerable light npon the dark places of this intricate suhject of rock-genesie. Still, even now we can feel hut tolerably certain about a few of the most general featuree of the proceesee hy which the rocks have been formed; the moet of the work in this direction belongs to the future.

*Note.—The substance of this article was presented at a recent meeting of the Chemical Section of the Academy of Sciences. It made no pretence to being a paper, but merely introduced a topic for the informatiou of the members of the section and for subsequent discussion.

Gold Discoveries in Mendocino County.

Gold was first discovered in Sanel valley hy John Knight, in 1852, from eeeing a few specks in a bucket of water from a creek near his honse, the present residence of Supervisor Fox. Thie caused him to make further search, resulting in finding the color in several placee prospected during that and the following year.

In 1854 he showed Smith D. Towne and others, from Petaluma, a emall creek coutaining gold, from which they extracted ahout $8 in a few hours. This was the year that Sam Kelsey, of Sonoma, circulated a rumor of his having found rich diggings on Russian and Eel rivers, thereby inducing a number of men to accompany him on a mining expedition through that region to Cottonwood creek, where they broke up disgusted, hating and accnsing their leader of falsehood and deception. Neither that nor any other company, within the knowledge of tbe writer, has ever prospected the Russian river region thoroughly.

The recent discovery in Sanel valley was mede hy Arthur Daw about the first of last Decemher, in a low range of hille one and one-half miles east of Hopland, on the lands of Orrin Howell. The top of this range ie ahont 180 feet above the level of the valley, and has little rills or rivulets running down its sides, that contain water only during rain etorms, consequently cannot be of any use for mining. The mineral, so far as discovered, is confined to the eastern elope of these hills, principally to the rivulets mentioned. One of these rivulets, eupposed to be the richest, has been prospected slightly with a pan and rocker to the depth of two feet, yielding from three to ten cents to the pan, out of sand and gravel from the bed of the creek.

The eoil of the hill slopes, and is of that reddish cast usually found on Russian river. The sand and gravel ie very compact and heavy, containing iron; the rocke are generally small and round, euch as miners call small boulders. There is no indication of ledges, or bedrock, on the eastern slope of the ridge, although on its top a showing of streaks of quartz mixed with other rock, may he, crops out, the top of a ledge. The gold is very fine, hut not what is called float or scale gold, and is intermixed with emall quantities of platina and iridium, with a large amount of hlack sand. Gold is found in several places over an area of two miles long by about one-third of a mile wide. A few days ago eome very good prospects were found on W. Willard'e farm.

The owners of the Hopland mine dug a ditch about two and one-half miles long, from a emall creek in the vicinity to their diggings, and turned the water into it, which was found to he sufficient for a sluice head. They now contemplate huilding a reservoir to save the water running from the dam at night for use in the daytime, which probably will give them enough to test their discovery thoroughly. The mountains surrounding Sanel valley have the same indications of mineral as the hills near Hopland, giving a strong hope of further and richer discoveries than those already made. Men who are not afraid of work might do well here; hut gassy hummers would starve to death.—*Cor. Ukiah Press.*

The Precious Metals.—From the earliest times to the commencement of the Christian era the amount of the precious metals obtained from the surface and mines of the earth is estimated to be $4,300,000,000; from the latter epoch to the discovery of America, $4,400,000,000 were ohtained; from the date of the latter event to the close of 1842, an addition of $8,500,000,000 was ohtained; the extensive working of the Russian gold mines in 1843 added to the close of 1852, $1,400,000,000 more; the quadruple discovery of the California gold mines in 1848, those of Australia in 1851, of New Zealand in 1861, and the silver mines of Nevada in 1851 added, to the close of 1879, $6,800,000,000, making a grand total at the present time of over $25,000,000,000. The average loss by ahrasion of coin is estimated at half of one per cent per annum; and the average loss by consumption in the arts, and destruction by fire and shipwreck, at $7,000,000 per annum. The amount of the precioue metals now in existence ie estimated to he $13,000,000,000, of which gold furnishes $8,000,000,000, and silver the remainder. Of the amount now in existence, $9,000,000,000 are estimated to he in coin and hullion, $3.000,000,000 in watches, and the remainder in plate, jewelry and ornamente. Of the amount now in existence, $8,000,000,000 are estimated to have heen obtained from America, $2,000,000,000 from Asia (including Australia and New Zealand), $2,000,000,000 from Europe, and the remainder from Africa and Oceanica.—*D. M. Balfour, in New York Economist.*

Gold Yield of New Zealand in December, 1879.—The number of tons of ore crushed during the year wae 2,611; ouncee of gold ohtained, 7,764. The product for the past four yeare ie:

	ozs.	Value.
Gold yield for 1876	68,519	£160,027
" " 1877	132,370	£364,017
" " 1878	60,602	£166,655
" " 1879	49,853	£130,000

Light Yields.—The product of the principal minee in Nevada county for Decemher were lighter than usual, as follows: Idaho, quartz, $29,600; Milton, gravel, $21,500; North Bloomfield, gravel, $30,000; Pitteburg, quartz, $4,300.

Coal Trade of Seattle, W. T.

The Seattle *Intelligencer* makes this report for 1879:

January	10,932 tons.
February	11,319 "
March	12,912 "
April	14,397 "
May	13,176 "
June	9,870 "
July	8,297 "
August	6,011 "
September	14,372 "
October	9,898 "
November	12,332 "
December	8,747 "
Total	132,263 tons.

All this coal went to San Francisco except that of a single small vessel (the bark *Gem of the Ocean*) which went to the bottom of the sea. All of it also, as was likewise the case in 1878, came from the mine of the Seattle coal company at Newcastle. The coal trade of Seattle has attained its enormous proportions in less than nine years, and against obstacles of a more stupendous character than have been encountered at any other place on the coast. In 1871 the first coal for export and trade was placed on board ship in this harbor, and during the ensuing four years what were in those days considerable quantities followed, reaching tidewater in scows and over wooden tramways, and by river and lake and portage and what all only those engaged in the transportation have anything like an accurate idea. To give our readers an idea of how the industry has been pushed, from the beginning to the present time, we subjoin the following table:

1871	4,918 tons.
1872	14,830 "
1873	13,572 "
1874	9,027 "
1875	70,157 "
1876	112,734 "
1877	104,556 "
1878	128,582 "
1879	132,264 "
Total	590,639 tons.

Of this immense quantity sent abroad by ship, 33,419 tons were from the Renton mine, 23,426 tons were from the Talbot mine, and all the rest (533,794) was from the Seattle mine. Of the coal above referred to all but ten or fifteen thousand tons went to the bay of San Francisco. A few small cargoes went to Honolulu and the southern coast of California, and a few more (those of the ill-fated *Osmyn, Western Shore*, etc.) were lost in the ocean. The future of Seattle's coal trade can only be conjectured. We may rely upon one thing, however, and that is, as the demand increases our mines will be ready with the supply. We have several varieties of coal within our county limits, and a quantity that can not be estimated short of hundreds of millions of tons.

The Longfellow Copper Mines.

We extract from the Globe (Arizona), *Silver Belt*, the following interesting statement: Mr. Wendt, a practical miner, and mining engineer of New York, visited the mine a few weeks since, and after a careful examination, at a low estimate, placed the amount of ore actually in sight at 50,000 tons, averaging 25% with a reasonable calculation of finding as much more by displacing that already exposed. With these figures we deduce the following: Fifty thousand tons of 25% ore will yield 12,500 tons of copper or 25,000,000 pounds and at the present price of copper, 23 cents, $5,650,000. The company expect this year to produce 4,500,000 pounds of pig copper, which, at the above rate, will give $1,035,000; hence, it is clearly to be seen that the Longfellow is not only a wonder, but is one of the most productive and best paying mines of America.

The company employ directly about 500 men, and indirectly, including charcoal burners, freighters, etc., 1,000, in all about 1,500, and the operations of this one mine alone give daily bread to over 2,500 people.

There is in transit to the railroad over one half million pounds of copper from this mine, and two freight wagons are daily loaded at the furnace, with 8,000 pounds, which amount it is the intention of the company to increase to 12,000 or 15,000 pounds. Eight thousand pounds of copper per day, with the enormous amount of merchandise sold by the company, net to it over $1,000 per day. Mr. Wendt gives it as his opinion, that the mine is a true fissure vein, and that the heavy body of ore is to come from below.

The Longfellow company have built and stocked a narrow-gauge 20-inch railroad nearly five miles in length from the mine to the furnace, at a cost of about $75,000. It is complete in every particular, with the exception of an engine, which has been ordered and will be on the road in a few weeks. The rolling stock at present consists of eight cars of three tons capacity each, and are hauled by mules from the furnace to the foot of the mountain, where the ore is lowered from the mine by means of a tramway 1,600 feet, and a chute 480 feet. From here the grade of the road is sufficiently descending to carry the train back to the furnace of its own specific weight.

A Canadian Gold Mine.—A bar of gold weighing 235 ounces, valued at about $4,600, from the Skerry & Kennedy ledge, at Montague, is the result of three weeks' work of 14 men.

Useful Information.

Hardening and Testing.—To *really test* the hardness of the surface of metal, we must take a *new*, or at least a good, *dead smooth* file and apply one corner of it to a corner rather than on a flat surface of the metal to be tested, pressing the file very firmly against the work. A coarse file, even if a new one, is useless to test with. The greatest degree of hardness is obtained by plunging the red-hot steel into mercury. Steel hardened from the surface inward is hardest on the surface, while in steel that has been tempered the exterior is the softest. In the one case because the surface was cooled in advance, in the other because it was heated in advance. Files are hardened in the following mixture: 2 parts (by weight) of salt, 15 parts of rye grist, and 30 parts of burnt cow hoofs, all ground together and mixed with a sufficient quantity of water to make a pasty mass, with which the files are covered. When dry, they are placed in a fire. If, during the heating, the coating should drop off at certain places, the files are promptly withdrawn and the place exposed is covered with dry hoof powder. It is returned to the fire, where it is left until a temperature is reached which best suits the steel of which it is made. Then the file is plunged vertically into the bath, care being taken not to move them to the right or left, as that would cause warping. The bath is made in the following manner: 28 parts of salt are dissolved in about 5 parts of water, to which a handful of iron scale is added. The tangs are softened by being plunged into red-hot lead.

Shop Cleanliness.—The clear thinking founder of Methodism said that "cleanliness is next to godliness," and if the axiom is not the basis of Methodism it is the basis of method. If there is anything that collects dirt—attracts dirt—faster than a tramp, it is machinery, and it is the worst of the ill usage that limits the life of machinery. Some time ago the management of a certain railroad ordered a cessation of the cleaning of its locomotives, with a view to save the cotton waste, labor and time used. The experiment was not successful. There is no machine from a locomotive to a watch, but needs occasional cleaning. Dirt interferes with motion and destroys material. It is a constant annoyance to the workman in the shop as well as the woman in the house. But in the shop there is danger added to annoyance. The danger arises from the presence of heaps of refuse, iron and steel chips and shavings, oil and waste, either of them inflammable alone, and combined are the source of more than one "incendiary" fire. Under favorable conditions—heat and moisture—a heap of chips from the machine shop will generate hydrogen gas in sufficient quantities to take fire when mixed with atmospheric air. Of course, the oil and fragments make a perfect tinder box of such debris. The shop sweepings should be placed under cover away from valuable property, and the shop and its tools should be kept clean if for no other reason than that of comfort.—*Ex.*

Vermin Riddance.—Half an ounce of soap boiled in a pint of water, and put on with a brush while boiling hot, infallibly destroys the bugs and their eggs. Flies are driven out of a room by hanging up a bunch of the Plantain, or Fleawort plant, after it has been dipped in milk. Rats and mice speedily disappear by mixing equal quantities of strong cheese and powdered squills; they devour this mixture with great greediness, while it is innocuous to man. When it is remembered how many persons have lost their lives by swallowing, in mistake, mixtures of strychnine, ratsbane, corrosive sublimate, which are commonly employed for this purpose, it becomes a matter of humanity to publish these items. House ants ravenously devour the kernels of walnuts, and shellbarks or hickory nuts. Crack some of these, and place them on a plate near the infested places, and when the plate is full of the ants, throw the contents in the fire. Cockroaches, as well as ants, are driven away by strewing elderberry leaves on the shelves and other places frequented by these troublesome insects.

Court Plaster.—Soak isinglass in a little warm water for 24 hours; then evaporate nearly all the water by gentle heat; dissolve the residue in a little dilute alcohol, and strain the whole through a piece of open linen. The strained mass should be a stiff jelly when cold. Now stretch a piece of silk or sarsenet on a wooden frame, and fix it tight with tacks or pack thread. Melt the jelly, and apply it to the silk thinly and evenly with a badger-hair brush. A second coating must be applied when the first has dried. When both are dry, apply over the whole surface two or three coatings of balsam of Peru. Plaster thus made is very pliable, and never breaks.

To Restore Old Oil-Paintings.—Take the painting out of the frame, lay it on a table, face up, and keep a wet cloth on it for two or three days, changing or cleaning the cloth as often as it becomes soiled. When the painting is clean, wash it with a sponge or brush dipped in nut-oil. This is much better than varnishing.

To Harden Malleable Iron.—Mix equal parts of common potash, saltpeter and sulphate of zinc, and use as directed for prussiate of potash.

American Joinery in England.—The first shipment to England of machine-made doors, window sashes, window blinds and similar articles of joinery took place in 1877, and although confined to doors for the cheaper class of houses, the goods at once met with a demand that justified the expectations of the shippers. For the first time, in 1877, some 19,000 doors and 6,284 pairs of sashes and blinds were shipped from New York to England, the greater part of which went thence to Australia and New Zealand. The shipment of doors to England and Scotland in 1878 was about 45,000, as against 2,800 in 1877. Up to June of the present year these shipments show a slight increase, but the total for the year will be much larger, as a single steamer carried out to England 45,000 American doors.

A Good Blacking.—A superior article is made by the following formula, which has been long in use: Mix intimately one pound of molasses, one pound of best bone-black in *very* fine powder, and one-quarter pound of olive oil; then add one-quarter pound of sulphuric acid, previously diluted with one-quarter pound of water. The whole is allowed to stand for three hours or longer, and afterwards as much water is added as is necessary to give it the proper consistency.

It has been going the rounds of the mechanical journals that iron gets shorter if heated red-hot and cooled in water, while steel gets longer if similarly treated. I have reason to believe that this is erroneous, and that both iron and steel may be made to get either longer or shorter at will. If this is the case, it can be made of very great importance to machinists, and I hope to shortly lay before your readers some experiments made to solve the question.—*Joshua Rose, M. E.*

Etching on Glass.—Etching on glass is performed by laying on the glass a ground of beeswax, and drawing the design thereon with the needle, as in etching upon copper. Sulphuric acid is then poured on, and fluor spar sprinkled on it. After four or five hours it is taken off, and the work cleaned with oil of turpentine.

Remedy for Corns.—Mr. Gezow, a Russian apothecary, recommends the following as a "sure" remedy for corns, stating that it proves effective within a short time, and without causing any pain: Salicylic acid, 30 parts; extract of cannabis indica, 5 parts; collodion, 240 parts. To be applied by means of a camel's hair pencil.

To Remove Glass Stoppers.—To move a tight glass stopper, hold the neck of the bottle to a flame, or take two turns of a string and seesaw it. The heat engendered expands the neck of the bottle before the expansion reaches the stopper.

Good Health.

Spring Complaints.

We eat about one-third more in winter than in summer, because we not only have to repair the wear and waste of the system, but we eat to keep the body warm, a portion of the food is converted into fuel; we must keep a bodily warmth of 90° or 100° winter and summer, but it is easy to understand, that, as the thermometer is at 40 in winter and 80 in summer, less fuel is required to sustain the natural temperature in warm weather; if yet, in defiance of this, we pile on the fuel, a wreck and ruin is as inevitable as the blowing up of a steam engine, if double the necessary quantity of steam is constantly generated.

For a while after the opening of spring, we have the appetite of winter, and not using our knowledge, we indulge it as extensively; and thus generating more heat than is needed, we soon begin to think "we are feverish," in other words, we are too warm, but instead of making less fire, we begin to tear down the walls of our bodily-house, by taking off our winter clothing, and thus add another cause of disease and death. In a short time, however, nature comes to our aid, and to save us, takes away our appetite; but we, taking this as an evidence of declining health, decide upon one of two things; either to eat without an appetite—which is expressively denominated as *"forcing it down"*—or we decide upon taking a tonic, forgetting that nature can neither be forced nor coaxed with impunity. The effect of eating without an appetite, or forcing an appetite by the use of tonics, is the same, that is, the introduction of more food into the stomach than nature requires, than there is juice to digest it; for, although you may take a tonic which whets the appetite, it does no more; it does not increase the amount of gastric juice, for nature supplies it only in proportion to the needs of the system, and if she gave as much when 20° of heat were required as when 60° were necessary, she would commit a great blunder—this she never does, when unmolested. Then we have more food in the stomach than there is gastric juice for; more wheat than there are mills to grind it; more work than there are workmen to perform. But nature has not "a lazy bone in her," but goes to work to do the best she can; the food is digested, but not thoroughly; it is ground up, but not perfectly; the work is done, but it is badly done; hence an imperfect material for making blood is furnished; and an impure blood, an imperfect blood, is inevitable. The best remedy for spring diseases of whatever name, is—*eat less.—Journal of Health.*

Leprosy in America.—The *Commonwealth* in a late issue remarks: "The medical journals see danger ahead from the leprosy which has been introduced into this country. Quite a number of unmistakable cases have been reported from the Southern States, and the disease is disagreably common among the Chinese in California. On the coast of New Brunswick there are several colonies of lepers. Physicians who have had good opportunities of investigating the character of the disease are of the opinion that it is contagious in the full sense of the term. It is nearly sure to spread to the same extent that leprous subjects freely associate with uncontaminated persons. Some salubrious little island in the Gulf of Mexico ought to be set apart for these unfortunate people, to which every new case of leprosy should be promptly transported. Immediate and complete isolation has always, from the most ancient periods, been held to be the only safe way of treating the loathsome complaint."

Care of Children.—Every mother should know that very young children often suffer for the want of fresh, cold water. This they should have every two hours, and more frequently, if they become restless and fretful. Fretfulness is generally caused by great thirst. While making a voyage at sea some years ago, I was greatly disturbed by the incessant crying, or moaning of a child, during the first few days of the journey. The child was about one year old and very delicate. I suggested to the mother that it wanted water. She said that it never, to her knowledge, tasted water, as she thought it dangerous to give to children so young. I assured her she need have no fear. I directed that it should have water every hour, a little at a time, until it became accustomed to it. This was given it, and during the rest of the voyage, of five or six days, I never saw a better or happier child. I believe the child's health was permanently impaired by the constant thirst that during its short life had been consuming it.

Calomel in Tomatoes.—An old subscriber and friend writes us that a celebrated French chemist and physician, who has analyzed tomatoes declares that they contain all the elements of calomel, and he has known them to salivate persons. She wishes our opinion on this subject, and we have only to say that this idea has been going the rounds of the press for more than 30 years. It is a falsehood from beginning to end. The idea that they produce salivation may possibly have originated from the fact that, eaten in large quantities by some persons, the acid of the fruit seems to irritate those parts of the mouth with which it comes in contact. The idea that tomatoes cause cancer, is another superstition, the outgrowth of the former notion that tomatoes were unfit to eat. They cause neither cancer nor salivation, and may be eaten with impunity by most persons, and often with great benefit.—*Herald of Health.*

Weak and Flabby Muscles.—Another lady subscriber asks us what can be done to restore muscles that become weak and flabby. To which we reply: If this condition is simply a result of disuse of the muscles, or want of exercise, then the remedy is careful and systematic physical exercise of the weak and flabby parts. Persons who lead an inactive or sedentary life are very apt to have weak and flabby muscles. The kind of exercise required to restore them depends somewhat upon the physical condition of the person. The various kinds of labor to be done about the house are good in their place, but we are very apt to do our work with the strongest muscles, and save the weaker from anything that strains them, consequently they have to be treated by special exercise, by rubbing, gymnastics, electricity, etc. All tight clothing or pressure upon weak muscles only makes the matter worse.—*Herald of Health.*

Personal Habits and Health.—The importance of personal habits as affecting health can hardly be over-estimated. Hundreds of cases can be cited of noted persons of the most feeble constitution who by care were able to prolong their lives and accomplish wonderful labors in spite of almost continuous illness. The Jews are said to be the longest-lived people, because of their strict attention to hygiene as directed in the Mosaic law. If a man by taking thought cannot add a cubit to his stature, he may at least lengthen his days very materially by prudence. Any one can prolong his or her life beyond the average term of years by simple attention to hygienic laws.

New Preventive Against Scurvy.—In reporting the reception of Prof. Nordenskjold and the staff of the *Vega* at Nagasaki, the correspondent of the *North China Herald* notes that there was not a single case of scurvy during the whole voyage. This, he learns, was owing to the free use of a curious little herry that springs out of the eternal ice and snow during the short summer; it bears profusely and has a taste like the raspberry, but more acid. The fruit is dried and then mixed with the milk of the reindeer, and it can be carried in a frozen state for thousands of miles. There was also used a curious kind of food made from the whale's hide, which is pickled and eaten freely during the winter.

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The Week.

The principal local feature of the past week has been the final passage and signature of the law preventing the employment of Chinese by corporations in California. The woolen mills, the jute factory and several mining companies have already discharged their Chinese employees in compliance with the law. The worst feature of the matter is that these companies have also discharged their white workmen, with a view of shutting down work entirely, stating that they cannot compete with similar branches of manufacture elsewhere at present prices of white labor. Meantime there are many idle men in the city in search of employment. The doubt as to the construction of many provisions of the new Constitution of the State, and the uncertainty with relation to pending measures before the Legislature is having an injurious effect upon business, which is comparatively dull in all branches.

The cold weather ie, for the time at least, over, and a good, heavy, but rather cold rain has visited us. This rain was much needed, and it ie to be hoped we will yet have more of it.

Among mining men the question of the hour ie the probable transfer of the mining stock business from San Francisco to New York. Capital centered there has already been largely invested in mining operations, and many of those persons intimately connected with the business here have gone across the continent to the more lively field. The stock market here is duller and duller as week succeeds week, and the Legislature is assisting rapidly in killing the business by the bills restricting dealings in mining stocks.

. In New York Government bonds are quoted at 106¾ for 4s of 1907; 103½ for 5s of 1881; 109½ for 4½s; sterling, $4.84@$4.86½; silver bare, 113½; silver coin, ¼ discount buying, par selling.

The Gravel Mines of Forest Hill, Placer County.

These mines were all opened at about the same time in 1853 and 1854. They are located on the divide between the North and Middle forks of the American river and very nearly in the geographical center of the county. The claims are located on one of the ancient river channels, or blue-gravel leads as they are sometimes called. The channel has a course running generally from northeast to southwest. The deepest line of depression in the bedrock is on the southeast side of the divide and nearly parallel to it. The rim rock disappearing, this depression comes to the surface near the lower end of the Dardanelles, turns there at about a right angle and strikes into the hill. The surface of the bedrock is undulating across, but seems to be in falls and benches with the divide. The deposit of gravel, cement, volcanic wash, etc., is about 450 feet thick where deepest and from 2,000 to 5,000 feet wide. The claims were all opened by drifting, and most of them have proved immensely rich, $800,000 being taken out from about a half acre of ground. Over $2,000,000 was taken out of the Dardanelles before hydraulicing was commenced. This mine took a premium at the State fair of 1860 as the best drifting claim in the State. Only the bedrock gravel was taken out by drifting, and it was not until about 1868 that hydraulicing was commenced in some of the claims. Since then their prospects have been continually improving, until to-day they are considered among the best of Placer county.

The Forest Hill mines proper are those comprised between the Rough & Ready on the east and the Big Spring on the west. Beyond the Rough & Ready are the noted mines of Bath and Michigan Bluffs on the same gravel deposit. Lower down below the Big Spring and in Todd's valley, ie located Pond & Co.'s claim, which has been hydrauliced since 1854. Of the nine claims within these limits only three are as yet hydrauliced—the Pemberton, Dardanelles and Big Spring. Of the others but little can be said.

The Rough & Ready has yielded much gold, but is at present idle. The Jersey claim adjoins the Rough & Ready on the west. The southeast portion has all been drifted out. It yielded $1,500,000. Prospecting is at present going on in that portion of the claim which was not reached by the old tunnels.

The Mountain and Baltimore claims come next. The Mountain worked through its own tunnel produced a large amount of gold. New ground is being prospected through the Baltimore tunnel. This tunnel runs 2,600 feet into the hill. In the Baltimore at present only prospecting work is going on. It is owned by Alvinza Hayward.

The Hope claim with a frontage of 500 feet on the Middle fork is perhaps the most important of the smaller mines. It has a tunnel running in 1,800 feet. The gravel is struck 125 feet from the entrance, and continues for 350 feet when it pitches up. At a distance of 450 feet from the mouth a drift runs off to the east 300 feet in the channel. Rich gravel has been taken out and prospecting going on now is showing favorably. But a small portion of the gravel available for drifting has been taken out. As the whole claim from the surface down prospects well, it will be worked by hydraulicing. The owner is S. G. Phillips, of Auburn.

A small claim, known as the Unkle Sam, comes between the Hope and Pemberton mines. Some gravel has been sluiced off the face and most of the channel has been worked out through bedrock tunnels. It is not worked at present.

The hydraulic mines before mentioned are of far greater importance, and the more they are opened the richer they prove.

The Pemberton Mine.

This mine is owned by an incorporated company, and consists of the old Green Spring claim. Most of the stock is owned in Boston, though some local capitalists are interested. The mine has 600 feet front on the Middle fork, and covers 60 acres of the Divide, all of which can be hydrauliced. About 25,000 cubic yards of gravel have been washed off, principally before the mine became the property of the Pemberton company. Although only top gravel, and washed by very imperfect appliances, it paid largely. The mine was opened for prospecting and drifting by a bedrock tunnel run in 1852. At 350 feet from the entrance it strikes the front channel, which on the tunnel level is 150 feet wide. The gravel in the channel below the level of the tunnel is as yet untouched.

Water is obtained from Pond's lower ditch, 600 inches being all that is used at present. It is carried through 22-inch pipe, 2,000 feet from the sand box to the giant. This line of pipe crosses two depressions of 350 and 100 feet respectively. The company have one No. 4 giant with a five-inch nozzle. Instead of an outlet tunnel, an open cut 40 feet deep has been made through the rim rock. The company have 1,200 feet of sluice boxes three feet wide and two feet deep, well lined and blocked. In the line of the boxes are eleven drops and six undercurrents. These latter are constructed in the most thorough manner. The tailings are run into the Oro canyon and pass through the tail sluices of the Dardanelles company before being dumped into the river.

The mine has just been fitted up preparatory to commencing active operations. The gravel is similar in every respect to that of the adjoining Oro claim belonging to the Dardanelles company. So promising are all the indications, that as soon as the mine is more fully opened and the washing facilities correspondingly increased, it will without doubt be one of the most profitable on the Divide.

Dardanelles Consolidated Gravel Mine.

This large and valuable property is owned by an incorporated company. The mining ground consists of the old Dardanelles and Oro claims, having a frontage of about 2,000 feet on the Middle fork, and running back to Devil's canyon, comprising some 312 acres of patented mineral land. The company also own the Zeta and Pei claims, containing 320 acres and adjoining the famous Paragon mine of Bath.

The water used is brought from Shirt-tail canyon, a tributary of the North fork, by the Miners' ditch, 17 miles long and carrying 4,000 inches. This ditch, and the Freeman ditch, capacity 500 inches, are owned by the Dardanelles company. In addition to supplying all the water used by their own mines, the Miners' ditch furnishes water to the mines of the Brushy and Yankee Jim's districts.

Three No. 6 giants are used, with nozzle orifices of 7, 7½ and 8 inches respectively. The water comes from the sand box under about 300 feet head to each giant by a string of 22-inch pipe, and the water used running under full head is from 1,200 to 1,700 inches to each pipe.

Three outlet tunnels carry the washed gravel through the rim rock and into the Dardanelles canyon. The sluice boxes are 4 and 4½ feet wide. In the canyon are 10 undercurrents from 12 to 24 feet wide, and another 24 feet wide will soon be added. The canyon is 1⅞ miles long, and has 1,800 feet fall to the river. The gravel, though very strongly cemented in the mine, is thoroughly disintegrated before it reaches the river and nearly all of the gold caught. Into this canyon also run the tailings of the Big Spring and Pemberton hydraulic mines and the drifting claims.

The bank of gravel has been washed through nearly the entire width of the mine. In the Dardanelles or western part of the mine, the washing has gone on till the face of the present bank is nearly 300 feet high. In the Oro consideraably less gravel has been moved. In all over 7,000,000 cubic yards have been sluiced off, and the mine is now in such condition that 2,500,000 cubic yards will be washed this winter. The gravel being strongly cemented, bank blasting is indispensable to break it up before washing. Some very large blasts have been exploded in this mine, one of 36,000 pounds of powder. Judson powder manufactured by the Giant Powder Company is the only explosive used, experience having shown its superiority to any other kind for bank blasting. For drifting the company have a bedrock tunnel near the western boundary of the mine where the gravel is overlaid by a bed of cement. Drifting in this tunnel was resumed about six months ago for the first time since 1868. Extremely rich gravel is now being taken out. Part of the gravel pays well for drifting 30 feet above the bedrock. From 30 to 50 men are constantly employed.

The Big Spring Mine.

This claim has a frontage of 1,000 feet, and extends back 5,000 feet. The bedrock is much higher than in the adjoining Dardanelles, and slopes, at least in the eastern part of the mine, towards it. The water used, 500 inches, comes from Pond's upper ditch. A string of 11-inch pipe takes the water under 275 feet pressure to a No. 3 giant with a 5-inch nozzle. The mine has 350 feet of sluice boxes and one undercurrent. The tailings are discharged into the Dardanelles canyon.

Piping was commenced about two years ago, on the eastern third of the claim working from the rim rock inward. As yet no large body of gravel has been struck, the mass of the hill here being cement or other barren ground. The bedrock streak of gravel is, however, very rich, and is getting thicker as they wash further inward. It is claimed that the western part of the mine is richer than the portion now being washed. The deposits prospected through two tunnels, one in their own ground, the other branching off from the Dardanelles tunnel and running much further in. By drifting from the latter large amounts of gold were taken out in early days, and the present owners intend to resume work in it shortly. The owners are Messrs. Pecht, May and Neumann of Forest Hill, all being practical miners.

Sacramento Foundry Work.—Root, Neilson & Co., of the Union Iron Works of Sacramento, are at present engaged in constructing a five-stamp mill for the Bullion mining company of Paradise valley, Nev., and also completing a five-stamp mill, with pans, settlers, etc., for the Gold Mountain mine, Amador county, Cal. They recently shipped a large and complete mill to a mine in Arizona. The works are engaged in a good variety of job work, and being the oldest established foundry in Sacramento, have a steadily increasing trade. Their position, near the Northern mines, is of advantage to them. We are pleased to note the successful progress of this foundry.

Roumanian independence will be recognized by England, France and Germany in a few days.

The Skagit Mines.

The latest thing in the way of an "excitement" is that concerning the Skagit mines, and there is a strong probability of a rush there when the spring opens. At present the cold weather has practically closed the mines down. There seems to be considerable difference of opinion as to the best route to the mines, and several trails are being opened. The new road from Whatcom to Skagit gold fields is being rapidly pushed forward, and will probably be open for travel about the middle of April, as the snow will hardly disappear before that time. This is called the Chillawhack route, and is said to be shorter than the Hope trail by ten miles. Passengers can reach Whatcom from Port Townsend by water, in four hours, and the gold fields can be reached entirely by land, excepting the passage across Summit lake, seven miles wide, which will be navigable at all times. Timely notice of the opening of this road will be given, so that miners from California may not be induced to start earlier than necessary. The snow in the diggings in the early of this month was about five feet.

The distances to the mines by the Seattle route are as follows: From Seattle to the mouth of Skagit river (by boat), 55 miles; from the river mouth to Mt. Vernon, 11 miles; from there to the head of steamboat navigation, 64 miles; from there to Godell's place, by canoe, 7 miles; from the portage into Ruby creek, by trail, 30 miles. Total distance from Seattle to Ruby creek, by water and Skagit trail, 167 miles.

A gentleman in Virginia City received a letter from a friend at the Skagit mines, extracts from which are published in the *Enterprise*. The writer says that the diggings were discovered by a party of five prospectors in July, 1878. They are on what is called Ruby creek, a stream about six miles in length, and on which claims have been taken up for a distance of two or three miles. Claims are now 250 feet front, but there is talk of cutting them down. On the east side of the Skagit there is a region of country some 20 miles in length which has as yet been but little prospected, though some of the streams have been found to be rich in gold.

At the time the letter was written, February 3d, there was but 75 men in the diggings. Bedrock had nowhere been reached in the creeks. Water is everywhere abundant—"too much so," says the writer. The summers are warm and the winters not cold, though this winter has been an exception, as they had five feet of snow.

The trip from Seattle to Godell's, at the head of canoe navigation, including passage per steamer and canoe, costs but $12 each men—fare per steamer $5, and special arrangement made with Indians for about $7 per man. The distance can be made in about eighteen hours, stopping at every camp on the route for the purpose of receiving and depositing freight and passengers.

From what the writer says there appears to be a vast region of country to the northward of where mining is now being done about which nothing is known. It is a new and unexplored region.

Canyon creek is another place in the same vicinity, which is being worked by a few miners. It seems difficult to obtain any authentic information or particulars of yield of dirt, character of diggings, etc. We have nowhere seen mention of the amount per day to be obtained by pan or rocker on the average. No doubt as spring approaches additional particulars on these points will be forthcoming. In view of the general prevalent dullness many men will go, and the country about the Skagit diggings will be pretty thoroughly prospected during the coming summer.

Reduction in R. R. Fares Between S. F. and the East.—The question of reduction of fares between the East and this city is being mooted by the leading railroad companies there, and the C. P. R. R. and U. P. R. R. Nothing definite has been determined as yet. The C. P. R. R. has on its own responsibility taken the initiative in this direction by reducing the fare in third-class cars from San Francisco to New York to $35, on two days named in their advertisement. As a still further inducement, sleeping berths will be provided to Ogden free. It is to be hoped that this experiment will be so successful that the reduction will be continued, and also extended proportionately to all other grades of passenger fare. We understand that the Union Pacific have notified the Western railroad managers' meeting at Chicago that their proposition respecting pro rata per mile ticket from San Francisco to New York, with a rebate at New York, was not accepted, and that arrangements had been made with the Pennsylvania road to carry Western passengers via St. Louis. Chicago roads will attempt to interfere with this plan.

The San Francisco Copper Mine and Reduction Works, located at Spenceville, Nevada county, discharged 26 Chinese workmen employed by them. The company intends sending to Spain for white laborers to supply the places of the discharged Chinese, representing that the work is of too unhealthy a character for persons unaccustomed to it to undertake it.

Appliances for Silk Reeling.

Now that silk "family style" is the plan upon which believers in sericulture are urging the industry upon the attention of the public, it will be interesting to show some of the appliances used in reeling silk by the hand method. It must be premised that in France the hand reels have been well nigh superseded by the "filatures" or establishments in which reeling by steam power is carried on. And it has been claimed on good ground no doubt that the rate of wages in this country wholly precludes hand reeling, except it be in the handling of silk in the family and by the labor of the inmates of the home, something as the old time spinning of flax and woolen yarn was done. Whether the industry will ever come to anything on this basis is a problem akin to the question as to whether we shall ever make our own tea by home drying of leaves of garden-grown plants. In order, however, to aid in the work of drawing public attention to the proposition, so that its possibilities may be weighed in the general judgment, we have chosen to illustrate the hand reeling of silk and describe the process and appliances employed.

We are enabled to do this with the assistance of a work lately issued by Gen. Le Duc, Commissioner of Agriculture, being the report by Prof. C. V. Riley of a special investigation he made concerning the adaptations of this country to silk culture. From this source we draw the information which we present, as follows:

If the mere rearing of the worm and the production of the cocoons is simple, the reeling of the silk is by no means so, as the greatest skill is required to accomplish the work properly, and the value of a hank of silk depends as much on the skill of the reeler as upon the quality of the original thread.

The thread of silk as it unwinds from the cocoon is valueless for manufacturing purposes, several of them combined going to make the staple of commerce. The persons employed in unwinding silk are mostly women, one standing or sitting before each basin, of which she has entire charge. The basin is made of copper, and, in the large establishments, the water in each basin is heated by steam, at the control of the operator. The cocoons are plunged into the water, when it is near the boiling point, and moved about so that the gum which fastens the threads becomes uniformly and thoroughly softened. They are then beaten with a small birchen broom, having the tips split, so that the loose threads readily fasten to them. After heating a short time, the operator gets the cocoons fastened, and, taking the bundle of threads, shakes the cocoons till each hangs but by a single one. She now takes up five or more threads, according to the quality of the silk wanted, unites them, and introduces the combined staple or strand into a little glass eye on one side of the basin. She then forms a second similar strand and introduces it into a second eye on the other side. The strands are then brought together, twisted several times, seperated above the twist, and introduced into two other glass eyes or ringlets through which they are led, one to each end of the reel or *tambour*, which is kept revolving in a steady, rapid manner, and to which is also given a certain heck and forth side motion. The great object in reeling is to get the threads uniform, rounded, well joined, properly freed from moisture, and so crossed on the reel that they will not stick or glaze, as it is termed. These objects are attained by the twisting and the to and fro lateral movement of the reel, as also by properly regulating the distance between reel and basin. The uniformity of the thread depends on the skill of the operator, who must supply a new thread as soon as one begins to give out.

In order to better illustrate these principles, we have introduced figures of three reels. Fig. 1 is the old Piedmontese reel, which for many years holds its supremacy, and which has been the foundation of numerous improved reels. It is formed of four bars or arms, and is usually about a yard in circumference. One of these bars is provided with hinges so that it may fold inwards towards the center when it becomes necessary to slacken the silk in order to carefully remove it from the reel. The lateral movements so necessary in order that the consecutive circles shall not stick together is gained in rather a clumsy manner by means of cogs. The strands, after being twisted several times at *c*, in order to round and smooth the thread by friction, are passed over the guides *b b*, which are inserted in the traversing bar *a*. To this bar the lateral movement is imparted by a pin connected with the outer circumference of the cog-wheel *d*. This is connected at *e* with the cog revolving with the shaft of the reel. *f* represents a charcoal furnace under the copper basin *g*. The cross-bar *h*, to which are attached the glass eyes through which the thread from the cocoons first pass, is usually widened into a shelf, upon which to place the broom and the cold water for the reeler's fingers.

Figs. 2 and 3 represent, respectively, a plane view, seen from above, and a longitudinal vertical section of an old French reel, differing somewhat from the Piedmontese, and the principles of which are employed in all the improved reeling establishments of to-day. The following is the explanation of the lettering: *a*. The oblong water-basin heated by a charcoal furnace or by steam, and frequently divided by partitions. *b b*. Hooked wires or eyelets to guide several threads and keep them apart. *c c*. Points where the threads are twisted upon each other to clean their surfaces and compactly round them. *d*. Cylinder on shaft, with a spiral groove in its surface, in which fits a pin from the traversing bar, thus giving the lateral move-

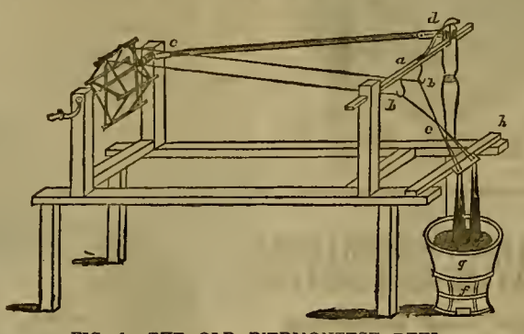

FIG. 1. THE OLD PIEDMONTESE REEL.

ment to the thread which goes through a guider on the front end of the bar, which moves through the arc of a circle. *e*. The reel. *f*. Pulleys which transmit by a belt the rotary motion of the cylinder *d* to the reel *e*, that connected with the reel being the smaller of the two. *g*. Friction lever, for tightening or slackening the endless cord, in setting or stopping the winding operation. There is usually a series of such reels in one apartment, driven by the same motive power, but each of them, as has been shown, can be stopped at pleasure. In case the reels are driven by a steam engine, stopcocks and pipes are so arranged that the water in every basin can be instantly or gradually heated by steam. If desired to run the cocoons, and the other stool is occupied by the child who turns the crank.

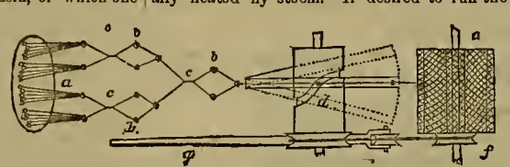

FIG. 2. OLD FRENCH REEL SEEN FROM ABOVE.

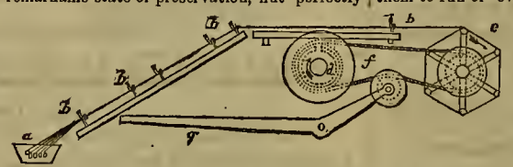

FIG. 3. LONGITUDINAL SECTION OF THE SAME.

reel by hand, a handle can be placed upon the shaft of the cylinder *d*, or of the reel *e*.

Fig. 4 represents a hand reel, of much the same style as the last, set up and ready for work. It is as good a hand reel as is now in use, though it is made on the same principle as the old French reel of forty years ago. The following is the description of its parts: *a*. Tin basin with copper bottom for holding the water in which the cocoons are boiled, fitting tightly over the tray *b*. *b*. Square tin tray for reception of cocoons, etc. *c*. Short stick inserted in a holder, on which the ends of the cocoons are wound, so as to be ready for use. *e*. Cock to let off water from the basin. This should be done every night after use. *f*. Door of furnace lined with fire-bricks, wherein the charcoal fire is lighted to heat the water in *a*. *g*. Flue pipe to carry off fumes. *h h*. Glass eyes on wire holders, through which the threads from the cocoons pass upward to the pulleys at *k*. *i*. A former arrangement for twisting the threads one upon the other; this is now discontinued as unnecessary, since the twist given to the threads at *k* and continued downward to the point *h* effects its purpose with a minimum of friction, and produces a superior thread. This twist is effected by the very simple method of passing one thread round the other, as shown in the small drawing of the pulley *k*. *k k*. Rollers or pulleys revolving on bent-wire stands, over which the threads pass. *l l*. Porcelain tubes on wire holders, between which the threads pass to reach *o*. Glass eyes may be substituted for the first pair of these tubes with equal advantage. *n n*. A grooved arrangement by means of which the long guider working to and fro distributes the thread to the reel "in the cross." Unless the thread is thus wound "on the cross," it cannot be unwound at the mills when required to be thrown, and is, therefore, unsalable. *o*. The top of the reel on which the silk is wound. One of the arms is furnished with the screw-hinge attached, by means of which the length of the arm is diminished to take off the silk.

The adult reeler sits on the stool in front of

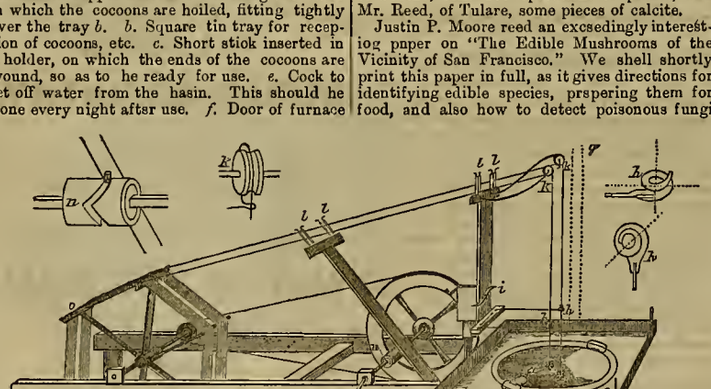

FIG. 4. IMPROVED LOMBARDY REEL READY FOR WORK.

Academy of Sciences.

A regular meeting of the Academy of Sciences was held on Monday evening, President Davidson in the chair. The donations were smaller than usual, but one was exceedingly rare, being a kangaroo squirrel taken from Salt Marsh, Sand Spring station, Churchill county, Nevada. The animal, which had apparently fallen into the marsh and been drowned, is in a remarkable state of preservation, but perfectly coated with saline matter. It was presented by C. B. Plummer. A specimen of amphiroa, found in front of the Ocean Side house, was contributed by Mr. Bissell. Amongst the numerous pamphlets was a complete catalogue of Pacific coast fungi, published under the direction of the Academy, by H. W. Harkness, M. D., and Justin P. Moore. Dr. G. E. Eisen, of Fresno, sent 100 specimens of plants, and Mr. Reed, of Tulare, some pieces of calcite.

Justin P. Moore read an exceedingly interesting paper on "The Edible Mushrooms of the Vicinity of San Francisco." We shall shortly print this paper in full, as it gives directions for identifying edible species, preparing them for food, and also how to detect poisonous fungi and how to overcome the effects of the poison.

W. N. Lockington read a scholarly essay entitled, "Is Evolution Immoral?"

Dr. A. Kellogg described three new species of plants collected by Dr. Gustav Eisen.

The Council of the Academy has appointed the following Curators: Birds and Mammals, Henry Chapman; Fishes, Crustacea, Rediates and Reptiles, W. N. Lockington; Botany, A. Kellogg; Paleontology and Geology, C. C. Cadman; Mineralogy, C. D. Gibbes; Ethnology and Osteology, A. B. Stout.

The treaty with the Hawaiian government has been presented to the German Federal Council.

Legislative Matters.

The members of the State Legislature, now in session at Sacramento, are doing work enough in one direction at least, viz., introducing bills. Measures are proposed which will affect one way or another the various branches of nearly every industry in the State. The most important act so far, which has become a law, is that prohibiting the employment of Chinese by corporations. Already many large corporations have discharged their Chinese help, and others are preparing to do so. There is considerable difference of opinion as to the advisability of the step, many manufacturers arguing that they cannot compete with Eastern people unless Chinese are employed, and the question of the constitutionality of the law will no doubt be tested before long.

Senator George has introduced a bill amending the Civil Code, providing for the redemption of stock sold for delinquent assessments. The bill allows 60 days for the redemption of stock sold for assessments. Under the present laws, property sold under execution for debt or taxes is subject to redemption within a certain time, but the sales of stocks for assessments are peremptory, and there is no chance for redemption.

The following is the bill relating to debris, introduced Saturday by Senator Davis:

Every person, as well as every person who, in behalf of any other person, or as the manager, agent, employe of any person or corporation, who runs or deposits, or who procures or suffers to be run or deposited into the bed or channel of any river in this State, or any branch thereof, any of the tailings or debris from any mine in this State worked by what is called the hydraulic process, is hereby declared guilty of a misdemeanor; provided nothing in this act shall be construed to prohibit the owners of such mine from acquiring various gulches and flats adjacent to such rivers or their branches, and therein depositing such tailings and debris; provided, further, that by means of dams or other obstructions they confine such tailings and debris thereto, and do not allow or suffer them to run or eventually flow into any of the aforesaid river channels or their branches.

In addition to the remedy given by the preceding section, violation of this act may be prevented by injunction at the instance of the State or any county therein, or at the instance of any taxpayers of this State.

The following bill has been introduced by Rowell, of Fresno, to protect water rights:

Section 1. Whenever by priority of appropriation, under and in compliance with the laws of this State, rights to the use of water for mining, agricultural or manufacturing purposes have vested and accrued, the owners of such vested rights shall be maintained and protected in the same.

Sec. 2. The unappropriated waters of all now navigable streams shall be subject to diversion and appropriation for use for mining, agricultural and manufacturing purposes, and such appropriation of water is hereby declared to be a public use thereof.

There was another bill by Rowell on the same subject, repealing section 1,422 of the Civil Code, which protects the rights of riparian owners.

The following is contained in the memorial submitted to the Legislature by the Regents of the University as the wants of that institution:

First—Five thousand dollars for the Agricultural Department, including the Botanical Garden, Agricultural Implements, Agricultural Experiments and Lectures on Practical Agriculture.

Second—Five thousand dollars for the Mechanical Arts Department, including Implements, Mechanical and Illustrative Manipulations, and special instructions therein.

Third—Five thousand dollars for the College of Mining, to complete the equipment of the Metallurgical and Assaying Laboratory, so as to meet the immediate necessities of the said department.

Fourth—Ten thousand dollars for the Department of Mineralogy, for cases, laboratory outfit and equipment, and instruments of precision required for instruction.

Fifth—Six thousand dollars for the compilation of a catalogue of the minerals, rocks, ores, etc., of the State, based on the collection now extant in the University Museum and elsewhere, and obtaining additional data for said purpose (not including the printing of the catalogue), to be done under the supervision of the University.

The workingmen have had several processions during the week, and have called upon many leading corporations and firms, asking them to discharge their Chinamen in accordance with the provisions of the New Constitution.

J. C. Woods, one of California's pioneers, at one time the manager of the banking department of Adams & Co.'s express, died at Mare Island on the 16th inst. very suddenly. He leaves a wife and three children.

SAN RAFAEL MINES.—Mineral prospecting is not a new thing in this county, though, of conrse, it has now expanded into proportions never dreamed of before. In 1858, a party of gentlemen, among whom were U. M. Gordon, J. and J. O. B. Short, T. Parker, O. and B. Smith, W. Pearson, Jas. Harris, Jas. Flood and W. S. O'Brien, opened a ledge on the ridge back of Mr. Lichtenberg's present residence and did considerable work. The rock prospected from $8 to $30 per ton, and it paid, when worked in an arastra, as high as $8; but wages being $4 and $5 per day it was not remunerative and was abandoned. The old arastra stands there to this day. Perhaps under the inspiration of the new deal it will awake from its sleep of two decades and the mine become profitable. James Watson has always held that there was pay rock in many parts of the county, and has prospected more or less every year. We have a nugget of gold that he took from one of his prospects about two years ago. Capt. McKenzie tells of an old miner who packed some rock down from Tamalpais many years ago which assayed handsomely, but the old fellow struck some other lead and never came back. We have heard also, that Mr. J. B. Redmond had an assay made of rock taken from his ranch at Novato, some 20 years ago, which was as rich as the new developments are claimed to be. W. L. Barnard has always had faith that we had mineral wealth, and has chipped a spur from time to time, and so have many others. The gentlemen who are opening the mines on White hill have, therefore, many disciples who start even with them in ready-made faith.—*San Rafael Journal.*

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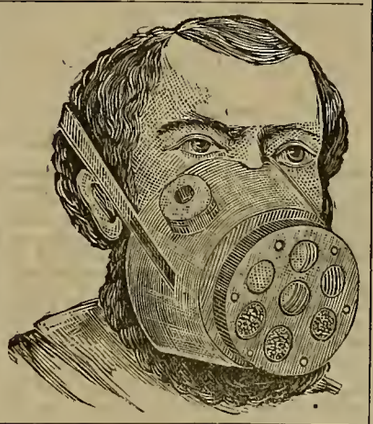

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Also, to our large and well adapted stock of

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Ore Pulverizers.

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The furnace is especially adapted for roasting refractory ores; there are more than fifty in use in Colorado, giving perfect satisfaction.
The Ore Pulverizer is built in different sizes. It is preferable to Stamp Mills because it requires less power and less repairs than Stamps. No extra expense for setting up, and no foundation. Less weight and less cost than stamps.
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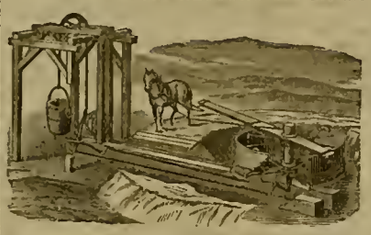
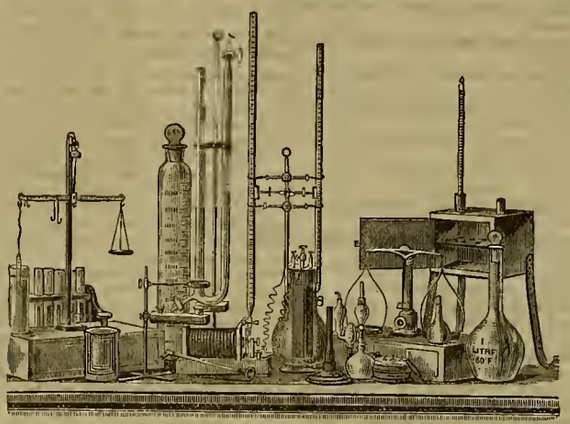


MINERS' HORSE-POWER.

This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.
The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing

REYNOLDS & RIX, 49 Fremont Street, San Francisco.



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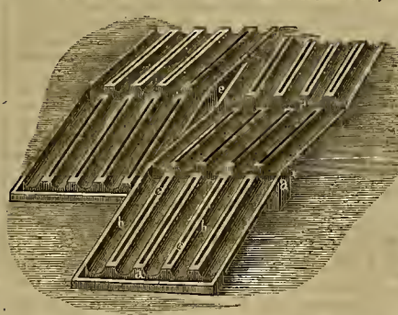
Suitable for Analytical, Technical and Experimental Use. ☞Descriptive Priced Catalogues furnished on application.

Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

STEIGER & KERR, of the Occidental Foundry, 137 First St., S. F.,

Who have the sole right of manufacturing this Riffle, and who will receive and attend to all orders.

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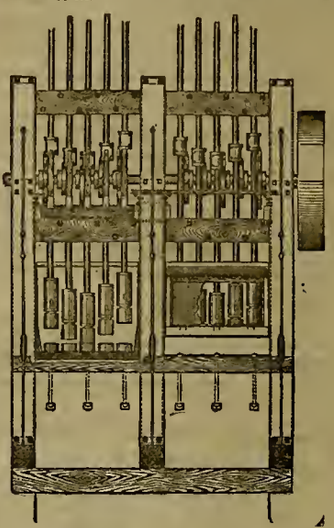
Grinding and Amalgamating MACHINERY.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



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FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.
We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

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We construct Mills with Stamps weighing from 250 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

The Large Circulation of the MINING AND SCIENTIFIC PRESS extends throughout the mining districts of California, Nevada, Utah, Colorado, Arizona, Idaho, Montana, British Columbia, and to other parts of North and South America. Established in 1860, it has long been the leading Mining Journal of the continent, its varied and reliable contents giving it a character popular with both its reading and advertising patrons.

[CONTINUED FROM PAGE 117.]

with Belcher. The incline hslow the 2700 level is being continued down.

WARD.—Shaft down 2035 ft and making good progress.

NEW YORK.—The crosscut east on the 1600 level has entered the casing of the ledge and is developing some good indications as the ore vein is being neared.

MEXICAN.—The main lateral drift north, 2300 level, is being pushed on rapidly toward the workings south from the bottom of the joint Union winze from the 2,000 level, and connection will be made by the latter part of this week. The joint Union crosscut east, 2300 level, is in 30 ft, and passing through a favorable vein formation.

CON. VIRGINIA.—The joint California east crosscut on the 2350 level continues in a fine vein formation showing some quartz, its face 67 ft east of the lateral drift north. The joint Best & Belcher crosscut east on the 2150 level is in 85 ft. The yield of the stopes on the 1750 and 1550 levels continues.

YELLOW JACKET.—Since the connection between the north drift on the 2700 level and that south on the 2800 of the Con. Imperial, work has been pushed south on the 2700 level.

GOULD & CURRY.—The raise from the 1700 level to meet the G. & C. and B. & B. shaft is making exceedingly good progress and is now up 87 ft.

BULLION.—Still repairing the main shaft and incline. While this work is going on and preparatory to opening up the 2500 level, a diamond drill is running west into the ledge in the direction whence hot water was encountered above, to guard against an influx of it when the level is opened up.

QUINN.—So much water has been encountered on the 100 level that it could not be profitably bailed out. The men have, therefore, been knocked off.

UTAH.—The incline is down 220 ft on the slope below the 1750 level and in good working ground, having but a light flow of water. East crosscut, 1750 level, is in 135 ft in good vein material. South lateral drift is cutting vein matter.

BELMONT DISTRICT.

BELMONT.—Cor. *Courier*, Feb. 7: Our crosscut west from 300 level was advanced through very hard slate, in which we find stringers of quartz showing strong traces of mineral. The main 300 drift running north was extended 12 ft in the vein, which is showing 8 inches of $40-ore. We will commence to extend No. 2 raise up to the next level.

SAN ANTONIO.—Are pushing the 450 crosscut as fast as possible. The rock is a very hard porphyritic slate. The rock appears to be changing for the better. By sounding through from the 350-ft drift we find we are on the correct course for the ledge.

BRISTOL DISTRICT.

HILLSIDE.—Pioche *Record*, Feb. 7: The Hillside smelter will shut down next week. As it is a heavy expense in lining it up and keeping it in repair the company intend tearing it down and putting in position their new water-jacket, which will be placed in running order as soon as possible. They have already ordered from San Francisco another water-jacket furnace of 50 tons capacity, sections of which ought to arrive in 20 days. As the cupel furnaces of the Hillside company have proven to be a perfect success, additional facilities will soon be added, enabling the company to refine all their bullion, thus doing away with the tedious process of shipping by teams to the railroad.

BRISTOL.—The machinery of the Bristol mining company is awaiting transportation at the terminus of the Utah Southern. It is said to be the intention of this company to erect their mill adjoining the Hillside reductiou works.

EUREKA DISTRICT.

EUREKA CON.—*Sentinel* Feb. 12: First level—Winze in all 20 ft. Third level—West drift in all 86 ft. Seventh level—Northeast drift in all 110 ft; north drift in all 91 ft; upraise in all 17 ft; southwest drift in all 155 ft. Eight level—East drift in all 111 ft. Niuth level—Drift from raise in all 15 ft. Tenth level—East drift in all 132 ft; drift south of quartzite in all 19 ft. Eleventh level—East drift in all 102 ft.

STRIKE IN EUREKA TUNNEL.—A new strike of an ore body has been made, the extent of which is not yet known. It commenced in the bottom of the tunnel, about an inch and a half thick, and disappears in the rock, at which point it is 31 inches thick. No assays have yet been made, but the ore is apparently of good quality. The tunnel is now passing through the El Dorado No. 2, patented ground, the property of M. H. Joseph, Fifield and Malloy.

EL DORADO No. 2.—Is situated on the east side of Prospect mountain, about 1,000 ft from the mouth of the Eureka tunuel, which it crosses, and runs north of about 200 ft. It gives evidence of being a good mine, showing heavy croppings, commencing at its south end line and running northwest about 1,100 ft, when they sink under a shale formation. During three months, under a course of prospecting, 32 tons of ore yielded an average of over $100 per ton in gold and silver; very trsctable and of excellent quality for smelting. Not a pound of ore has yet been taken from the stopes. The vein runs from six inches to five ft in thickness, showing continuously from where it was first struck to the lowest depth attained. The surface ground is covered by a United States patent.

MAMMOTH DISTRICT.

MINING ITEMS.—The Silver Wave, lately incorporated by Mr. Stocker and others, shows rich ore assaying from $100 to $150 per ton. Welch & Evans have a good thing in their mine and 250 tons of ore on the dump, which runs from $100 to $250 per ton. Welch, Labeau & Millers are extracting ore worth from $200 to $300 per ton. The Esta Buena (now idle for want of machinery) produced over $27,000 in the last two months' run. Holmans' mine, near Marble Falls, is prospecting well, as is also McPherson's, near the same place, ore from which, lately milled, gave $140 per ton.

TOIGABE DISTRICT.

GRANTSVILLE ITEMS.—A big strike has been made in the Lefler company's mine, situated immediately north of the Great American Rooster. The ledge just discovered is said to be very extensive, and assays all the way from $40 to $800 per ton. The main shaft in this mine is down 40 ft, and a tunnel has been run in a distance of 170 ft. The discovery of this body of ore has created quite an excitement in Grantsville, and the prospects of this camp becoming one of the best in Nevada are improving daily. Peter Lefler is one of the original locators of this mine.

WHITE PINE DISTRICT.

CHERRY CREEK ITEMS.—Eureka *Sentinal:* The Star mine is looking better and showing more pay ore than it has for the past six months. The 540 or lower level has, within the past two weeks, opened out nicely, showing from four to five ft of first-class ore, and its prospects for a long and profitable run are remarkably flattering. The Star mine has produced over $1,000,000. This for a young mine, with only a depth of 540 ft, and being situated in much-abused White Pine county, is a very fair showing. W. J. Haynes, Superintendent of the El Capitan mine, at Shellburn, has recently developed a flue body of ore in that mine, proving it to be a valuable property. Mr. E. S. Smith, of New York city, who has a bond on the Ruby Hill mines, belonging to F. A. McDermitt and others, has put a force of men to work. This property is well known by all old White Piners, and is believed to be as meritorious a mining property as there is in eastoru Nevada. Mr. J. B. Williamson has bonded the Teacup and Geneva mines to Eastern parties. The Teacup has produced $700,000, and has a shaft of 700 ft, showing a true contact vein of high-grade milling ore. The Geneva also has produced considerable bullion, which shows quite a large percentage of gold. Dr. Brooks, of Ward, has bonded some mines in Silver canyon and put a force of men to work. The Muncey Creek mines, belonging to Hallowell, Plageman and others, are bonded to Eastern parties. The Martin White company, at Ward, are getting along nicely with their tunnel, making as much as 20 ft every 30 hours.

WINNEMUCCA DISTRICT.

BARTLETT CREEK ITEMS.—*Silver State*, Feb. 9: G. J. Barry arrived here yesterday from Bartlett creek, where he has been engaged in mining for over a year past. He has prospected the Mogul mine to a depth of 200 ft. The ledge is from three to four ft wide, and he says the ore will average $100 in silver and $50 in gold to the ton. A. Hall is at work on the Gaddy running a tunnel, and there is eight inches of ore in the ledge that will work $500 in gold to the ton. Beach & Co. are at work on the Sage Hen ledge, on Snow creek, and have four ft of ore that will work $15 per ton in gold. J. W. Trevathan is developing the War Eagle. The ledge shows four ft of ore, and about 100 tons of ore is on the dump at this mine that will work $25 to the ton in gold.

ARIZONA.

GLOBE ITEMS.—*Silver Belt*, Feb. 7: J. W. Haskin has purchased from R. W. Chilson the South Silver Nuggrt, Richmond basin. It is reported as looking well. Mike Whalen has the contract for running 100 ft on the Haskin tunnel, tho consideration being $700. The shaft and tunnel of the Irene are so near a juncture that the blows of the hammers can be distinctly heard from either. The break may be expected any moment. Mr. Watson is having another tunnel run on the Silver Era ledge, which is now in about 120 ft—ore wholo distance, which fills the face of the tunnel. The width of pay ore cannot he ascertained until the ledge is crosscut. It is currently reported that the crosscut on the Mexican ledge has revealed, at the depth of 103 ft, a vein 36 ft wide. Another statement is that the vein is 68 ft and shows 40 ft milling ore. There is no doubt but what a large body of ore has been discovered, and that further depths will reveal a still larger body. The strike is a flattering one for the camp, and will put money in the pockets of the owners of the mine.

News in Brief.

SENATOR LAMAR is in Washington.

A DAMAGING flood prevails in Kentucky.

THE Grant party have left Havana for Vera Cruz.

A SHERMAN CLUB has been organized in New York.

A NATIONAL Blaine Cluh has been orgauized in Washington.

A CONSIDERABLE labor agitation prevails at Denver, Colorado.

SEVERAL chiefs have revolted against King John of Ahyeeinia.

SMALLPOX is raging among the Indiane at the Spotted Tail Agency.

THE Pope has issued an encyclical letter condemnatory of divorce.

DEALING in "futures" has heen decided at Chicago to he gamhling.

A TERRIFIC cyclone visited Nashville, Tenn., recently, doing much damage.

SERIOUS complicatione have arisen between England and Persia, touching Herat.

THE Oregon State Woman Suffrage Association adjourned at Portland Feh. 14th.

ENGLAND is to advance Ireland £750,000 inetead of £50,000, ae originally intended.

IT is prohahle that Congreesman Acklin, of Louisiana, will he expelled from the House.

SAMUEL J. ARNOLD, ex-Lieutenant-Governor of Rhode Island, died at Providence recently.

CATTLE are dying off rapidly in British Columbia, owing to the eeverity of the weather.

NAPLES gave Profeseor Nordenskjold a magnificent reception upon his arrival there Saturday.

G. W. CARLTON, tbe slayer of Brummett at Hollister, hae heen held to anewer without hail.

THE Duchees of Marlhorough writee that the danger from famine in Ireland now appeare over.

A MOVEMENT ie on foot in Oregon to induce colored people to emigrate from tbe South to that State.

A RAILWAY train was attacked in Spain Sunday last hy brigande, hut they were driven off hy the guard.

THE losses to farmere of the United Kingdom during 1879 are estimated at from £100,000,000 to £150,000,000.

THE authority of General Marquez ie completely estahlished throughout the peninsula of Lower California.

A DESPERATE, though nneucceesful attempt was recently made hy tbe prisoners in the jail at Cheyenne to eecape.

THE Superintendent of Census knows of no legal reasons why women ehould not be appointed as enumerators.

ONE of the columne in pursuit of Indiane in Arizoua was compelled to retreat on the 8th inet., losing their rations, etc.

AT Newark, N. J., recently, Margaret Meinhoffer and Frauk Lammone were found guilty of the murder of the former'e husband.

The Hofmann Process.

EDITORS PRESS:—In my former letter I wrote tbat Mr. Aaron did not know what he was writing ahout when he stated that he wae in possession of a pile of my tailings assaying $28 per ton. The amount left in the tailinga is of course of no importance, the question heing only how Mr. Aaron came to the expreseed conclueion that those tailinge resulted from my treatment. In his article of Feh. 14th he adds another ahsurd statement, that he "eems" to be the only person hesides myself who treated gold sulphurete at Melrose; he also tries to make eome kind of a compromise hy saying that it sometimes happene to him that too much is left in his tailinge. I can tell him once more that a great many tone of gold sulphurets have heen treated there hy other persons than myself, himself and Stewart, hut if his conclusion is based on his "as I seem," there ends all discuseion. His "seem" does not entitle him to write, "but let it pass, I have no desire to press." I wieh Mr. Aaron to underetand that I do press for a proof, if he doee not like to appear as one who willingly mierepreeente. Blowing does not whitewash; facts prove. G. K.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING FEBRUARY 10TH, 1880.

224,326.—MEAL BIN—C. B. Brown, Placerville, Cal.
224,277.—BOX FOR AMALGAMATOR SPINDLES—E. Coleman, San Francisco.
224,401.—TEN-FOOT RULE—W. J. Derrickson, Clayton, California.
224,284.—WIRE CABLE RAILWAY—W. Eppelsheimer, S.F.
224,414.—GALVANIC BELT—E. J. Fraser, S. F.
224,470.—GRAIN SEPARATOR—W. H. Parrish, Salem, Ogn.
224,357.—GRINDING APPARATUS—J. Rutherford, S. F.
224,483.—HOISTING DEVICE—S. B. Segur, Gold Hill, Nev.
224,364.—STEERING VESSELS—S. F. Tappen, S. F.
224,354.—FAUCET—C. C. Redmond and A. W. White, San Jose, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among tbe patents recently ohtained throngh Dewey & Co.'e SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention :

AIR COMPRESSOR.—Wm. R. Eckart, Virginia City, Nev. Patented Feb. 3, 1880. No. 224,081. The improvements in this invention conеist in a peculiar means of introducing spraye of water to the interior of the cylinder of an air compressing engine, hy which air is cooled. As the pieton approaches one end of the cylinder and gradually compresees the air contained in that part of the cylinder, the epray of water is diecharged from the nozzle in the pieton, eo as to fall though the body of air ae it gradually increases in deneity, and thie water aheorhs the latent heat given out hy the air as it is compressed, eo that the latter may be delivered from the cylinder at a reduced temperature. The action of the continuoue epray, which is advanced as it discharges iuto the hody of air increasing in deneity, ie more effective in cooling it than when diecharged from a etationary jet through tbe eidee of the cylinder. While this action ie taking place in tbe condeneing or compressing end of the cylinder, the jet at the oppoeite side of the piston ie discharging a constant epray into the charge of air which is heing received through the valvee into that end of the cylinder.

CABINET KITCHEN TABLE.—W. H. Wieeter, S. F. Patented Jan. 27, 1880. No 223,828. Thie device is intended to be used in connection with oil-cooking etovee. The hody of the tahle coneiste of a box of sufficient deptb to just inclose the etove or etoves which are to he employed in cooking. The top of the tahle being caloulated to be of the proper hight, the hottom of the receptacle will he of euch an elevation, that the etove will etand eo as to be convenient for use. The hody is eeparated hy a partition into two compartments, one of which eervee to contain the utensils which are to he used about the etove, while the other containe the etove iteelf. In front of tbe stove compartment ie a vertically-eliding diaphragm which forms one end of the tahle when closed, but which may he removed when the table top has heen drawn hack so as to leave the etove compartment entirely open and unimpeded for work. Beneath the tahle is a drawer with compartments, in which may he kept knives, forks, etc. A single leg is attached directly to one end of the top, so that when the top ie cloeed this leg etands cloee to the end of the table body, and ie entirely out of the way.

CRUSHING, GRINDING AND AMALGAMATING MACHINE. — Laneing Haight, Sonora, Cal. Patented Feh. 3, 1880. No. 224,087. In the ordinary form of Chilean mill, in which each of the grinding wheele hae a rotation on its horizontal axie, and also a rotation around the common vertical axis, the wheels are driven hy a pinion and bevel cog-wheel connected with the vertical shaft. In thus driving the wheels from the central vertical ehaft great power ie required, and mills of this claee require eo much power in conecquence, that they have not heen found ae economical as would otherwise have heen the caee. This invention relates to certain improvemente in the ahove class of ore crushers or grinders, and consiets in applying the power directly to the periphery of the rotating crushing wheels hy means of a crown-wheel acting eolely hy friction. It also consists in the combination, with the revolving cruehing wheels, of a peculiarly operating ore feeder, which diethibutee the ore equally under the wheels.

PROCESS FOR THE EXTRACTION OF PRECIOUS METALS FROM ORES.—Ottaker Hofmann, Monitor, Cal. Patented Jan. 27, 1880. No. 223,913. This processa ie intended particularly for heneficiating that class of ores containing both gold and eilver in additioa to hase metal. It consists in a peculiar treatment of the ore; first, hy leaching for the removal of the eilver, and then hy chlorination for the removal of gold. The ore is first submitted to a chloridizing roasting, and the base metale are leached out, the latter operation heing performed in a novel manner, to prevent loss of chloride of eilver witb the base metals, and after the hase metale are removed the eilver is ohtained by leaching in the usual way. After thie operation ie over the mass is thoroughly waehed to remove all chemical ealt, and then impregnated and left in contact with chlorine gas, after which the gold ie extracted hy water and precipitated with eulphate of iron.

DUMPING CAR.—John Jones, Lakeville, Cal. This invention relates to an improved dumping car, and consists in the construction of two separate hoxes or receptacles, one of which discharges at the center and the other at the side, theee hoxes being eo arranged as to he either dumped hy hand or hy the power of the locomotive, as desired, or hoth at the eame time or eeparately. It further coneists in providing a centrally-placed ecraper hetween the rear wheele, which will spread the ballast dumped from the centrally-discharging car, sloping it from the center outwardly, as required. The whole operation of dumping and ecraping may be performed while the train is moving along, hoth the inside and the outeide of the track heing ballasted. When filling in embankmente, etc., where the track ie on treetlee, the ecraper may he dispensed with, but the loads will he dumped within close proximity to the line of the track.

PLAITING MACHINE.—J. E. Chenette, Hillsborough, Oregon. Patented Jan. 27, 1880. No. 223,800. Thie device relates to an improved machine for plaiting goode of all kinds, and it coneiete of a frame baving rollers at each end, over which a carrying helt moves, and a table hetween tbeee rollere eupporte the center of the helt upon its surface. Above this table ie a hinged frame carrying a pressure roller and a knife and knife bar, which are operated by a eyetem of levers eo as to take the goods and paee them heneath the roller in plaits or folde, the belt being at the eame time moved forward eo as to carry the plaite heneath an iron apron, which may have a bot or cold iron placed upon it to fix the plaits and render them permanent.

SPARK-CONTROLLING STACK FOR BOILERS.—John W. Pearce, Suisun, Solano county, Cal. Patented Jan. 13, 1880. No. 223,605. This device relatee to certain improvements in apparatus for controlling or extinguiehing tbe sparks which are ejected from the stack or escape-pipe of engine furnacee and hoilers; and it consiets in a novel combination of a curved pipe leading from the emoke-hox into a receptacle containing water, and in the combination with this pipe, of a fan hlower, which diechargee ite hlaet into the stack to aesiet the draft. The stack ie conetructed with a ewivel joint, which allowe it to be turned to oue side or upward, so ae to provide a clear draft when the hoiler is cold and on first etarting a fire. The water receptacle may have a direction-flue extending upward to aseist in diecharging the emoke.

HORSE POWER.—Robert M. Beehee, Chico, Cal. Patented, Jan. 27, 1880. No. 223,875. This device coneiste in mounting the maeterwheel in a peculiar manner, eo that the mechanism for producing a reciprocating or rotary motion may all he contained within ite circumference. It also relates to certain detaile of construction hy which either a rotary or reciprocating motion may he imparted from the power at the eame time. The whole power, with ite connected driving apparatus, is in a very compact form, and hoth light and strong.

MEASURING FAUCET.—Wm. M. Sack, Oakland, Cal. Patent No. 224,108. Dated Feh. 3, 1880. Thie device relatee to certain improvements in faucets for automatically measuring liquide; and it coneists in certain detaile of conetruction, especially a conneoting air-pipe hetween the two measures, hy which the air expelled hy the liquid entering one is tranamitted to fill the epace in the one heing emptied.

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Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.]

WEDNESDAY M., February 18, 1880.

IRON.—	
American Pig, soft, ton	42 00 @45 00
Scotch Pig, ton	38 00 @44 00
American White Pig, ton	— — @30 00
Oregon Pig, ton	23 00 @35 00
Refined Bar	4½@ 5½
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 16
Plow Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 34
Sheathing, Tinned 14x48	— @ 42
Nails	— @— —
Bolts	38 @— 42
Old	— @ 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	— @— 5½
Bar	— @— 8
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck, " "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.—	
10x14 I C Charcoal	— @10 50
10x14 I C Coke	10 00 @10 00
Banca Tin	— @24 00
Australian	— @23 00
I. C. Charcoal, Roofing 14x20	— @10 00
" " " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	10½@— 11
NAILS.—	
Assorted sizes	6 50@6 75

LUMBER.

WEDNESDAY M., February 18, 1880.

CARGO PRICES OF REDWOOD.		REDWOOD. RETAIL PRICE.	
Rough, M	14 00	Rough, M	18 00
Surface	24 00	Pickets, Rough	15 00
Rustic	24 00	Polished	18 00
do, No. 2	18 00	Fancy	22 50
Flooring	24 00	Siding	20 50
do, No. 2	17 00	Surfaced & Long Beaded	30 00
Beaded Flooring	28 00	Flooring	25 00
Refuse	20 00	do, No. 2	17 00
Half-inch Siding	20 00	Rustic, No. 1	25 00
Refuse	18 00	do, No. 2	18 00
Half-inch Surfaced	24 00	Battens, lineal ft	
Refuse	18 00	Shingles M	2 00
Half-inch Battens	16 00	**PUGET SOUND PINE RETAIL PRICE.**	
Pickets, Rough	11 00	Rough, M	18 00
Rough, Pointed	12 50	Fencing	18 00
Fancy, Pointed	18 00	Laths	3 50
Shingles	1 75		

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, February 18, 3 P. M.

SILVER, ¾ par.

GOLD BARS, 890@910. SILVER BARS, 10@18 ⅌ cent. discount.

EXCHANGE on New York, 25, on London bankers, 49¾@49¾ Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 90@90½

LONDON Consols, 97 7-16; Bonds (4½), 108

QUICKSILVER in S. F., by the flask, ⅌ lb, 39c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending February 17, 1880.

HIGHEST AND LOWEST BAROMETER.

Feb. 11	Feb. 12	Feb. 13	Feb. 14	Feb. 15	Feb. 16	Feb. 17
30.327	30.524	30.514	30.429	30.203	30.252	30.343
29.805	30.327	30.423	30.263	30.051	30.078	30.252

MAXIMUM AND MINIMUM THERMOMETER.

52	52	52	55	55	50	50
41	42	42	43	44	38	38

MEAN DAILY HUMIDITY.

45.7	83	77.3	81.3	78	53	52.7

PREVAILING WIND.

NW	NW	W	SW	W	NW	N

WIND—MILES TRAVELED.

384	248	121	110	110	304	241

STATE OF WEATHER.

Clear.	Clear.	Clear.	Clear.	Fair.	Clear.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

			.14			

Total rain during the season, from July 1, 1879, 12.10 in.

Mining and Other Companies.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Fourth (24th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 29th day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

California and Oregon Land Company.—

Principal place of business, San Francisco, California. Location of works, Lake and other counties, Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 5th day of February, 1880, an assessment of Thirty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary.

Any stock upon which this assessment shall remain unpaid on the 15th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 15th day of April, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, 318 Pine street, room 6, San Francisco, California.

Cataract and Wide West Gravel Mining

Company. Principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 2od day of February, 1880, an assessmeot (No. 2) of Twenty-five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 26½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 8th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 29th day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. B. LAKE, Secretary.

Office, room 18, 26½ Kearny Street, San Francisco Cal.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 40) levied on the Twenty-fourth day of December, 1870, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Ashby, Mark T	7	5000	$500 00
Ashby, Mark T	16	500	50 00
Ashby, Mark T	10	1200	120 00
Drew, J P	254	500	50 00
Drew, J P	255	300	30 00
Drew, J P	256	200	20 00
Drew, J P	257	500	50 00
Drew, J P	258	250	25 00
Dennis, John O	240	440	44 00
Dennie, Delia H	250	500	50 00
Dennie, Della H	251	250	25 00
Plaisted, F A	00	300	30 00
Plaisted, F A	01	100	10 00
Plaisted, F A	92	100	10 00
Plaisted, Thankful P	89	500	50 00
Prince, Chas	222	100	10 00
Prince, Chas	223	100	10 00
Prince, Chas	224	50	5 00

Also, 510 shares of the old issue, equal to 2550 shares of the new issue of the capital stock of the said Gover Mining and Milling Company.

Names.	No. of Certificate.	Old No. Shares.	No. New Shares.	Amount
Dennis, E	174	10	50	$5 00
Dennis, Ezekiel	271	10	50	5 00
Foy, J K	396	50	250	25 00
Foy, J K	400	50	250	25 00
Foy, J K	834	10	50	5 00
Foy, J K	635	10	50	5 00
Foy, J K	630	10	50	5 00
Foy, J K	637	10	50	5 00
Foy, J K	656	00	300	30 00
Marr, C H	018	40	200	20 00
Skinner, E C	441	100	500	50 00
Skinner, E C	619	100	500	50 00
Skinner, E C	620	50	250	25 00

And in accordance with law and an order of the Board of Directors, made on the Twenty-fourth day of December, 1870, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Monday, the First day of March, 1880, at the hour of one o'clock P. M of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

W. O. WILSON, Secretary.

Office, room 8, No. 402 Front street, San Francisco, Cal.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of Works, Placer County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) levied on the 14th day of January, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
J R Robbins, Trustee	13	500	$50 00
J R Robbins, Trustee	17	68	6 80
J R Robbins, Trustee	61	1000	100 00
J R Robbins, Trustee	65	333	33 30
J G Whitney, Trustee	39	1000	100 00
A Hinde	57	1000	100 00
A Hinds	58	1167	116 70
A Hinds	194	500	50 00
A Hinds	198	100	10 00
J K Cooper, Trustee	106	100	10 00
J K Cooper, Trustee	107	100	10 00
J K Cooper, Trustee	108	100	10 00
C A Hunt, Trustee	117	8334	833 40
M Van S Rice	200	500	50 00
M Van S Rice	201	500	50 00
M Van S Rice	202	500	50 00
M Van S Rico	203	500	50 00
T L Bibbins, Truetee	09	100	10 00
T L Bibbins, Trustee	100	100	10 00
T L Bibbins, Trustee	101	100	10 00
T L Bibbine, Trustee	103	50	5 00
T L Bibbine, Trustee	120	100	10 00
T L Bibbine, Trustee	121	100	10 00
T L Bibbins, Trustee	122	100	10 00
T L Bibbins, Trustee	123	100	10 00
T L Bibbine, Trustee	124	100	10 00
T L Bibbins, Trustee	125	500	50 00
T L Bibbins, Trustee	132	1000	100 00
T L Bibbins, Truetee	133	1000	100 00
T L Bibbine, Trustee	134	1000	100 00
T L Bibbins, Trustee	136	1000	100 00
T L Bibbins, Trustee	142	450	45 00
T L Bibbins, Trustee	146	100	10 00
T L Bibbine, Trustee	147	50	5 00
T L Bibbine, Truetee	148	50	5 00
T L Bibbins, Trustee	150	500	50 00
T L Bibbins, Trustee	157	100	10 00
T L Bibbins, Trustee	162	100	10 00
T L Bibbins, Trustee	163	100	10 00
T L Bibbine, Truetee	100	500	50 00
T L Bibbine, Trustee	170	500	50 00
T L Bibbins, Trustee	174	100	10 00
T L Bibbins, Trustee	176	50	5 00
T L Bibbins, Trustee	181	100	10 00
T L Bibbine, Trustee	185	100	10 00
T L Bibbine, Trustee	189	50	5 00
T L Bibbins, Trustee	213	100	10 00
T L Bibbine, Trustee	216	500	50 00
T L Bibbine, Trustee	217	500	50 00
T L Bibbine, Trustee	218	500	50 00
T L Bibbine, Trustee	210	3000	300 00
T L Bibbins, Trustee	220	500	50 00
T L Bibbins, Truetee	221	250	25 00
T L Bibbins, Trustee	222	250	25 00
T L Bibbins, Trustee	223	100	10 00
T L Bibbine, Trustee	232	100	10 00
T L Bibbins, Trustee	225	100	10 00
T L Bibbins, Trustee	226	100	10 00
T L Bibbins, Truetee	227	100	10 00
T L Bibbins, Trustee	228	100	10 00
T L Bibbine, Trustee	229	100	10 00
T L Bibbine, Trustee	230	100	10 00
T L Bibbins, Trustee	231	100	10 00
T L Bibbins, Trustee	233	500	50 00
T L Bibbins, Trustee	234	500	50 00
T L Bibbine, Trustee	235	500	50 00
T L Bibbins, Trustee	230	500	50 00
T L Bibbins, Truetee	237	50	5 00
T L Bibbine, Trustee	254	20	2 00
T L Bibbins, Trustee	262	100	10 00
T L Bibbins, Trustee	263	100	10 00
T L Bibbins, Trustee	264	100	10 00
T L Bibbine, Trustee	265	100	10 00
T L Bibbine, Trustee	266	100	10 00
T L Bibbins, Trustee	267	100	10 00
T L Bibbine, Trustee	268	100	10 00
T L Bibbins, Trustee	269	100	10 00
T L Bibbine, Trustee	270	50	5 00
T L Bibbins, Trustee	271	50	5 00
T L Bibbins, Trustee	272	50	5 00
T L Bibbins, Trustee	273	50	5 00
T L Bibbins, Trustee	293	1000	100 00
T L Bibbins, Trustee	378	97	9 70
T L Bibbins, Trustee	383	150	15 00
T L Bibbins, Trustee	384	50	5 00
T L Bibbins, Trustee	398	50	5 00
T L Bibbine, Trustee	424	100	10 00
T L Bibbins, Trustee	425	100	10 00
T L Bibbins, Trustee	426	100	10 00
T L Bibbins, Trustee	427	100	10 00
T L Bibbins, Trustee	428	100	10 00
T L Bibbins, Trustee	429	100	10 00
T L Bibbins, Trustee	430	100	10 00
T L Bibbins, Trustee	431	100	10 00
T L Bibbins, Trustee	436	1000	100 00
T R Cottrell, Trustee	144	1000	100 00
G R Cottrell, Trustee	166	500	50 00
J Colman, Trustee	354	100	10 00
M French, Trustee	346	1000	100 00
H R Taylor, Trustee	349	50	5 00
Jos F Nounnan, Trustee	361	100	10 00
Jos F Nounnan, Trustee	366	100	10 00
J Griswold, Trustee	441	0000	600 00
Unknown	247	30	3 00
Unknown	249	8	80
Unknown	251	65	0 50
Unknown	258	30	3 00
Unknown	255	30	3 00
Unknown	259	42	4 20
W Townsend, Trustee	410	1000	100 00
W Townsend, Trustee	411	500	50 00
W Townsend, Trustee	412	500	50 00
J M Hinkle, Trustee	300	1700	170 00
T A Wright, Trustee	294	1000	100 00
T A Wright, Trustee	370	300	30 00
T A Wright, Trustee	307	20	2 00
T A Wright, Trustee	309	1000	100 00
J R Robbins	357	20	2 00
G L Waters, Trustee	410	200	20 00
W J Gwynn	402	1000	100 00
Geo O McMullin, Trustee	421	500	50 00
M K Lauden, Trustee	287	250	25 00
M K Laudon, Trustee	288	250	25 00
M K Lauden, Truetee	300	1000	100 00
M K Lauden, Trustee	301	1000	100 00
M K Lauden, Trustee	302	1000	100 00
M K Lauden, Trustee	303	1000	100 00
M K Lauden, Trustee	304	1000	100 00
E A Richardson, Trustee	315	500	50 00
E A Richardson, Trustee	310	500	50 00
E A Richardson, Trustee	317	500	50 00
E A Richardson, Trustee	318	500	50 00
E A Richardson, Trustee	319	500	50 00
E A Richardson, Trustee	320	500	50 00
E A Richardson, Trustee	321	500	50 00
E A Richardson, Trustee	322	500	50 00
E A Richardson, Trustee	323	500	50 00
E A Richardson, Trustee	324	500	50 00
E A Richardson, Trustee	325	500	50 00
E A Richardson, Trustee	326	500	50 00
E A Richardson, Trustee	327	500	50 00
E A Richardson, Trustee	328	500	50 00
E A Richardson, Trustee	329	500	50 00
E A Richardson, Trustee	330	500	50 00
A H Todd & Co., Trustee	418	200	20 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 314 Bush street, San Francisco, on Thursday, the 11th day of March, 1880, at the hour of —o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

T. L. BIBBINS, Secretary.

Office—314 Bush street, San Francisco, California.

STOCK DIVIDEND.

At a special meeting of the stockholders of the

SOLID SILVER

Gold and Silver Mining Company,

Held on the 30th day of January, 1880, at their office, No. 320 Sansome street, San Francisco, California, a

Stock Dividend of 10 Per Cent.

Was declared, payable on and after the 15th day of February, 1880.

R. HEWSON, Secretary.

DIVIDEND NOTICE.

Office of the

BLACK BEAR QUARTZ MINING COMPANY

Room 13, Safe Deposit Building, San Francisco,

February 16th, 1880.

A dividend (No. 70) of Twenty-five (25) cents per share has been declared on the capital stock of the BLACK BEAR QUARTZ MINING COMPANY, payable immediately.

WM. LETTS OLIVER, Secretary.

OFFICE OF THE

Original Gold Hill Gold and Silver Mining Company,

Gold Hill Mining District, Storey County, Nevada.

NOTICE!

A special meeting of the stockholders of the Original Gold Hill Gold and Silver Mining Company will be held at the office of the Company, rooms 3 and 4, second floor, 300 California street, San Francisco, on Monday, the 15th day of March, 1880, at 2 o'clock P. M., for the purpose of disposing of the stock belonging to the Company, and such other business as may legally come before said meeting. Transfer books will be closed on Saturday, the 6th day of March, 1880, at 3 o'clock P. M

J. M. BUFFINGTON, Secretary.

DIVIDEND NOTICE.

Office of the

EUREKA CONSOLIDATED MINING CO.,

Room 87, Nevada Block, San Francisco,

February 14th, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 52) of Thirty cents per share was declared, payable on Friday, February 20th, 1880. Transfer books closed until the 21st instant.

P. JACOBUS, Asst Secretary.

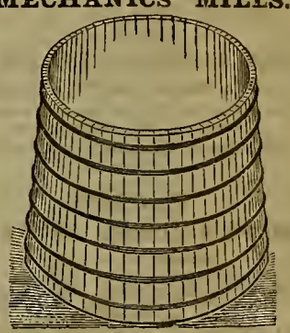
STOCKHOLDERS MEETING.

The annual meeting of the stockholders of the AMERICAN MINING AND DREDGING COMPANY for the election of Directors to serve during the ensuing year, will be held in the office of the Company, No. 220 Sansome street, San Francisco, California, at 12 M., on Monday, March 8, 1880.

E. MOREAU, Secretary.

February 19th, 1880.

MECHANICS' MILLS.



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Mechanics' Mills, corner Mission and Fremont street.

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BALDWIN'S THEATER.

THOMAS MAGUIRE.....Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

CLARA MORRIS.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE.....Leesee and Manager

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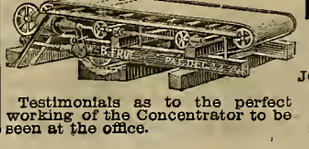

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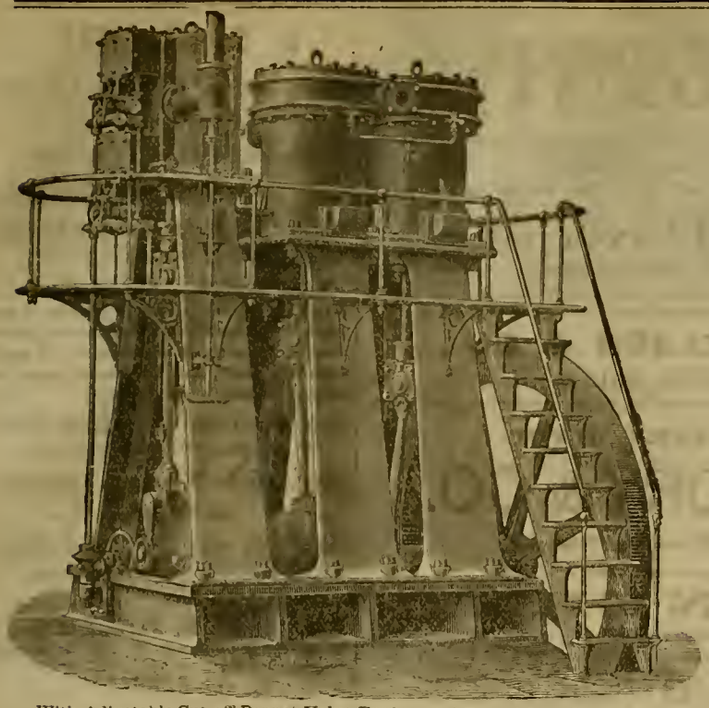

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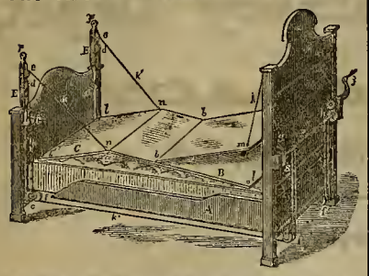

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SAN FRANCISCO, SATURDAY, FEBRUARY 28, 1880.

VOLUME XL Number 9.

The Æsthetics of Labor.

Labor is not all drudgery. Some of its phases are of the most elevated character. Some of its conceptions rise above the lower grade of sturdy toil into the realms of sublimity. Some of its productions attain the most exquisite perfection. It does not always cling to the absolute of necessity; it reaches at times to the accomplishment of man's beatitude. It is not always a delver; it assumes when requisite the embodiment of the highest portraiture of excellence. It visits the toiler in dreams of marvelous felicity and presents to him visions of enchanting loveliness. It bears him from the harsh discipline of earth to the soothing freedom of celestial liberty. Under its æsthetic influence he is no longer a being of flesh and blood; he is transformed to an angel of light, and leaving his toil-strained muscles and thoughts upon earth he soars into the realms of ecstatic bliss and harmonious repose. In moments like this the materialization of his wildest dreams gives to his fellow men such dazzling gleams of supernal bliss, or such proofs of beneficial utility, as they had never before experienced, and opens to them a wide expanse wherein is ever to be found a solace for the harsh fatigue of strenuous toil. In proof of this, the delineations upon the canvas of the idealistic sentiments of the world's most renowned painters; or the creation from the quarry's rough block of the entrancing forms of beauty by the hands of sculptors of renown; or the soul-stirring thoughts of the poet's most harmonious song; or the swaying influence of the orator's exciting and well balanced words; or the almost vital machinery which the inventor has commanded into existence as the slave to perform tasks of utility for mankind; each and all, and even more than have been mentioned, can be cited without apprehension of rebuttal.

In the lone cabin of the solitary laborer where only desolation and privation are evinced, there hangs upon the rough and smoke-dimmed wall the artist's little sketch of a sunny landscape, in which the shadows of flowers and foliage fall lightly upon the bosom of the unrippled stream. As he looks upon the picture his somber home seems lighted by gleams from the view before him, and wafted by memory back to by-gone hours, his soul rejoices awhile in the glad presence of loved ones never to be forgotten.

In the scantily apportioned home of the daily toiler there rests upon a little shelf a plaster copy of some form of loveliness, which erst the sculptor's hand had wrought from inanimate marble. In the contemplation of this portrayal of beauty, he forgets his own rough life and this delineation of attractiveness holds him awhile entranced.

Upon the soiled table of the over-worked man there lies the poet's volume with its ennobling and soothing lines of sympathetic thought. In the rhythmic words and congenial sentiments he finds repose from his weariness and a balm for his sorrows and his griefs.

With his day's task performed and lingering on his homeward way, the artisan finds his very being stirred to its inmost depths and lifted out of this sphere of muscular exertion, as he listens to the eloquence of the orator whose sentences fall upon his ear.

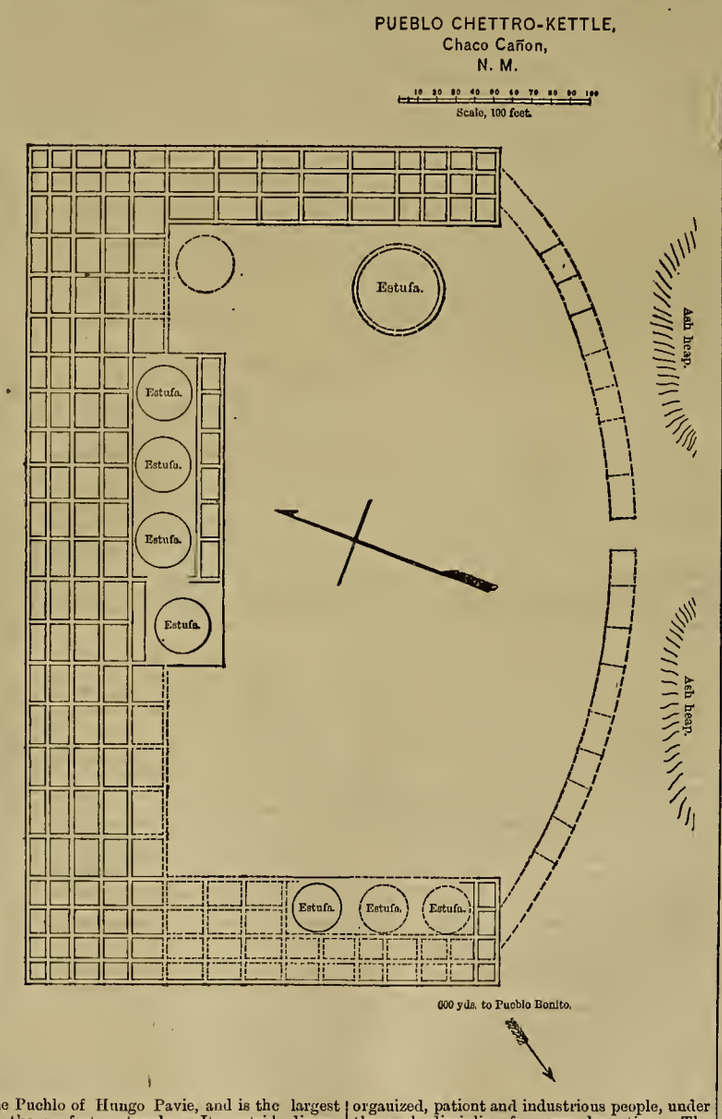
In the din of the factory there ever rises a pean to the honor of labor in the hum of the tireless and faithfully-working machine. Wherever the son of toil or even the slave of idleness may chance to be, there are to be found irrefutable proofs of the æsthetics of labor, for the producers of all these harmonious results have been and are diligent workers. What other of human efforts save those of labor could produce these wondrous effects; could awaken sensations of such pure unalloyed delight, or arouse the better moods of soul-life, that under the harsh pressure of the vicissitudes of existence were suppressed and forced into apathetic quietude?

In the wide field of labor there are those whose destiny is to delve and struggle, while others of their fellow workmen find their allotted tasks in the higher plane of æsthetic productions, whose harmony and elegance are intended to soothe, elevate and adorn their seemingly less gifted brethren. There is a grandeur in labor which elevates it at times to the higher grade of true æstheticism.

Pueblo of Chettro Kettle.

In recent numbers we have referred to the Aztec ruins in New Mexico, and given engravings of the ruins of the ancient towns. We give this week another illustration, showing the ruins of the Pueblo of Chettro Kettle, or the Rain Pueblo. This is of the same pattern as the Pueblo of Hungo Pavie, and is the largest of the perfect rectangles. Its outside dimensions are 440 by 250 feet. A semi-circular wall connects the two side wings. There are seven distinctly-marked *estufas*, four near the center of the main building and three near the end of the west wing. The walls of the Pueblo at the northeast corner are fully 35 feet in hight, showing four floors plainly and with indications of a fifth.

In this ruin there was at one time a line of wall running around three sides of the building, 935 feet in length and about 40 feet in hight, giving 37,400 square feet of surface, and as an average of 50 pieces of stone appeared within the space of every square foot, this would give nearly 2,000,000 pieces for the outer surface of the outer wall alone; multiply this by the opposite surface, and also by the interior and transverse lines of masonry, and, supposing a symmetrical terracing, we will find that it will swell the total up into more than 30,000,000, embraced within about 315,000 cubic feet of masonry. These millions of pieces had to be quarried, dressed roughly to fit their places, and carefully adapted to it; the massive timbers had to be brought from a considerable distance, cut and fitted to their places in the wall and then covered with other courses; and then the other details of windows and roof making, plastering and construction of ladders, must have employed a large body of intelligent, well-



organized, patient and industrious people, under thorough discipline for a very long time. The remains of the wall that inclosed the court show it to have been of stone and to have been divided into apartments.

THE North Noonday mining company forcibly took possession of the works of the Orient mine on Tuesday. A lawsuit is pending between the companies.

THE estate of the late Charles Bonner, once Superintendent of the Gould & Curry mine, and well-known in mining circles is valued at $300,000.

THE Dominion House at Ottawa has voted $100,000 for the Irish relief fund.

Effect of Labor-Saving Machinery.

The statement is frequently made that labor-saving machines deprive workingmen of employment. That they take the means of earning an existence from those who have to work for a living. The immense number of yards of fabrics which the cotton mills turn out annually are frequently made the basis of specious arguments to sustain the views of those who hold to that opinion. They state that if the cotton clothes were woven by hand looms, their manufacture would give employment to tens of thousands of operatives. There is no denying the fact that if the same number of yards of these goods that are now woven by steam or water power were made by muscular labor, that it would be as stated. But would the same quantity of goods be made in the latter case? Most certainly not. There could not be a supply of raw material placed in the reach of so many individuals to meet the manufacture. Or if we admit that such could be the case, the cost of production and transportation would be so great that they would amount to prohibition of the consumption. There could not be found purchasers enough who would be able to indulge in their use. There would consequently be a rapid decrease in the demand; the production would also meet with a like effect, and thousands of producers would be thrown out of employment. Nor would the producers only be forced into idleness. All the vast array of workers in every department of labor who now aid in the accessory spheres of action, which the raising and transporting of the cotton requires, would find their ranks rapidly thinned out. Commerce would be suspended; the working of metals now used in the machinery, in the means of production and transit, would cease; and there is not a branch of human industry but that would suffer. All this evil would be created upon the annihilation of even the one item of cotton manufacture by labor-saving machinery.

It would be still more marked if labor-saving machinery should be taken away from mining. If the pick, the sledge and drill—for they are the simplest of labor-saving implements—were abolished, how deep could man delve with the use of his hands alone? Or if they were still kept in use, how deep could the mines be sunk without the use of hoisting or pumping machinery? How much ore could be crushed were physical instead of mechanical power employed? What vast amounts of treasure would never be reached that now are brought from the depths of the mines. How few mines would be worked compared to the multitudes that are now in successful operation? How many thousands of busy hands would be idle that are now meeting constant employment? The products of the mines would be meager and unimportant. No deep work could be accomplished. In mining, certainly, labor-saving machinery gives work to tens of thousands that could not find it if such appliances were not in vogue. There would not be a mining camp in existence if mechanical work was annihilated. Where now the shrill steam-whistle utters its piercing shriek to call the miner to his toil or tell him that his hour of rest has come, there would be the utter silence and the oppressive quietude of desolation. Where now the powerful engine wields its mighty energies to perform its task, there would be stillness and immobility of unproductive inertia. No footsteps would fall where now the gangs of miners gather at the verge of the deep and darksome shaft. The boom of the underground blast would never be heard, nor would the sound of labor stir the open air. Mining would expire if divested of machinery. It is labor-saving machinery that sustains it, and creates work for the miners.

Look where we may, into any department of labor, and unless mechanical means are called to its aid it presents but a sorry aspect, holds but a trivial position, and counts but a very limited number of employees. But no sooner is machinery employed than its growth is rapidly extended and its ranks of workers greatly augmented. Labor-saving machinery not only increases the production, but it also opens a wider field for employment.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

A Sucking Fish or Remora.

Editors Press:—A remora or sucking fish, was not very long eince taken from the hody of a shark to which it had attached itself, and which had wandered into our hay. The Echineidæ or remoras are a very curious tribe of fishes. It is hy no means easy to say what is the true habitat of any of the species, for they fasten themselves by their sucker to any large swimming or floating object, such as a shark or a ship, for the remora isn't particular in its choice, and allow themselves to he carried wherever that object goes, so that the same species may he taken in localities thousands of miles apart.

But the remora is not a fixture like a barnacle; it can loose its hold at pleasure, and its object in attaching itself to a large carnivorous fish or to a ship, is the same ae that whioh attaches a oertain class of human beings to their richer or their more energetic neighhors. It is there for what it can get—for the crumbs and morsels of loaves and fishes which it has not the ahility to cateh entire or alive.

The sucker is not upon the uuder side like that of the family of fishes known as *cyclopteridæ*, of which we have two species in this bay, but is upon the back of the head, and con· eiste of a series of parallel transverse horizontal hars within a border or frame, and resemhling nothing so much as a section of a window blind. The action of these laminæ, the upper edge of which can he raised or lowered so as to change the angle, creates the vacuum which enables the creature to adhere. Precisely the same arrangement of transverse parallel laminæ occurs upon the feet of a large tribe of small lizards known as Geckoes, abundant in tropical regions. By them the Geckoes can walk along walls and on ceilings with the greatest assurance.

If now we look more closely at the remora, we shall find that in its general characteristics it resemhles that large class of fishes which have the anterior part of their dorsal fin composed of spinous rays, and the posterior part of soft and jointed rays; yet, curiously enough, it has no spines upon its back, bnt a soft-rayed fin only. What has become of the first or epinous dorsal? The answer will be given hy the sucker, which is simply a modified first dorsal, every bar or lamina representing a ray.

The eucker is in fact a heautiful example of that adaptation of existing parts to new uses which abound in organic life, and which are so many proofs of the evolutional unity of living heings.

When, in a given tribe of creatures haviug a certain definite structure, tho habits and environment of an animal necessitate a change in that structure, nature does not create a new organ, but alters an old one. The remora, unahle to compete with the swifter denizens of the sea, gradually became more and more of a commensal or hanger-on, and gradually became more adapted for such a life by tbe peculiar development of its first dorsal fin. In the cyclopterids or lump-suckere the same end is attained by the union of the ventrals into a circular sucking disk.

To give an example among mammals, the higher monkeys are specialized for climbing hy the power of grasping possessed hy all four of their extremities, which thus become hands. In many of the lower, which have the thumh so ahorted that the other fingers can only take a hook-like grasp, the tail comes into use as a fifth hand. The arboreal sloths, whose clumsy paws are quite a contrast to the hands of the monkeys, hold to the hranches hy their long reversed curved claws, which form a powerful hook, and most other climhing mammals ascend by the hold ohtained upon the inequalities of the surface by the sharp claws of all four of their feet.

W. N. L.

More new Mines.—The Tucson (Arizona) *Citizen*, of February 7th, contains the following: Some exceedingly rich mines have been discovered on the east side of the Graham mountains, in Stockton's pass, about twenty-two miles from Safford and twelve from Fort Grant. The first locations here were made hy B. D. Jones, hrother of Senator Jones, and since that time locations have been made hy others. The most important claims developed are the Delaware and the Pioneer. The ledge is two and a half to three feet wide and traceahle from 1,800 to 1,900 feet without a break. The assays are $2,300 in silver and $722 in gold. The claims are situated on the north eide and in plain sight of the main traveled road. The discoveriee have created considerahle excitement, and many prospectors are flocking tbere. One of Jones' mines, the Garibalda, carries magnificent gold ore, the shining particles heing visihle in every piece of rock. There is plenty of wood, water and grass in the vicinity, and a town site has already been located.

The bullion shipments from Salt Lake City continue to increase daily, and the prospects are that they will soon reach $200,000 weekly. —*Salt Lake Tribune.*

Slate Discovery in Kern County.

It is reported that Mr. Barker, of the Rio Bravo ranch, has found an extensive quarry of slate. It is on land helonging to the S. P. R. R., a few miles from the track. An expert was sent up by the company last week, and he reports it fully equal to that produced in the Eastern States or Europe. This species of rock formation is ahundant in thie State and in overy part of the world; hut the kind useful in the arts and mannfactures is scarce and of great commercial value if found where facilities for transportation exist. This is the first, we helieve, that has heen found in thie State in a situation where it could he made available.

According to the hest authorities on the subject, good slate is distinguished by an appearance of compactness and solidity in the blocks, with nothing to suggest their fissile character; and yet this should he so perfect that when fresh from the quarry the hlocks may he split with greater ease than redwood timber, and into sheets of any desired thinness. The faces should he perfectly smooth and parallel without any curvatures and irregularities. There should be no linee of cross fracture that should prevent their breaking in any one direction more than another, and when oue is halanced on the finger and struck, it ehould give forth a clear ringing sound. These characteristics are all exhibited in the rock taken from the surface of this quarry, an unusual circumstance in the best quarriee that have hitherto heen discovered and not occurring, as a general thing, until considerahle depth has been attained.

Quarriee of great extent have been worked in Great Britain from time immemorial, yielding immense annual revenues. Up to 1850, and even later, vast quantitiee of slate were imported into the Uuited States.

Subsequently quarries were opened in the New England States, Maryland, Pennsylvania, New Jersey and other places that have since mainly supplied the home demand, furnishing profitahle employment to great numbers and large iucomes to the owners. Thriving towns and villages have grown up wherever these quarries exist. One of these in New Jersey is called Slateford. The demand in the Eastern States for roofing slate is constantly increasing, shingles going more and more out of favor. It is not affected by changes of temperature like the coverings of metal, is fire-proof and presents an attractive appearance.

The other purposes to which it is applied are numerous. It is in great request for pavements, and various ornamental and useful articles are prepared from it. By a process of enameling that is carried on in an extensive scale in various establishments in Vermont, and in the cities of Boston, Philadelphia and other places it is made to imitate granite, marble, lapie lazuli, jasper, malachite, etc., and made into slabs, tiles and mantelpieces, and moldinge for interior decorations, and for articlee of furniture, such as tahle-tops, billiard tables, sinks, tubs for hathing, etc.—*Kern County Californian, Feb. 5th.*

Old Mowry Mine.—The Mowry mine was discovered and located by a Mexican in the winter of 1858-9, and was purchased from him for $10 hy Gen. Ewell, then Captain and commanding officer at Fort Buchanan. Work was done enough to demonstrate its extent and great value, and it was bought hy Lieut. Mowry for $25,000. Mowry went to New York, and succeeded in interesting a number of prominent men there in the property, and secured sufficient money to erect smelting works, and worked the mine with profit to himself and associates. He was arrested in 1862, while at the furnace, and in the hight of his prosperity. Gen. Carleton, of the California troops, made the arreston the pretext that Mowry was a Southern sympathizer. Mowry was sent to Yuma, and remained there many monthe. Carleton's troops happened to be old California miners, and started the furnaces, reduced the ores, and returned home "loaded with silver." After the troops left the property was leased hy Carleton to Garrey, who realized between $40,000 and $50,000 from it and drew out. It was then worked by others until Mowry returned to Arizona and disposed of the property to Mr. D. A. Bennett. Mr. B. worked it for three years, shipping to San Francisco large quantities of bullion. Work was then suspended, and a U. S. patent applied for as the Enterprise mine. The greatest depth sunk on the property is 400 feet—shaft 350 feet and winze 50 feet. The lowest level is 100 feet from wall to wall. It is a large and valuable deposit of low-grade carbonate ore, the ledge being traceahle for miles. It is 75 miles southeast of Tucson, in a rich mineral belt, and its history gives proof of its merits.—*Pima County Record, Jan. 24.*

Gold Discoveries at Copperopolis.—Correspondence Stockton *Independent:* The quartz mania has not abated, in fact, we think it is increasing in violence, and quartz, more quartz, ie all one can hear. Another rich strike has added fresh fuel to the fire, and it is now raging more than ever. Men, women and children have become infected with it, and our hills, valleys and ravines are teeming with the eager expectants of striking a "rich bonanza." The latest discovery made is rich almost heyond belief, the rock being *alive* with *gold*, and the dirt in which it is embedded, also. Scarcely a day passes without some one being made happy by the discovery of gold-bearing quartz, and we are in high good humor over the increasing prosperity (present and prospective) of our town.

The Debris Question Under Discussion.

The Joint Committee on Mines, Mining Debris and Water Rights held a meeting February 18th, in the Senate chamber, to hear the explanation of the hill introduced in the Assemhly by Brown, relative to the solution of the mining debris question, and also to propouud interrogations to the State Engineer, W. Hammond Hall, and Col. Mendell, U. S. Engineer. The Senate chamher was crowded with members of hoth houses, and miners and farmers interested in the solution of the great problem. Mr. Parks went over the causes which have in the past 30 years filled up the heds of the principal rivers of the State, the diffieulties hetween the miners and the farmers, and the means suggested for an adjustment of the trouble. The bill provides for the mapping out into three great districts of all the lands interested in the mining debris question, the mining and agricultural lands to hear an equal share of the cost of diverting the debris into the mountain gulches. He expressed the opinion that the dehris difficulty in the whole Sacramento valley could be settled for $5,000,000, and that the tax therefor would not be more than one-half of 1% of the valuation of all the property interested. He thought the figure would he below that percentage, and suggested an amendment to the bill that the amount should be limited in the hill to three-quarters of 1%. The heavy debris could be lodged in the mountains, and the lighter would he held in euspeusion in the rivers and swept out to the sea. The effect would be to scour out the rivers to their depth years ago, which would relieve the State from the danger of the recurrence of floods, besides adding between 300,000 and 400,000 acres to the lands capable of cultivation.

In reply to inquiries, Mr. Hall stated that the cost of holding back the debris would not be disproportionate to the henefits conferred, provided that mountain and valley alike were taxed. The bill, as he understood it, did not contemplate including San Francisco in the districts to be assessed, nor any of the counties south of it. He stated that work could he so far advanced this year as to protect the Yuha and Bear rivers and surrounding lands from debris.

Col. Mendell entered into a longthened explanation, stating that he thought tbat if the United States did not take this matter in hand the State certainly should. He was not prepared to state the cost of the work. He said, however, that if the tailings were uot taken care of, in the course of some years there would be no rivers, and that the plan of deopening the channel of the rivers, retaining the debris and reclaiming lands, would have to be a general one, else but little could be accomplished.

The Bulwer-Standard Mill.

This magnificent quartz mill consiste of 30 stamps, and ie built after the most approved plan. The ore will be run from the tunnel direct to the ore-house, into two large hins, where it will be hroken aud screened, falling into the main body of the ore-house that is connected with the battories hy automatic feeders, self-adjustable. These feeders are a model of mechanical ingenuity and well worth a visit. There are two distinct batteries of 15 stamps, parallel with each other, working from pulleys on the same shaft placed on a center shaft between the hatteries. The capacity of the batteriee is about 100 tons a day, depending on the character of the rock. The slum-tanks are ranged on each side of the amalgamating room and are supplied with centrifugal pumps, and hose to charge the pans. The pulp is carried from the hatteries to the slum-tanks in eluice-hoxes with openings over each tank to fill them, requiring hut one man on each side to fill the tanks and charge the pans. The pans are set parallel with each line of slum-tanks and are each furnished with a patent steam quicksilver pump. This pump saves handling of the quicksilver when cleaning up or charging the pans. Between the lines of pans is one open passageway giving plenty of room for working purposes. The engine that drives this mass of machinery is a 225-horse power Poppet-valve, set in a parlor adjoining the amalgamating room. It worke as smoothly and easily as a noiseless sewing machine, and is a splendid piece of mechanism, fitted up with tho latest improvements and handles the mill machinery with ease.

The boiler-room, adjoining the engine-room, is large and spacioue, with two sets of boilers, the steam drums as large as hoilers for ordinary use. Oae of the boiler furnaces is built after the old style, the other set is fitted up with Box's patent fuel-saving furnace. It is claimed to save one-eighth of the wood to do the same work as the old style of furnace. They are in use at the Justice mine, Gold Hill, for the past 18 months, and no doubt its competitor hy its side will soon be replaced by the Box patent. The arrangement of this furnace, or its novelty in patent parlance, is the partition fire wall that extends close to the boilers, an arched opening heing left on a level with the grate hars for draft, and extending hack to an overhanging wall. The grate hars are set at an angle and the coals from the furnace form a bed between the partitiou and the rear hanging wall; the draft carries the flames, gases, etc., over this bed of coals, a great heat being generated, igniting the gases and utilizing the heat for steam purposes; that with the old style of furuace passed away and up the smoke stack without igniting. It strikes us as heing a valuahle invention and one that must make a great saving in wood, and to mills or mines using large quantities this should be a material object.

Bodie can now boast of 114 stamps in active operation, and in a few days 10 more at the Spaulding mill will he started, when 124 etamps will be crushing away day and night. This will more than double the former yield of bullion from Bodie.—*Bodie News.*

Mining Tax in Nevada.

Below will be found the Assessor's report of tax on the net proceeds of the mines for the quarter ending December 31, 1879. The report makes the total tax of the mines $22,048.79; tailings, $302.27; total, $22,346.06. For the quarter ending September 30th, the mines paid taxes amounting to $13,266.04, and the tailings mills paid $1,340.98; total, $14,607.12. Excess of the December quarter over that of September, $7,748.94, heing an increase of over 50% on the whole amount, and over 66% on the yield of the mines.

An examiatiou of the two reports shows a remarkable falling off in the tailings, caused principally by the closing down of the Omega mill early in the December quarter. The main new feature of the present abstract consists in the fact that the Union appears in it for the first time, and showe the ore worked hy that mine to be of high grade.

Abstract statement from the quarterly assessment roll of the proceeds of the mines of Storey county, for the quarter ending Decemher 31st, 1879:

Mine.	Tons Ext'd.	Value pr. Ton.	Gross Yield.	Total Cost.	Net yield or Val. on which Tax Levied.
California	1,240	$35	$385,025	$230,301	$154,010
Con. Virg.	14,493	38	548,675	300,757	247,918
Con. Imp'l.	2,881	13	37,450	44,317	7,490
Monte Cristo	478	11	5,258	4,780	525
Justice	1,183	12	14,330	9,068	5,762
Ophir	4,380	56	245,163	300,781	93,965
Union Con.	5,201	52	277,283	277,979	110,913

A New Device for the Protection of Miners' Lives.—For a week now there has been in use at the Hale & Norcross shaft a simple hut effeetual contrivance for preventing miners ascending and descending the shaft from falling from the cage. The middle hraces of the cage have heen extended some eight or ten inchee and on one side eyes formed for hinges. Into these eyes corresponding hinges of a gate are dropped and the gate fastened on the other side by a pin from top to bottom. These gates have §-inch iron rods running up and down four inches apart, the tops and bottoms fastened into iron hars ½-inch by 1½-inch. The whole contrivance weighs 57 pounds, and costs, including the time of the blacksmith in making it, $11½. It is impossible for a man to fall from tho cage when it is in place. A small har of iron runs from tbe hrace to the bottom of the cages at the eides to prevent any one slipping through in that direction. These gates come up breast high, so that no one can fall over them, and still afford every opportunity for signaling while tho cage is in motion. Should anything occur which would make it advisable for the miners to jump from the cage to the timbers, the pins can he taken out in a second and the gates dropped down the shaft, as no one works in the hottom. This simply contrivance has every advantage over a gate ewinging out or in, since euch a gate cannot be used in the shaft when the men are on the cage, as it could not then swing in, and if swung out would strike the timbers and injure the men. The miners at tho Hale & Norcross have all expressed their entire satisfaction with the arrangement, and say they experience a sense of eecurity while going up and down which they never felt before. Two men have been killed at the mine within the last five months hy falling from the cage, and when the first was killed, Superintendent Deidesheimer ordered protection provided against such accidents, hut his orders were not carried out. It is safe to say that no more men will be killed in that way while this simple invention is in uee.—*Gold Hill News.*

Floating Island.—Among the many natnral curiosities of Tuolumne county it is not generally known that there is a "floating island." Up in the "Siskiyous," lying like a pearl in the great mountain chain, ie Squaw lake, a beautiful shcet of water now utilized by a mining company as a reservoir. For many yeare the lake has been a favorite and delightful resort for fishing parties, and contained nearly in its center an island, comprising about an acre of ground covered with luxuriant grass and a growth of willow and alder. It was never dreamed that the pretty little island was not terra firma, hut when the bulkhead across the outlet of the lake dammed up its waters, the island rose slowly until it had been elevated fully 16 feet above its original level. It would be a question for the naturalist rather than the geologist to determine the age of this floating island, as it is evidently made up entirely of decayed vegetation. Perhaps at some remote period the roots of a tree, uptorn hy the mountain storm, drifting out in the lake, formed the nucleus from which the island has grown, but it seems singular that it should have remained anchored aud unchangeable in its position. The locality is much frequented hy pleasure seekers who will bereafter notice the increased elevation.—*Jacksonville Sentinel.*

MECHANICAL PROGRESS.

Dephosphorization of Iron.

[Condensed from a portion of a paper read before the Society of Civil Engineers, of Paris, by F. GAUTIER, July 4, 1879.]

Dephosphorization is a problem of great importauce in metallurgy. In the proportion of 1% phosphorus renders iron easily fusible, s property precious in tha feundry, without deubt, but unfortuaately accompaaied hy a very great fragility. Oue-half per ceat. renders the ireu more malleahle aud easier to weld when het, hut the fiber is replaced by a flat grain without resistance.

In steel lew in carbon, 0.1% of phosphoras renders rolling impossible, prevents tempering and gives n brittle metal uafit for sny use.

Uufortuuately, phosphorus is of very common occurreace in tbe ores of irou. In the are tho phospharus is gensrnlly iu the state af phoephate of liaie or alumiaa. These phosphates aro not decomposnble hy heat, and are irreducible by carhon or carbonic oxide. In order to displace the phosphoric acid, the presence of silica is necesoary. This forms an earthy silicate, and then permits the esrbon, or carbonic oxido, to exercise ite reducing action aad to free the phosphorus.

In the blast furnaace aad in preseaco of an excess of iron, theee reactioas lead finally to the production of phosphuret of iron, wbich dissemiaatee itself through the motal. When the phosphorus is in the state of metallic phosphate, its reductioa takes placo without tbe iaterveatioa of silica, and at a lower temperature. It is thus that sll the phosphorus of the furaace burdea, ore, flux aad fuel concentrates itself in the pig metal.

Attempts at dephosphorization have been made in the Bohemian works, st Kladno, in which they sought to dissolve the phosphste of lime aud of alumina of the ore by scouriag with a eolution of sulphurous acid. They only succeeded in a reduction of 30%, and this at au expense of 30 fraacs ($6) per ton of metal. It was a cumbrous process, uot practical, and has heen almost forgotten. What is to be done, then? Attsck the pig metal direct. To be bettsr ahle to jadge of the real progress, it will be well to review the different methods employed.

Dephosphorization in Puddling.

In the reverheratory furnace, on a cast-iron bed-plate covered with oxide of iroa, tho metal ie kept in a liquid stste. The oxidizing action produced by the contact with the oxide of iron, by the free oxygen from the gsses of the hearth, and hy the air, which enters at the doors, is further fscilitsted by the energetic working of the metal, which reaewe the exposed surfaces. This coastitutes the work of puddling.

The most oxidizahle bodies, silicium and manganese, are the first to pass off in the elag. As to the phosphorus, the fiasl elimination of which generally attains to 60%, it is usually admitted that it is transformed in part into phosphate of iron, but ahove everything elee ite elimination is attributed to the liquation. When the metal clears itself of foreign elements that it contains, it hecomes less fusible, and passes into a solid etate in the midst of liquid slsg, which surrounds it. It is at this moment thst occurs the greatest purification during the puddling.

The liquation certainly playe a very important *role*, but the single process of the fusion of the iron in contact with the oxide of iron of the hed of the furnace, constitutes a dephosphorization of 40%.

Special Dephosphorization in Puddling with Manganiferous Iron.

When puddling has for its ohject the production af a specisIly pure iron, it is nccomplished by adding mangsnese. This is a very recent industry, which had its origin in Belgium, wbence it afterwards extended into Germany and a part of France. To the iron contsining phosphorus is added spiegeleisen in such quautities as to have in the mixture from 2% to 3% of maugaaese; then it is puddled at a high temperature. The presence of manganese retards the purification and increases the amount of necessary working. The waste or loss is not very great, because it is hidden by a considerable consumption of scrap iron, which is used to maiutain or keep up the furnace bed, but the dephosphorization is energetic and can attain to 97%. With an iron containing 1.6% of phosphorus, which, without manganese, would yield after puddling 0.6% to 0.7%, there is often obtained an iron which contains only a half-thousandth of phosphorus.

The Heaton Procese

Created some stir in England 10 years ago, and has been the object of very complete and interesting studies on the part of M. Gruner.

Into a cylindrical vessel of sheet iron, lined with refractory earth, is poured the molten metal. The bottom of this vessel is a plate of cast iron, or, hetter still, a piece of sheet iron, four millimeters thick, which is pierced by holes and dcstiaed to be melted down by contact with the molten iron, wbich then tumhles into a sort of caldron containing nitrate of soda. This salt is decomposed instantly, and produces compounds of oxygen and nitrogen, which traverse the column of liquid metal, and make it undergo in a few moments of time an energetic purification. An iron with 1.5% of phosphorus gave a half solid praduct, still hsving 0.6 to 0.9 of phosaphorus aad 0.14 to 0.16 of silicn. This was not cast iron, for the decarburation was considerable, and ncither was it wrought iron nor steel. The wasta was only 5% ar 0%, but the amount of nitrate used anght to be mere than 10%, in arder to obtain good results. Ia short, the process was iacomplete, expensivc, and cquld only furnish the first msterial for the manufacture of steel in the Martin-Siemens furnace; therefore it was aot used.

Here stops the account of meaus fer dephosphorization placed at tho disposal of metallurgists, nntil within the last few yesrs.

The Beseemer and Martin-Siemens Processes.

The Bessemer process gives ne purification whatever, but oa the ceatrary, a concentratiea of the phosphorus ia proportion to the waste. It is thus that with Cleveland iroa, contaiaing 1.46% of phosphorus, Mr. I. Lowthian Bell obtained steel with 1.62%, aud at the Essen Steel Works; with the same ireu, was produced a stesl contaiaiug 1.77%.

In the Martiu-Siemens process, which produces steel on the hed-plate of a reverberatory furnace by melting n mixture of cast irea and scrsp, either wrought irou or steel, there is the ssme coaceatration of phosphorus. Wheuce comes, then, this aaomaly?

The Theory of Dephosphorization

Is not yet complete, but we agree more or less ia ackaowledgiag that several conditians concur to produce purificatioa.

1. Oxidiziag actioa, for transforming the phosphorus into phosphoric acid.

2. Basic slag, in order to permit the absorptioa of silicn, whioh is of necessity encountsred ia nll metallurgical operntioas, and to facilitate the combiaatiou of tbe phosphoric acid produced.

3. Liquation, or the separation of the solid product from the phosphoric slag which proceed from the refiniag and flow off in a liquid state.

Finally, the temperature, to which of late has been attributed a certain iafluence, either that its elevation decomposes the phosphates produced, or, rsther, that the basic affinities of the silica are quickly excited and set the phosphates at liberty.

All these conditions certainly have not equal iafluences, hut each seems to have its own.

In puddling we meet an energetic oxidizing actioa, produced as much hy the action of the peroxide of iron which constitutes the furnace lining ss by the peroxidizsd slag under the influence of free oxygen contained in the products of comhustion. The air entering at the doors is nnother cause of oxidation which we must not forget. The hasic state of the slag is not doubted, since the hed of the furnace is entirely covered with oxide of iron, and as the slag *en presence* contains commonly 10% to 12% of silica, and rsrely more than 20%. As to the liquation, it is chsracteristic of this operation; there hss heeu, perhsps, an exaggerated importsnce attached to this portion of the process in explsining the elimination of phosphorus; some one has even gone eo far as to say that wrought iron formiug (or "coming to nature") in the midst of a phosphoric slag is like ice, free from eslt, heing formed by the freezing of sea water. The temperature in puddliag is relatively low; moreover, it has heen found in the treatment of certain iron, very high in phosphorus, that it was important, in order to obtsin a good purification, not to have the heat too intense. We see, then, thst in puddling, all the conditions more or less known as necessary to dephosphorization are to a great measure fulfilled, and make of this process an energetic method of purification.

The Heaton Process.

In the Heaton process what do we find? The oxidizing action, although of short duration (it lasts only from two to five minutes), has here an intensity péculiar to this process; it is an explosive, instsntaneous action, utiliziag the oxygen ss eoon as it is free, or feebly combined with nitrogen in essily dissociahle products. The slag is hasic, for it contains a minimum of 30% of soda, which has powerful affinities, and 10% or 20% of oxide of iron; it also contains sometimes 54% of silica. The product was pasty and only half fluid; there was a kind of liquation, which did not show itself in any way except when the spongy metal, filled with slag, was reheated and hammered. Finally, the temperature is relatively low, and certainly would not psrmit the phosphate products being decomposed either by the heat alone or hy the exaltation of the basic affinities of the silica. This is certainly a group of favorable conditions.

It will not he the same if we consider the Bessemer operation. Althongh the oxidizing action is of an extraordinary intensity, the slags are very silicious, containing from 40% to 50% of silica, which is derived as much from the silica of the metal as from the lining, essentially silicious, of the converter. As to the temperature, it is excessively high, and we can ressonably believe, as regards this portion of the process, that it is sufficient to prevent all stable combinations of the phosphoric acid with the slag. These conditions certainly do not constitute a satisfactory *ensemble* when dephosphorization alone is considered, and we can scarcely be astonished that the purification amounts to nothing in either one or tbe other of these processes for the manufacture of steel. One can even go further, aud say that

The Most Prominent Metallurgists had Lost Hope

Of applying to steel any method of dephosphorization. In prssaues of theso difficulties, that neither the chemist nor ths empiricist seemed able to surmonat, we had tsken up with iuterest a solution wbich permitted leaving iu the stcel a praportion of phosphorus five or six times greater than what had beaa thought possible before tbis.

M. Euverte explsined, seme years ago, how, thanks to the employment of ferro-maugaaese, a reducing ageat mere cencentrnted nnd euergetic than spiegel, tho final oxidation of the metallic bath in the Bessemer aud Martiu-Siemens processes, could be raissd witheut iatroduciag into the steel so large n quantity of carben. He showed, alse, how the dimiaution of carbon permitted leaviag in the steel three or four thousandths of phosphorus without injnriing the praduct sufficieutly to prevent its beiug used for rsils. This was a vast field opened to the employment of iron rsils, for their conversioa in the Msrtin-Siemens furnace into steel rails of a good quality, eoutaining phosphorus; but it wae net the dephespherizatiou of impure pig metal.

SCIENTIFIC PROGRESS.

THE THERMOPILE.—Among the reccat iaveations by Mr. Edison, who, it eeems, ie not altogether absorbed in his electrio light experiments, is that of what he calls the thermopile, desigaed for tho measurement of iafiaitesimal degrees of heat. He describes the instrumont in the followiag words: "It consists of a carbon button placed between two metallic plates. A current of electricity is passsd through one plate, then through the carbou aad through the other plate. A piece of hard rubber or of gelatine is so supported as to press sgainst these plates. The whole is then placed in coancction with a galvanometer and an electric battery. Heat causes the etrip of hard rubber to expand and press the plates closer together an the carbon, allows more current to pass through and deflects the needle of the galvanometer. Cold decreases the pressure. Moisture near the etrip of gelatine can be measured in the same way hy increasing or decreasing the pressure, aad accordingly deflecting the needle. By means of this apparatus, or one combined with sensitive electrical galvanometers, it is possible to measure the millioneth part of a degree Fahrenheit. Infinitesimal changes in the moisture of the atmosphere csn he indicated in the same way—changes which are a hundred thousand times less in quantity than those that can be indicated hy the present harometer. It will thus foretell a storm much more readily. The carbon hutton I have in this instrument is of lampblack burned from rigolene."

CHLORIDE OF METHYL.—M. Camille Vincent has proposed, and advanced to successful experiment, a new process for extracting essential oils hy the use of chloride of methyl. The process is bssed upon the property of that suhstance to dissolve fats, rosins and essential oils. The first experiments eucceeded so far as the extrsction went, hut the product ohtained had a disagreeahle odor, caused by the presence in the commercial chloride of methyl of traces of some impurity. This impurity he succeeded in eliminating hy treating gaseous chloride of methyl with concentrated sulphuric acid. He extracts the perfume from flowers in the following way: They are digested for two minutes with successive charges of chloride, repeating the operation a number of times. Finally, the digesting vessels are exhausted, and the chloride, which carries with it the volatile esseatisl oil, is obtained in a gaseous state. This mixture is condensed, and the resulting liquid is heated to 86° Fahr. in a vessel from which the chloride of methyl is exhausted hy means of a vacuum pump. The chloride is thus separated from the perfume, which is contaminated hy fatty and resinous matter. The latter ie extracted hy meaas of alcohol.

A NEW CHEMICAL PHOTOMETER.—Herr Eden, in a communication to the Vienna Academy of Sciences, gives the details of a new chemical photometer, which is hased upon the observation that chloride of mercury is very easily reduced to insoluble chloride in sunlight whenever it is mixed with organic substances. The sensitive solution he uses consists of two volumes of a solution of 40 grams of oxalate of ammonia in one liter of water, and one volume of a solution of 50 grams of sublimate in one liter of water. In sunlight turhidity is immediately produced, the action of the light being weaker as the solution is more dilute. Herr Eden has furnished tables for the corrections necessary to allow for the influence of increasing dilution and varying temperature on the quantity of the chloride of mercury separated hy the photochemical process of decomposition.

METEOROLOGICAL observations have now become so extended that evidence ie rapidly accumulating to enable us to determine positively the source of the cold, aerial waves which sweep across our country during the winter season. The indications are that we owe them to the great area of high harometer in northeastern Siheria, where the pressure sometimes exceeds 31·50 inches and the temperature falls as low as 76° below zero.

SHOEMAKERS' WAX TO ILLUSTRATE THE FLOW OF SOLIDS.—Our foreign exchaages notice the following curious experiment: Lsst ysar Sir William Thomson commenced a new snd curious experiment oa shoemakers' wnx as a viscous material. A lsrge circulnr cake of it, about 18 inches ncross and 3 inches thick, was made; this was put into a shallow cylindrical glass vessel, which was filled with water to keep the temperature from vsrying with any great degree of rapidity. Below the cake a number of corks wore put, and ea the top there were placed some lead bullets. The rosult has been tbat, ia a yesr, tho corks have floated np through the wax, and are comiag out at the top; the bullets have sunk down through the wax, and have come out at the bottom; and this, it is to be observed, hss goae on while the wax wss at all times in such a coadition as to be excessively brittle to auy force suddenly applied, such as a blow from a hammsr, ar such as would be occasioned were the cske of wax to he nllowed to fall oa a steae fleer. Mr. J. T. Bottomley has bsea also experimeating with the same material, and has constructed miaiature glaciere in wooden chsaels, which present all the pheaomena of flow seeu in real glacisrs.

PHOSPHORESCENT PHOTOGRAPHS.—Dr. Woodbury is the inveator of a simple aad effective method of producing phosphoresceat photographs. He exposes a plate costed with a mixture of dextriac, hoaey aad bichromate of potash under a negative, the result beiag that those portions which are exposed to the effect of the light through tbe transpsrent portions of the aegative hardea, while those which are protected from the light remain adhesive. The lines of the image, therefore, will retain any fiae powder which is dusted over it, while the lead portions will not retaia it. Dr. Woodbury uses as a phosphorescent powder, sulphite of lime, which, adheriag to the unchanged portions of the film, will produce a picture thst can hardly be distiaguished in daylight from an ordinary photogrsph, bscause the substsnco used is almost entirely white. In the dsrk, however, having boen exposed to sunlight or any etrong artificial light, a luminous picture will be produced which is said to be very striking.

A NEW FLUID FOR PRESERVING ORGANIC SUBSTANCES.—The Prussian government hss published the recipe of a fluid for preserving organio suhstaaces, discovered by Prof. Wickersheimer. The *Scientific American* states that Prof. Barbeck, at a recent meeting of the Philadelphia Academy of Sciences, described tbe wonderful effects of this fluid, which has the power of preserviag not slone the color and form, but also the elasticity of vegetable or animal tissues which may he prepared hy immersion or injectioa. The formula for the prepsration of the fluid is ae follows: In 3,000 grams of boiling water dissolve alum, 100 grams; common salt, 25 grame; ssltpeter, 12 grsms; carboaate of potash, 60 grams; arsenious acid, 10 grams, After cooling and filteriag, add to every 10 liters of the solution four litere of glycerine and one liter of methylic alcohol.

A TELEPHOTE.—A Chioago *Tribune's* Pittsburg special says: Application for a patent in connection with a telephone was forwarded hy a gentleman of this city. The clsim is its sbility to transmit physical wave force of light electrically, similar to the trsnsmission of sound hy telephone. It is claimed that when the new invention is simply perfeoted for practicsl uso, it will be possible for one of two persons conversing hy telephone to perceive distinctly at the same time the image of tho person with whom he is conversiag. Tbe practical utility of the invention will be more thoroughly apparent when it is stated that the inventor helieves he will he shle to transmit from point to point any written or printed documents, for instance, the entire side of a newspsper.

EXPERIMENTS UPON HUMAN HEAT.—Hirn has supplemented his hrilliant thermo-dynsmio experiments hy an application of his method to the human orgsnism, in order to ascertain its mechanical equivaleut. He finds that in the normal condition, while the heat of the body is increasing or decreasing, every 425 kilogrammeters (3,074.084 foot-pounds) of work costs or hrings to the organism a unit of heat. By comparing the heat which really appears or disappeare with that which ought to appear or disappear, we can study what is going on in our hodies, and how they are modified hy the conditions in which they are placed. The laws of mechanical physics may thns teach ue how and how much our organism differs from an ordinary machine.—*Comptes Rendus.*

A MAGNET CAPABLE OF LIFTING THREE TONS. Mr. C. Belly, of Indianapolis, has lately made an 800-pound electro-magnet. The two iron cores are four inches thick hy 30 inches long, and slide along a yoke 18 inches in length, so as to vary the distauce of the poles. The two coils around the two cores consist of eight layers of isolated No. 6 copper wire, and the terminals are so arranged that the electrical current may be sent in various ways. Pole extension for diamagnetism is provided, and the various experiments for which it is adapted are almost numherless. This magnet was made for Prof. Jahn, of one of the schools in Indianapolis.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 5.		Week Ending Feb. 12.		Week Ending Feb. 19.		Week Ending Feb. 26.	
Alpha	10	9	9½	9	9	7½	8½	7
Alta	4.60	3.90	5¼	4½	4.30	3.70	3.90	3.05
Andes	1	85c	95c	85c	90c	75c	90c	70c
Alps								
Argenta	1.20	90c	1.30	1	1.30	1	1.15	90c
Atlantic								
Aurora Tunnel								
Baltimore Con	11½	8½	11½	10½	11½	10⅝	12½	10½
Belcher	50c		50c	40c	40c	35c	25c	20c
Belmont	12½	9½	10⅝	9½	9⅝	8⅜	8⅜	7
Bent & Belcher	5½	4.40	4.80	4.20	4.55	3.55	4	2
Bullion	2½	2	2.15		2.20	2.05	2.05	
Bechtel	1.10	75c	1.20	75c	1	90c	1.05	90c
Belle Isle	12	8½	10½	9½	6½	8½	9½	8½
Bodie	2½	1.95	2.90	2½	2.80	2.40	2.45	2
Benton	11	10½	10½	9½	9	8½	10	8½
Bulwer								
Boyle	1	75c	90c	70c	80c	70c	80c	50c
Black Hawk	1½	1.10	1½	1	2	1.30	2.70	2½
Belvidere	90c	60c	80c	65c	70c	55c	60c	50c
Booker	1.60	1.15	1.20	1	1.05	75c	85c	60c
Caledonia	4	3½	4	3.45	3.90	3.43	3¾	3½
California	1.95	1.60	1.70	1.60	1½	1.60	1½	
Challenge	8¾	6½	8	6¾	6½	6	6	5
Chollar	8	7	7				7	6
Confidence	75c	60c	65c	60c	65c	60c	65c	50c
Con Imperial	4.05	3.45	3.85	3.45	3.85	3¼	3¾	3¼
Con Virginia	5½	3.40	5¼	4.40	4.85	4.40	4.70	3.85
Crown Point	25c		35c	25c	30c	25c	30c	25c
Con Washoe	75c	35c	75c	50c	55c	50c	55c	50c
Champion			50c					
Concordia								
Dayton								
DeFrees								
Dancy			40c	35c	35c			
Day	70c	50c	60c	55c	60c	50c	60c	45c
Eureka Con	16	14	16¼		16½	15	14½	14
Exchequer	3.15	2.65	3.85	2.60	3.40	2.90	3	2.65
Enterprise	40c		40c		35c	30c	25c	15c
Gen Thomas								
Grand Prize	1½	1.30	1.35	1.30	1.30	1½	1.35	1½
Gila	10c	5c	5c					
Golden Chariot								
Golden Terra	10½		15	14				
Goodshaw	45c	35c	45c	30c	40c	35c	30c	25c
Gould & Curry	5¾	4½	6	5¾	5¾	5¾	5⅜	4½
Hale & Norcross	7¾	5¾	6¾	6¾	7	5¾	6¾	5¾
Hillside	1½	1.45	1	60c	1½	1	1.10	1
Highbridge								
Homestake								
Hussey								
Independence	1	90c	1	90c	1.30	1	1.20	85c
Julia	2.30	1.80	2.05	1½	1½	1.55	1.60	1½
Justice	2½	2	2.40	1.65	1.80	1½	1.60	1.15
Jackson				3		2.90	2	
Joe Bates								
K K Con	4				4		5¼	4
Kentuck	4		3½	3.90	3.60	3¾	3	3¼
Kossuth				15c		15c		15c
Keystone								
Lady Bryan	55c	40c	45c	40c	45c	25c	50c	30c
Lady Wash	95c	75c	1.05	80c	85c	70c	70c	55c
Leopard	20c	15c	20c	15c	20c	15c	15c	
Leviathan	30c	25c	35c	30c	30c	20c	20c	15c
Leeds	40c	35c	40c	35c	50c	30c	50c	
Lee								
May Belle	25c	20c	30c	25c	20c		20c	
Modoc	35c		35c		45c	40c	45c	40c
Manhattan	1.60		1.70	1.60	1½	1½	1¼	1.40
Martin White	1	80c	1	80c	1	80c	90c	80c
McClinton	65c	50c	60c	40c	50c	40c	50c	35c
Meadow Valley								
Mexican	18½	14½	17½	14½	18	15½	15½	12½
Midas								
Morning Star								
North Con Virginia								
New York	45c	35c	50c	40c	45c	35c	40c	30c
Northern Belle	12½	10½	16½	13½	17	14½	16½	13
New Coso								
Navajo	35c	30c	40c	30c	35c	20c	30c	25c
Occidental	1½	1½	1½	1	1.35	1	1.30	1
Ophir	18¾	16	17½	16	20	16½	17½	14½
Oriental	55c	55c	50c	45c	50c	30c	35c	30c
Overman	7¾	6	7¾	6¾	6¾	5¾	6¾	5¼
Panther								
Phenix								
Phil Sheridan			20c			20c		15c
Potosi	5	4	4.65	4.10	4½	3.60	3.70	2
Prospect								
Raymond & Ely	85c	75c	85c	70c	80c	70c	80c	60c
Richer								
Rock Island								
Rye Patch								
Rough & Ready								
Savage	7¼	5¾	6¾	5¾	6	5¼	5½	4½
Seg Belcher	22	21½	18				19	15
Sierra Nevada	22⅜	18	25	20⅜	23½	21	22½	20⅜
Silver Hill	1.45	55c	1.65	1½	1.35	1	1.05	80c
Silver King	6½	6¼	7		7¼	7	7	
Silver Prize								
Succor								
Summit	1.20	1	1.20	1	1.10	1	1.10	1
Scorpion	3.30	3	3.30	2.90	3½	3	3.05	2.80
Solid Silver	40c	35c	40c	30c	35c	30c	5c	
South Bodie	70c	30c	60c	40c	70c	50c	70c	65c
South Standard	25c		25c	15c	30c	25c	30c	25c
Star	30c	25c	25c	15c	25c		20c	
St. Louis	10c	5c	25c	20c				
Syndicate	1½	1.60	1.70	1.60	1.55	1.40	1½	1½
Tioga Con	3	2.70	3½	3	3.10	2½	2.80	2½
Tiptop	4½	4	4.40	4	4.10	4.05	4.55	4½
Trojan	30c	25c	30c	25c	40c	25c	35c	15c
Union Con	43½	36½	37½	33	35½	34	33½	30
Utah	15½	12	14	12½	13½	12	11½	10½
Vermont Con								
Ward	1.90	1.60	1.60		1.65	1.50	1.60	
Wells-Fargo	15c	10c	10c	5c	5c		5c	
Woodville								
White Cloud								
Yellow Jacket	11½	9	10	9	9½	8½	8½	6¾

Sales at S. F. Stock Exchange.

Friday A. M., Feb. 20.

70 Alta.....3.90
40 Alpha.....7¼
190 Andes.....90@85c
195 Benton.....2⅜@2.45
120 Bullion.....3.80@3.85
2375 Belcher.....11½@11.30
5 Confidence.....7
250 Bechtel.....2.05@2
65 California.....3¼@3.45
395 Con Imperial.....60@65c
435 Crown Point.....4.70
100 Con Virginia.....3.60@3.65
70 Challenge.....10½
370 Caledonia.....75c@80c
420 O Dorado.....1.65
110 Chollar.....6½
100 Essex.....1½
250 Fairfax.....75c
130 Gould & Curry.....5⅝
150 Golden Gate.....2
165 Hale & Nor.....6¾@6¾
55 Julia.....1.60@1.55
130 Justice.....1.60@1.55
55 Kentuck.....33
200 Leviathan.....20c
250 L Bryan.....30c
430 Lady Wash.....70@65c
405 Mexican.....15½@15
390 Mackey.....15c
200 N Bonanza.....45c
300 Ophir.....16¾
5 Occidental.....1
100 Phil Sheridan.....15c
190 Potosi.....3.70@3.60
170 Sierra Nevada.....22
145 Scorpion.....3@3.05
20 Seg Belcher.....19
255 Silver Hill.....1.60@1.65
170 Savage.....5¼
130 Trojan.....35c
60 Union Con.....33¾
50 Ward.....1.60
1000 Wells-Fargo.....5c
300 Yellow Jacket.....8½@8¼

AFTERNOON SESSION.

540 Albion.....35@20c
450 Argenta.....1.15@1½
550 Addenda.....60c
150 Booker.....60c
435 Belvidere.....2½@2.20
600 Belle Isle.....1
30 Bulwer.....8¼
70 Bodie.....9½
30 Black Hawk.....2
250 Bechtel.....2.05@2
1300 Champion.....50@55c
50 Day.....55c
800 Eureka Con.....14½@14¾
625 E M Diablo.....2@1.90
205 Grand Prize.....1.35
100 Goodshaw.....30c
100 Hillside.....1.10
250 Jupiter.....1½@1.20
500 Leopard.....15c
25 Leeds.....50c
100 Mono.....81@8¾
150 May Belle.....20c
50 M White.....90c
110 Metallic.....2
200 McClinton.....50c
120 Modoc.....45c
475 Mt Potosi.....3¼
160 Mammoth.....2@2.10
100 N Noonday.....2½
150 Navajo.....25@30c
700 N Belle Is.....20c
55 Northern Belle.....16¾
300 Oriental.....30c
250 Oro.....7½
725 Orient.....7¢@8c
200 Real del Monte.....2½
300 Raymond & E...75@80c
350 S Bulwer.....1¼
50 Silver King.....7
955 S Standard.....25@30c
160 S Bodie.....55c@50c
100 S Nooday.....1.80
35 Syndicate.....1½@1.40
155 Summit.....1
100 Tiptop.....4.55
500 University.....15c
20 Wales.....3

Saturday A. M., Feb. 21.

150 Alta.....3.70@3.65
150 Andes.....75c
2260 Argenta.....1.15@1.05
320 Best & Belcher.....8¾@8¾
395 Belcher.....10⅝@10½
375 Bullion.....3.60@3.70
25 Bodie.....2
225 Bechtel.....2
105 Benton.....2¼@2.15
100 Boston.....1.30
50 Black Hawk.....50c
50 Booker.....60c
40 Bulwer.....10
260 Belle Isle.....1.05@1
1060 Belvidere.....2.20@2⅜
150 Champion.....55c@50c
120 Con Dorado.....1½
485 California.....3.45@3.50
270 Crown Point.....4.30@4¼
50 Con Imperial.....55c
115 Caledonia.....75c@70c
345 Chollar.....51@55c
35 C Pacific.....4
100 Con Virginia.....3.70@3¾
200 Day.....60c
100 Dudley.....45c
50 Essex.....1½
365 Exchequer.....3
25 Eureka Con.....14½
50 Enterprise.....20c
125 E M Diablo.....1½@1.90
200 Flowery.....15c
160 Golden Gate.....2.55
260 Grand Prize.....1.35
425 Gould & Curry.....5⅝
50 Goodshaw.....30c
110 H & Norcross.....6¾
30 Hillside.....1
170 Justice.....1½@1.45
100 Jackson.....1
200 Julia.....1.55@1½
65 K K Con.....4
100 Kossuth.....15c
105 Kentuck.....32
900 Leopard.....15c
100 Lady Bryan.....30c
130 Mexican.....14½@14¾
50 Metallic.....1.95
100 Manhattan.....1½
200 Mt Diablo.....22½
200 Mt Potosi.....3.15
165 Mono.....81@83c
100 Mackey.....15c
100 May Belle.....20c
100 Mammoth.....2.10
100 McClinton.....40c
310 Northern Belle.....16
550 N Bonanza.....45@50c
130 Ophir.....16¾@16¾
220 Overman.....6@5¾
700 Orient.....70c
500 Oro.....2@2¼
780 Potosi.....2@2¼
350 Quincy Bee.....25c
130 Real del Monte.....1½
190 Raymond & E.....75@70c
20 Summit.....1
300 S Bulwer.....1.45@1¼
50 Scorpion.....3.05
100 S Standard.....25c
235 Sierra Nevada.....21@20½
40 Silver King.....7
620 Tiptop.....4.55@4.35
550 Trojan.....30@25c
245 Union Con.....31¼@32
20 Utah.....11¼
100 University.....15c
180 Wales.....2
400 Yellow Jacket.....8¼@7¾

Tuesday A. M., Feb. 24.

300 Andes.....85c
200 Alta.....3½
50 Alpha.....7
960 Belcher.....10½@10
265 Best & Belcher.....3¼@3.10
240 Bullion.....3¼@3.10
305 Benton.....2
250 California.....3¼@3¼
140 Con Virginia...3.60@3.55
395 Chollar.....5¢@5¼
125 Con Imperial.....55c
10 Challenge.....1½
415 Caledonia.....60c
170 Con Imperial.....55c
895 Crown Point.....4@3.85
435 Exchequer.....2¼@2.30
630 Golden Gate.....2¼@2
655 Gould & Curry.....4½@4¼
220 H & Norcross.....6¾@5¾
355 Julia.....1½@1.45
1100 Justice.....1½@1.05
100 Kossuth.....15c
60 Lady Bryan.....30@35c
150 Mackey.....20@15c
910 Mexican.....12½@12¾
390 N Bonanza.....45c
680 New York.....35@35c
620 Ophir.....15¾@15¾
120 Overman.....5¾@5¾
200 Potosi.....2.90@2.80
220 Savage.....4½@4¾
135 Scorpion.....3@2.80
625 Silver Hill.....80@85c
15 Seg Belcher.....15
230 Sierra Nevada.....20½@20⅜
400 Trojan.....25@15c
385 Union Con.....30¼@30
145 Utah.....10½
1050 Ward.....1.60@1.65
275 Yellow Jacket.....7@6¾

AFTERNOON SESSION.

300 Albion.....30c
1025 Argenta.....1.05@1.10
600 Atlas.....
600 Andes.....50c
50 Boston.....1.30
125 Booker.....60@50c
600 Belvidere.....2.70@2
545 Belle Isle.....
175 Bullion.....85@3
5 Bodie.....8½
160 Belmont.....20c
500 Bechtel.....2
600 Champion.....50c
20 C Pacific.....4

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Feb. 19.

60 Alpha.....7¾
235 Alta.....3.70@3.90
350 Andes.....30@30c
30 Best & Belcher.....9
915 Belcher.....10⅝@10¾
325 Bullion.....3.90@3.80
320 Benton.....2.40@2.45
770 California.....3.45@3½
1840 Con Virginia.....3.85
70 Chollar.....6
400 Crown Point...4.40@4.45
1310 Con Imperial.....60c
60 Confidence.....7
450 Caledonia.....3¾
390 Con Dorado.....1.65
320 Exchequer.....3@2.90
50 Essex.....1½
160 Flowery.....20@10c
500 Fairfax.....75c
90 Gould & Curry.....5¾
230 Golden Gate.....2.55@2¼
50 Hale & Nor.....6⅝@6¾
360 Justice.....1½@1.55
90 Julia.....1.60
50 Kentuck.....35c
1000 Lady Wash.....75@70c
400 Leviathan.....20c
420 Mexican.....15½@15¾
150 Mackey.....20c
200 New York.....35c
130 N Bonanza.....45c
325 Ophir.....16¾@16¾
35 Overman.....6@5¾
50 Occidental.....1.05
125 Potosi.....3.70@3¾
100 Savage.....4¼
270 Sierra Nevada.....21½
300 Silver Hill.....1.05@1.10
100 Scorpion.....3.05
100 Dudley.....50c
550 Day.....45c
135 Eureka Con.....14½@13
1300 Endowment.....20c
270 E M Diablo.....1½
175 Goodshaw.....30c
630 Grand Prize.....1!@1.30
180 Independence.....1.20
170 Jupiter.....1½@1.60
550 Jackson.....2
2050 Leopard.....15c
100 Martin White.....90c
460 Mammoth.....2@1.95
100 Mono.....3
1050 May Belle.....20c
300 McClinton.....40c
100 Mt Potosi.....3½
700 Orient.....60@55c
400 N Noonday.....3
200 Oro.....4@3¾
115 Syndicate.....1.40
120 Summit.....1.05
600 S Bulwer.....1.60@1.55
250 S Bodie.....55c
430 Tiptop.....4.55
310 Tioga.....2.80@2.70
200 University.....15c

Wed'sday A. M., Feb. 25.

130 Alta.....3.05@3.10
70 Alpha.....7¼
155 Andes.....75@80c
250 O Dorado.....1½
150 Essex.....1½
55 Exchequer.....2.65@2.80
100 Flowery.....15c
230 Gould & Curry...4.60@4¾
200 Golden Gate.....
130 Hale & Nor.....6
545 Julia.....1¼@1.30
620 Justice.....1.15@1.20
100 Kossuth.....15c
100 Kentuck.....3
345 Lady Wash.....55@50c
350 L Bryan.....35@40c
50 Leviathan.....20c
100 Mackey.....15c
165 Mexican.....13¾@13¾
335 N Bonanza.....30@40c
300 New York.....30c
275 Ophir.....16¼@15¾
95 Overman.....5¾@5¾
220 Potosi.....3.10
230 Savage.....5¢@4¾
30 Seg Belcher.....15
200 Scorpion.....2.90
395 Silver Hill.....80c
370 Sierra Nevada...21½@22½
100 Trojan.....20c
180 Utah.....10¼@10¾
200 Union Con.....31¾@32
1000 Wells-Fargo.....5c
515 Yellow Jacket.....7¼@7½

AFTERNOON SESSION.

1130 Argenta.....90c@1
200 Addenda.....60@55c
100 Alpha.....20c
270 Boston.....1½
200 Belmont.....25c
75 Bulwer.....9
155 Bodie.....8¼@8½
250 Bechtel.....2
300 Black Hawk.....75@70c
185 Belle Isle.....90c
350 Belvidere.....2½
500 Champion.....50c
105 C Pacific.....4@3.90
1000 Wells-Fargo.....5c
515 Yellow Jacket.....7¼@7½

AFTERNOON SESSION.

1130 Argenta.....90c@1
200 Addenda.....60@55c
100 Alpha.....20c
270 Boston.....1½
200 Belmont.....25c
75 Bulwer.....9
155 Bodie.....8¼@8½
250 Bechtel.....2
300 Black Hawk.....75@70c
185 Belle Isle.....90c
350 Belvidere.....2½
500 Champion.....50c
105 C Pacific.....4@3.90
270 E M Diablo.....1¼@1
180 Eureka Con.....13
350 Endowment.....20c
235 Grand Prize.....1½@1.30
350 Goodshaw.....30@25c
80 Inapendeuce.....85c@1
50 Jackson.....2
370 Jupiter.....1.70@1.90
145 K K Con.....5
250 Leopard.....15c
100 Manhattan.....1.40
225 Martin White...90c@80c
75 Mammoth.....1½@1.80
100 Mono.....71@7
255 McClinton.....40@50c
100 Modoc.....45c
75 May Belle.....20c
250 Mt Potosi.....3½
30 Mt Diablo.....2½
250 N Belle Is.....20c
350 Northern Belle...15@15¾
80 Noonday.....4
20 N Noonday.....2½
980 Oro.....90@80c
550 Orient.....60@50c
600 Paradise.....50c
350 Raymond & E...60@75c
670 S Bulwer.....1.70@1.65
250 Star.....20c
35 Silver King.....7
700 S Noonday.....1½@.85
1330 South Standard..25@30c
540 Syndicate.....1¼@1.40
50 Summit.....1.10
300 Tioga Con.....2½
630 Tiptop.....4¼@4½

250 Solid Silver.....30@35c
350 Trojan.....35@40c
10 Utah.....12½@12
210 Union Con.....34¼@34½
2600 Wells-Fargo.....5c
200 Ward.....1.65
680 Yellow Jacket.....8¼@8¼

AFTERNOON SESSION.

550 Atlas.....10c
400 Albion.....35c
670 Argenta.....1.10@1
810 Addenda.....60c
100 Belle Isle.....1
480 Belvidere.....2.20
425 Black Hawk.....45@50c
100 Bulwer.....8½
200 Bodie.....8¾@8½
475 Bechtel.....2.20@2.15
140 Boston.....1.40@1¼
30 C Pacific.....4
1300 Champion.....50@55c
150 Day.....55@60c
30 Dudley.....45c
20 Eureka Con.....15
150 Endowment.....30@25c
600 E M Diablo.....1.85@1¾
100 Grand Prize.....1.40
100 Independence.....1½
200 Jackson.....2
150 K K Con.....5
50 Martin White.....90c
50 Mt Diablo.....40c
150 Mt Potosi.....3¼
100 McClinton.....50@45c
75 Mono.....71@7
1400 N Belle Is.....20c
45 Northern Belle...16½@16
10 Noonday.....4
50 N Noonday.....2½
350 Orient.....60@55c
630 Oro.....70@65c
900 Oriental.....5¢
950 Paradise.....50c
420 Queen Bee.....25c
175 Raymond & Ely...75@80c
250 S Noonday.....1¼@1.30
100 Silver King.....7
1050 S Bulwer.....1½
140 S Bodie.....85c
450 S Standard.....25c
400 Summit.....1.05@1
350 Syndicate.....1½@1.40
5 Tioga Con.....2.80
200 Tiptop.....4.40
245 University.....15@20c
400 Wales.....3

110 Ophir.....15½@15¾
250 Silver Hill.....85c
20 Scorpion.....3
150 Savage.....4½
80 S Nevada.....2½
100 Union Con.....32½@32¾
10 Utah.....12
70 Yellow Jacket.....7¾

AFTERNOON SESSION.

500 Argenta.....95c@1
5 Alta.....3.20
20 Belvidere.....2.30
60 Best & Belcher.....3.25
100 Bullion.....3.20@3¼
60 Con Virginia.....3.60
10 Crown Point.....4.10

100 Con Imperial.....53c
50 Eureka Con.....13½
50 Exchequer.....2.90
50 Gould & Curry.....4.85
10 Hale & Nor.....6
50 Julia.....1½
50 Justice.....1.15
50 Mono.....7
100 New Coso.....30c
20 Ophir.....16
20 Potosi.....3.10
30 Savage.....4.50
260 Silver Hill.....80@85c
30 Utah.....10½@10¾
130 Yellow Jacket.....7¾@7½

MINING STOCKBROKERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Belcher S M Co	Nevada	21	1 00	Jan 29	Mar 3	Mar 25	J Crockett	203 Bush st
Belle Isle M Co	Nevada	1	30	Jan 27	Mar 3	Mar 25	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	17	1 00	Jan 29	Mar 4	Mar 24	W Willis	309 Montgomery st
Bodie Tunnel & M Co	California	4	20	Feb 3	Mar 21	Apr 28	A F Main	309 California st
Bullion M Co	Nevada	13	50	Jan 26	Feb 28	Mar 17	J M Brazell	328 Montgomery
Caledonia S M Co	Nevada	30	50	Jan 31	Mar 6	Mar 26	R Wegener	414 California st
Champion M Co	California	—	05	Jan 29	Mar 1	Apr 1	C O Hurlbut	525 Commercial st
Chollar M Co	Nevada	3	50	Feb 5	Mar 11	Mar 31	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	40	50	Jan 15	Feb 19	Mar 11	J Newlands	203 Bush st
Day M Co	California	7	25	Feb 4	Mar 8	Apr 5	E C Masten	309 Montgomery st
El Tesoro	California	8	26	Dec 15	Feb 28	Mar 20	W H Chickering	214 Sansome st
Europa M Co	Nevada	3	10	Dec 30	Feb 3	Mar 6	J L Fields	240 Montgomery st
Exchequer M Co	Nevada	15	50	Jan 13	Feb 17	Mar 9	C E Elliott	327 Pine st
Gila S M Co	Nevada	6	25	Jan 15	Feb 7	Mar 9	W W Parrish	328 Montgomery st
Gould & Curry S M Co	Nevada	37	1 00	Jan 6	Feb 11	Mar 4	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	63	1 00	Jan 14	Feb 19	Mar 11	J F Lightner	309 Montgomery st
Hillside M & M Co	Nevada	2	30	Feb 4	Mar 8	Apr 5	F Frankenthal	330 Pine st
Independence M Co	Nevada	5	30	Jan 13	Feb 17	Mar 9	E M Hall	327 Pine st
Indian Queen M Co	Nevada	3	15	Feb 11	Mar 20	Apr 12	G Adams	431 California st
Iowa M Co	Nevada	8	10	Jan 21	Feb 23	Mar 11	R L Thomas	411½ California st
Justice M Co	Nevada	31	50	Feb 9	Mar 15	Apr 5	A E Kelly	419 California st
Lady Bryan M Co	Nevada	4	50	Dec 27	Jan 30	Feb 28	——	203 Bush st
Leviathan M Co	Nevada	10	25	Feb 17	Mar 20	Apr 10	F A Frisius	330 Pine st
Mammoth M Co	California	4	1 00	Feb 13	Mar 26	Apr 21	A W Rose	302 Montgomery st
McClinton M Co	California	5	25	Feb 6	Mar 12	Apr 2	W H Lent	309 Montgomery st
Metallic M Co	——	2	25	Feb 9	Mar 15	Apr 5	——	309 Montgomery st
Mexican M Co	Nevada	10	2 00	Jan 10	Feb 13	Mar 4	C L McCoy	203 Bush st
Mountain View S M Co	Nevada	1	25	Dec 31	Feb 10	Feb 23	J Moore	309 California st
New York Mc Co	Nevada	21	5	Jan 26	Feb 28	Mar 20	D O Thomas	303 Bush st
North Belle Isle M Co	Nevada	2	15	Feb 5	Mar 10	Mar 31	E M Hall	327 Pine st
Potosi M Co	Nevada	3	50	Feb 5	Mar 11	Apr 1	W E Dean	203 Bush st
Raymond & Ely S M Co	Nevada	13	25	Jan 28	Mar 1	Mar 24	W L Elliott	328 Montgomery st
Savage M Co	Nevada	41	50	Feb 4	Mar 8	Mar 27	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	6	25	Jan 6	Feb 10	Mar 2	G R Sphiney	310 Pine st
Sierra Nevada S M Co	Nevada	61	3 00	Jan 6	Feb 11	Mar 3	W W Stetson	309 Montgomery st
South Bodie G M Co	California	2	10	Jan 16	Feb 18	Mar 10	——	309 Montgomery st
South Bulwer M Co	California	6	25	Jan 20	Feb 24	Mar 17	W Stuart	320 Sansome st
Telfair M Co	Arizona	2	02	Feb 5	Mar 13	Apr 3	J Pentecost	702 Market st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Ætna M Co	Arizona	1	05	Dec 23	Feb 13	Mar 6	J S Benear	420 Montgomery st
Albion M Co	——	1	10	Jan 15	Feb 27	Mar 26	——	7 Stock Exchange
Arizona Concentration Co	Arizona	1	10	Feb 5	Mar 17	Apr 6	O E Travers	402 Montgomery st
Arizonat and Wide West Grav M Co	Cal	2	25	Feb 2	Mar 2	Mar 22	Wm B Lake	204 Kearny st
Equator M Co	Nevada	2	45	Feb 16	Mar 22	Apr 12	W Willis	309 Montgomery st
Gover M & M Co	California	40	10	Dec 24	Feb 2	Mar 8	W O Wilson	402 Front st
Ivanpah M & M Co	California	1	10	Jan 19	Feb 23	Mar 11	E J Friedlander	309 California st
Jackson M Co	Nevada	11	1 00	Feb 10	Mar 16	Apr 5	O N Shaw	408 California st
Jupiter M Co	California	7	10	Jan 23	Feb 23	Mar 19	E O Mason	309 Montgomery st
Lady Emma G M Co	California	1	10	Jan 13	Feb 20	Mar 20	F R Bunker	606 Montgomery st
Leeds S M Co	Utah	1	10	Jan 17	Mar 3	Mar 31	——	7 Stock Exchange
Liberty Hill Cou M & Water Co	Cal	1	60	Dec 30	Jan 16	——	J W Pew	310 Pine st
Mayflower Grav M Co	California	7	10	Jan 19	Feb 23	Mar 16	J Morizio	328 Montgomery st
Phœnix		23	30	Jan 19	Feb 20	Mar 25	——	7 Stock Exchange
Rocky Point M Co	California	2	10	Jan 14	Feb 20	Mar 11	A C Taylor	314 Bush st
Tuscarora M & M Co	Nevada	6	15	Jan 24	Mar 1	Mar 22	M E Sperling	309 California st
University G M Co	California	5	10	Feb 10	Mar 26	Apr 15	W L Oliver	328 Montgomery st
Western M Co	Arizona	2	1 00	Jan 20	Mar 4	Mar 30	C S Curtis	203 Bush st
Wide Awake P & M Co	Arizona	9	03	Feb 11	Mar 15	Apr 3	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Ætna M Co	——	A F McGrew	420 Montgomery st	Annual	Mar 20
American M & Dredging Co	——	E Moreau	220 Sansome st	Stockholders	Mar 8
Butte Hydraulic M Co	California	L L Oennery	729 Montgomery st	Annual	Mar 8
Concordia M Co	Nevada	W J Taylor	310 Pine st	Annual	Mar 1
Esta Buena Con S M Co	——	R N Brooks	533 Kearny st	Special	Feb 21
Golden Chariot M Co	——	J T McGeoghegan	318 Pine st	Annual	Mar 1
Gold Deposit M Co	——	J M Buffington	309 California st	Annual	Mar 3
Hale & Norcross S M Co	Nevada	J F Lightner	309 Montgomery st	Annual	Mar 10
Northern King M & M Co	——	E A Holmes	318 Pine st	Special	Mar 13
Original Gold Hill G & S M Co	Nevada	J M Buffington	309 California st	Stockholders	Mar 6
Oro Blanco M Co	——	W O Gould	220 Sansome st	Annual	Mar 8
Rocky Point M Co	California	T L Bibbins	314 Bush st	Stockholders	Feb 28

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	F M Hall	327 Pine st	20	Feb 26
Black Bear G M Co	California	W L Oliver	Safe Deposit Bldg	25	Feb 16
Bodie Con M Co	California	W H Lent	Nevada Block	25	Mar 1
California M Co	Nevada	C P Gordon	Nevada Block	50	Dec 22
Con Virginia M Co	Nevada	A W Havens	Nevada Block	50	Dec 23
Eureka Con M Co	Nevada	P Jacobus	37 Nevada Block	30	Feb 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	30	Feb 24
Kenny Westerfield Co M Co	California	A Hasley	312 Montgomery st	25	Feb 3
New York Hill G M Co	——	J B Leighton	527 Clay st	25	Feb 20
Ophir S M Co	Nevada	C L McCoy	203 Bush st	1 00	Jan 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Feb 12

California Board—Latest Sales.

Wed'sday A.M., Feb. 25.

1200 Atlanta.....5@7c
70 Alta.....3.05
100 Argenta.....1
100 Benton.....2½
65 Belcher.....11¾@11½
10 Best & Belcher.....3¾
30 Bullion.....3.20
200 Curtiss.....80@75c
120 Caledonia.....75c
60 California.....3.45@3½
30 Confidence.....6
100 Central (B).....10c
20 Chollar.....53@56
175 Con Virginia.....3¾
110 Crown Point.....4.20
200 Enterprise.....15½
200 Exchequer.....2.80@2.75
50 Goodshaw.....31@30c
100 Golden Gate (B).....65c
30 Gould & Curry.....4¾
10 Hale & Nor.....6
120 Julia.....1¼@1.30
120 Justice.....1.15@1.17
10 Kentuck.....5
100 Kossuth.....14c
100 Lady Wash.....60c
100 Leviathan.....20c
30 Mexican.....13¾@13¾
100 N Sierra

Mining Share Market.

The legislative antagonism to stock transactions and mining operations has created a stagnation in the market, and the supreme dullness which exists is the result of such interference. There has been no stability in prices; fluctuations have been too slight to demand special notice; while the general tendency has been downward, and continues so to this date.

In contrast to our own market, we would call attention to the operations in the boards of the Eastern cities. Where sales are very brisk and rapidly increasing in volume. The restrictions which press so heavily here are unknown there, hence the marked difference in the market tone of the two sections of the Union. Some of our leading stock operators have already left for the New York field, and we learn that others are preparing to follow their example. With them goes their wealth and influence, and if this legira is continued it will dwindle the market down to the meager operations of only tho men of very small capital. At present there does not appear to exist either the cause or ability to start a first-class boom.

Mining Law Amendments.

The bill to amend Sections 2324 and 2325 of the Revised Statutes of tho United States, concerning mineral lands, has passed Congress and is now a law. It reads as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that Section 2325 of the Revised Statutes of tho United States be amended by adding thereto the following words: "Provided, that when the claimant for a patent is not a resident of the land district whereiu the vein, lode, ledge or deposit sought to be patented is located, the affidavits required to be made in this section by tho claimant for such patent may bo made by his, her or its authorized agent, when said agent is conversant with the facts sought to be established by said affidavits; and, provided that this section shall apply to all applications now pending for patents for mineral lands."

Sec. 2. That Section 2324 of the Revised Statutes of the United States be amended by adding the following words: "Provided, that the period within which the work required to be done annually on all patented mineral claims shall commence on the 1st day of January succeeding the date of such claim, and this section shall apply to all claims located since the 10th day of May, A. D. 1872."

Bullion Shipments.*

Since our last issue, we have noticed the following hullion shipments:

Ontario, Feh. 13, $3,923.15; Feb. 16, $8,562.99; Feh. 17, $4,348.33; Feh. 18, $4,055.17; Feb 19, $4,386,48; Feh. 20, $4,415.45; Feh. 21, $3,990.22; McCormick & Co., received Feh. 16, $18,941; Feh. 18, $11,977; Feb. 20, $20,107; Alexander, Feh. 9, $3,687.83; Feh. 11, $1,776.73; Feh. 13, $3,031.61; Richmond, Feh. 17, $16,429.42; Feh. 20, $16,516.35; Eureka Con., Feh. 22, one week, 242,145 lbs.; Christy, Feh. 16, $5,395; Feh. 18, $1,614.27; Paradise, Feh. 16, $3,664.23; Feh. 21, $3.694.81; Horn Silver, Feh. 13, $7,500; Feb. 18, $20,000; Feh. 19, $5,000; Wells, Fargo & Co., at Eureka, Feh. 19, $1,600; Feh. 21, $1,000; at Silver City, Idaho, Feh. 8, $10,671; Buffalo, Feh. 8, $28,797; Corbin, Feh. 14, $6,238.19; Leeds, Feh. 18, $5.995.12; Con. Virginia, Feh. 21, $64,690.60; Union Con., Feb. 21, $48,461.28; Ophir, Feh. 21, $141,533,67; Argenta, Feh. 23, $11,500.

*Desiring to make our list of Bullion Shipments as complete as possiblo, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

THE FOOD SHIP FROM AUSTRALIA.—At the departure of the last mail from Sydney there was lying at the dock a vessel chartered by the colonial government to carry to England, food preserved from decay by any process which claimed to leave it in a "fresh" condition. There had already been fitted up in the ship apartments for testing a refrigerating process. Visitors were shown meat in frozen condition, when it is as firm as wood, and there was also illustrated the effect of the refrigerating process on fruit, showing that oranges and apples could he frozen as firm as cricket halls. Artificial snow and frost were also produced. It was suggested that advantage should he taken of the departure of the *Strathleven* with her freezing apparatus to ship other products besides beef for the English market. The experiment of sending butter to England failed when tried before, because the article was spoiled on the voyage; hut it was thought that it could he safely sent if kept at feezing heat—so to speak. The results attained by this experimental cargo will he looked for with interest.

THE President has nominated Rowland E. Trowbridge, of Michigan, to be Commissioner of Indian Affairs.

PLIMSOLL has apologized to the British House of Commons for the language contained in his recent handhill.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MONTERICHARD.—*Dispatch*, Feb. 21: Everything about tho mine is looking well, and a new drift will bo started in the 450 level.

NEW STRIKE.—Messrs. Wilson & Kittridge have discovered a new ledge about a milo below the Monterichard. It is a well defined ledge, three ft wide, and has been traced about 400 ft, the vein running north and south.

BUTTE BANK.—It is reported that a bed of very rich gravel has been struck in this mine. We are glad to be able to record this streak of good luck on the part of the proprietors.

ITEMS.—Tho Kelly claim and tunnel near Murphy's gulch is being worked once again. W. H. Kruger is developing his claim with the view of getting a patent on it, when capital will be forthcoming with which to thoroughly develop it. Mr. James Morgan has negotiated for the claims of Mrs. Holtz and Mr. Paul, in Murphy's gulch, and will soon commence work upon them. Mr. I. N. Dewitt is moving all of Murphy's ridge that he can get away with, and if report speaks true, he is doing well by the operations.

YELLOW JACKET.—The Yellow Jacket company, on Dry creek, are sinking on a very fine looking ledge, which is fully as wide as the shaft, and prospects very encouragingly. This mine adjoins the Crown Point on the south.

ASBESTOS.—*Ledger*, Feb. 21: Some two years ago we mentioned the discovery of an asbestos deposit on Stony creek, four miles west of Jackson, by S. V. Carter. The property is now held by Boon Bros., lately settled in that vicinity. They are opening up the claim gradually, working on it at intervals. They inform us that the asbestos is improving in quality as they get deeper.

NEWTON COPPER.—At the Newton copper mine, a lively aspect prevails than has been seen for years past. There is a strong force at work, both above and below the surface.

ITEMS.—Nothing is doing at the Talisman, except keeping down the water. The Original Amador is running a reduced force of men. The Oover mill is idle, and a small force of miners is employed in the mine prospecting.

BUTTE.

FEATHER RIVER.—*Record:* This stream in early days yielded an immense amount of gold, hut for several years past the water has been diverted from its bed so that not enough was left to run the necessary pumping machinery and do the washing, but within the past two years the hurdy-gurdy wheel has been brought to the aid of the miners, and by purchase of a few inches of water from the Feather river and Ophir ditch, the claims can bo drained at less exponse and work commenced much earlier in the season than when the whole volume of water was in the river.

CALAVERAS.

GWIN.—*Advertiser*, Feb. 10: Everything at the mine is progressing to its fullest capacity, a large number of operatives being employed. The rock now being taken from the north shaft is steadily improving in quality, and that taken from the 500 level, south shaft, is rich in sulphurets and free gold. At a distance of 180 ft from the shaft a 12-ft wide lode is developed, and the indications are that to the south lies a bonanza.

MARIN.

SAN RAFAEL.—*Journal*, Feh. 10: The tunnel will strike the ledge at 160 ft in the hill. A shaft will bo sunk on the ledge to the tunnel, 254 ft below the surface. A tramway will be built from the top of the shaft to the mouth of the tunnel, to carry what is taken out in sinking tho shaft. The mill site is about 400 ft from the mouth of the tunnel. The mill is building by a separate company in San Francisco, under a contract. The tunnel is in 122 ft, in black spar, with indications that the ledge is close at hand. About 700 ft of 3-inch water pipe have been laid to connect a spring with the buildings. It is the intention of the company never to list the stock. They are satisfied with what they have in the mine.

MARIPOSA.

RIVER TUNNEL AND MINE.—*Gazette*, Feb. 21: There are two levels, the 400 and the 500. At the 400 the vein is developing, some eight or ten ft wide and is increasing as the work progresses. About two ft of the vein lying against one of its walls is very rich and estimated to be worth from $200 to $300 per ton, while the average of the whole vein is estimated at $30.

SILVER AND GOLD.—Recent developments made at the silver mine about five miles southeast of this place, near L. A. Munroe's ranch, is exciting considerable interest. Some few months ago parties commenced prospecting the vein (which was known for many years to contain silver, but supposed to be quito limited), and now find the rock contains silver and gold in nearly equal proportions.

MONO.

BELVIDERE.—*Free Press*, Feh. 21: This mine is situated on the southern slope of High peak, its northern end reaching nearly the top of that eminence, while its southern extremity extends to the sag which divides High peak from Silver hill. It is sandwiched between the Bulwer Con. on the east and the Con. Pacific on the west; is 1,500 ft in length and of varying width, from 200 to 320 ft. The working shaft is situated 1,000 ft south of the north line, and 500 ft south of the old works. It is a double compartment, and is down 400 ft. A level was run at 300 ft in which a rich body of ore was cut 170 ft from the surface. Fifteen ft below this level the ledge appeared in the shaft, and continued until witbin 20 ft of the bottom, where it pitched out to the east, coming in again at the 400-ft station.

BULWER CON.—The north drift on tho Ralston ledge is in 60 ft. The ledge is three ft wide, of good ore. The south drift is in from the tunnel 69 ft. The ledge is three ft wide and looking well. The north drift on the Stonewall ledge has a total length of 07 ft, showing a ledge in the face 18 inches wido, of very good ore. The south drift is in 63 ft. The ledge is two ft wide, of good ore. The stopes on the Ralston ledge are looking well. The ledge is three and one-half ft wide, of high-grade ore.

STANDARD CON.—The main shaft is down 704 ft. The rock in the bottom continues very hard. The crosscuts, 700 level, are making the usual progress. The north drift from the east crosscut, 500 level, is in 40 ft. The ledge is two ft wide, of good ore. The south drift, 385 lovel, is now in 355 ft from the crosscut. The ledge is about two and one-half ft wido, of good ore. The upraise on the Cook ledge is four and one-half ft wide, and looks well. The north drift on the east ledge 300 level, incline, is in 160 ft, showing a ledge two and one-half ft wido, of good ore. The south drift from the west crosscut is in 184 ft. The ledge in this drift is three ft wide, of rich ore. An upraise is above this drift 24 ft, where the ledge is three ft wide, of good ore. The drift, 550 level, is in 280 ft; the ore is of a good quality, and is four ft wide. In the stopes, north drift, 385 level, the ledge is 25 ft wide. In the West Standard stopes the ledge is four and one-half ft wide, and is looking well. In the stopes on the Gildea vein the ledge is three and one-half ft wide, and looking well.

CON. PACIFIC.—The main shaft is sunk to the 500 level, where a station is being cut out. The formation at the 500 level is of a most favorable character, and more easily mined than on the 400 level. Work on the 400 level is going forward as usual; running main drifts north and south, preparing to crosscut the veins both to the east and west of the line of these drifts. The north drift is in 133 ft, and the south drift 122 ft from the 400 station.

SUMMIT.—The north drift, 530 level, has a total length of 94 ft. The ledge is two ft wide. The south drift has a total length of 101 ft. The rock in both drifts is pretty hard.

DOUBLE STANDARD.—The north drift has a total length of 33 ft. The rock in this drift is very hard. The south drift is in 145 ft.

SILVER HILL.—The tunnel is now in from the west entrance a total distance of 520 ft, and from the Ore main shaft west 171 ft, and east 188 ft.

HARRINGTON.—The winze is down 82 ft. The three-ft vein in the southeastern inclination has passed to the east side of the winze; bird's-eye porphyry in the bottom, with favorable indications that the porphyritic syenite, which forms the hanging wall of the La Grange ledge, will soon be reached. This ledge, as explored by the tunnel, yields assays from a trace to $26 gold. The winze was connected perpendicularly from the level of the tunnel at a point calculated to strike the main ledge at a depth of about 120 ft.

UNIVERSITY.—The shaft is down 341 ft. The ground is softer, and is filled with seams of clay and quartz. The shaft will be continued to a depth of 500 ft before crosscutting, when exploring drifts will be run east and west to intersect the ledges opened up at a depth of 328 ft in the old works. This shaft is one of the most substantial in the camp, being a triple-compartment four ft three inches by four ft three inches in the clear in each compartment, timbered with eight by eight square sets.

TIOGA.—The main shaft is down 785 ft. The rock continues very hard, standing vertical. The stringers of silver-bearing ore continue to improve as depth is attained. Syndicate drift is in 087 ft. The face of the drift still in hard ground. East crosscut from Ralston winze, 020 level, is in favorable vein matter. The upraise, on vein No. 3, has now reached 121 ft, incline measurement.

QUEEN BEE.—Bodie *News*, Feb. 21: The north drift from the east crosscut, 400 level, is in a total distance of 25 ft. The face is in ledge matter of a very favorable character, with frequent bunches of rich ore scattered through the ledge. At a point 85 ft north of the main east crosscut, a cross drift was run to the footwall, a distance of 10 ft; a small seam of good-milling ore two ft wide was found on the clay selvage of the footwall.

SOUTH NOONDAY.—The shaft is down 153 ft. It is expected the Sand Bank ledge will be cut at the depth of 225 ft. The shaft will be continued to the 250 level, when a station will be cut out and crosscuts run to the ledges.

NEVADA.

MONICAN.—*Transcript*, Feb. 24: A crushing of 42 tons of ore yielded in free gold $1,000.18, besides four tons of sulphurets assaying $33.05 a ton. The average yield per ton was therefore about $30. Most of the ore was taken out in sinking the shaft, which is 140 ft deep, and from the 120 ft east drift. There are sixty tons of the same character yet on the dump. The first crushing paid $12.50 a ton; the second, $14.57; and as wo have shown above, the last about $30.

EL CAPITAN.—*Transcript*, Feb. 19: The permanency or richness of the property cannot be determined without sinking 100 ft below the present depth of 150 ft. The walls are now 50 ft apart. Two promising chutes of ore exist on the 150 level.

COE.—It is situated on the Red Dog road, near Nevada City. From 50 to 60 tons of ore has been produced, 33 tons of it paying $34 per ton, and the remainder $20.

HIRSCHMAN.—Nevada *City Herald*, Feb. 17: Is working day and night, and uses 800 inches of water. The claim has for years been on a good paying basis. The largest clean-up amounted to $17,000. It is not many months since when between $7,000 and $8,000 was the result of 45 days' washing. The monitor used throws a stream of 750 inches, one of the largest of its kind that is manufactured.

NEW YORK HILL.—Grass Valley *Union*, Feb. 22: A dividend of 25 cents per share is announced. This will amount to $9,250, being on 37,000 shares—the remaining 13,000 of the 50,000 shares of the capital stock being owned by the company. This dividend is paid out of the surplus of earnings that have been made in doing dead-work and opening the lower levels preparatory to getting in shape. The developments have been the extension of No. 9 drift north, No. 10 drift south, and sinking of the main incline. A new chuto of pay ore has been found on the No. 10 level. The last crushing of rock averaged $150 per load, and amounted to $11,000. No. 9 drift north, No. 10 south, and No. 11 north and south, are being driven, while the main incline is being sunk for another level.

CENTENNIAL.—A clean-up of 100 loads of rock, with the sulphurets, gave a yield of $8,000, or $80 per load. Another crushing of rock is accumulating on the dump.

PLUMAS.

NORTH FORK ITEMS.—Quincy *National*, Feb. 14: Some prospecting is being done at Dutch Hill. Wentworth & Co. are prospecting a new claim on a bar above Horseshoe point, and will bo likely to develop a good paying claim. They are well provided with everything necessary to open the mine, having a large water derrick and other conveniences. Brewster & Co. are running a tunnel and bringing water to a bar in the same neighborhood. This is all new ground which has never been prospected for the reason that it was difficult to open, and there are good reasons for believing that it will turn out well. The Sunnyside Co. have the tunnel in about 800 ft. They lost bedrock some time ago, but with the aid of a pump have managed to get down to it, and find some pay where they are working. The bedrock is raising, and will soon be up on a level with the tunnel. Cariboo is going along as usual. Orton & Keep have been making some money, and have good prospects for some more. Wilson & Moore have also been doing well. Thompson & Mather are getting fair pay for their labor.

PLACER.

WEST DAMASCUS GRAVEL.—*Argus*, Feb. 21: Tho shaft was sunk to a depth of 140 ft. from the surface, at which point a tunnel was run 100 ft, and a raise to gravel. Here the bedrock was found still pitching, and work was resumed in the bedrock tunnel and pushed 100 ft, and another raise put up to gravel, at which point some very good looking gravel was found, but the bedrock was higher than in raise No. 1. Gravel tunnels were then started from raise No. 1, one of them running due east and the other running northwest. The east drift has been run 100 ft, and the northwest drift 140 ft. The bedrock has been found nearly level in both drifts, except for the last 15 or 20 ft of the latter drift. They are losing the rock and better looking gravel is coming in.

ITEMS.—The Homeward Bound is the only claim at present washing, and judging from the roaring it makes, they must have some very hard dirt. The Hobson & Mitchler claim at Independence hill have worked one or two days this season, but are now laying off for want of water. The Morning Star have put off two bank blasts lately, and are now waiting for water to wash them off. The Scott, a mile below Newcastle, west of the railroad, is down 80 ft, and though the ledge is comparatively small at that depth the rock prospects quite favorably. Tho last crushing went $12 to the ton, and the ore now being taken out is thought to be much richer. The new 100-ft shaft and sump of the Mammoth Bar mine were completed on the 18th ult. The now 10-inch pump, working one hour in six, clears the mine of water. The drift is in 80 ft, and the upraise is up at a point 75 ft from the shaft.

SACRAMENTO.

SACRAMENTO DEEP GRAVEL.—Folsom *Telegraph*, Feh.21 Is in the bed of a deep river channel underlying a high gravel ridge, well defined, and extending for miles in a direction north of east, and south of west; its rim rocks are visible in places showing a width of channel from 100 to 250 yards. Their excavations have proved this chaunol to be very rich. It extends so far as their work has been prosecuted. This company commenced work some three years ago, and they are not as yet troubled with much water. Pay is found to extend from its outer or northerly rim towards the center of the channel, a distance of 150 ft. Crosscuts have been extended up and down the channel and found pay dirt that prospects from 5 cents to $12 to the pan; pieces are found of the weight and value of from 25 cents to $10, and quite a percentage is what may be called fine, yet it is heavy gold, heavily coated with a black substance somewhat resembling stone coal, such as is usually found in old channels called lead gold, and coins $19.40 to the ounce.

SHASTA.

GOLD IN MILLVILLE.—*Record*, Feb. 19: Considerable excitement was created by the discovery of gold on Main street. Henry Thomas, an old miner, picked up a piece about the size of a double B shot, and several others picked up smaller pieces between Baker & Teel's store and Simpson's hotel. A pan was obtained, a portion of the earth washed, and a considerable quantity of gold was obtained. Mr. Thomas expresses the opinion that with plenty of water the drirt would pay well. No locations have yet been made.

TUOLUMNE.

JOE HOOKER.—*Independent*, Feb. 21: A tunnel is run 60 ft, cutting the vein 80 ft deep. A level has been run on the chute from this point, 115 ft. The ore yields $25 per ton. At the south chute the vein is 2½ ft wide. This chute extends 240 ft. The ore averages $22 per ton.

HAZEL DELL.—The shaft is down 85 ft on the pay chute, which is five ft wide. The level is in 100 ft. The ore outside of pay chute mills $45 per ton. The lowest grade ore taken from the mine gave $8 per ton. Highest grade from pay chute $150 per ton.

NEVADA.

WASHOE DISTRICT.

ORTHA.—Gold Hill *News*, Feb. 25: The ore body struck east of the stopes of the Hardy vein, 2100 level, continues to increase in interest, and is being opened up both north and south, and in both directions shows more favorably than where cut by the original crosscut. The drift north on the Hardy vein, 2200 level, is in 108 ft in vein material giving low assays. The south drift on the same level is in a vein formation, its face 110 ft from the main drift east.

CALIFORNIA.—From a point in the north lateral drift, 300 ft north of crosscut No. 1, 850 level, a crosscut has been started west to explore the vein. It will be known as crosscut No. 2. Crosscutting west on the 1500 level has a total length of 70 ft. Tho crosscut east on the 2100 level to find the ore vein encountered on the 2000 level, continues in streaks of ore giving fair assays.

UNION CON.—The projected winze, from a point in the east drift on the 2400 level, 324 ft from the Union shaft, will be sunk to the 2400 level. The main east drift from the Union shaft on this level has been connected with the southeast drift, and the southeast drift is being continued on through the same heavy vein formation heretofore noticed; total length, 110 ft.

MEXICAN.—The north drift, 2300 level, has made connection with that south from the foot of the joint Union winze from the 2000 level, and completed the thoroughfare for that level from the Ophir incline to the Union shaft. The joint Union crosscut, 2300 level, is now 75 ft in length.

BELCHER.—The chamber for the winze to be sunk from the 2760 level has been completed and the winze commenced. Some fine bunches of ore have been encountered in cutting out the chamber. The winze is in the same formation, although 25 ft east of the ore streak first encountered. Working south on the 3000 level to get under the same formation.

JUSTICE.—The main lateral drift south and east on the 1650 level has been extended 550 ft from the Alta line. The southwest drift on the same level is being run to get under the promising formation on the level above. Crosscut No. 2 west, same level, is cutting vein porphyry, streaked with quartz, giving low assays.

ALICE & BENTON.—Length of north drift, 400 ft; south drift, 390. Some excellent ore has been developed at this point.

SIERRA NEVADA.—East crosscut, 2300 level, is in 100 ft in vein porphyry. North drift, same level, in good vein material. North drift, 2400 level, in 314 ft in porphyry mixed with low-grade quartz. Winze from same level down 53 ft, the bottom in good ore.

YELLOW JACKET.—The crosscut west, 2700 level, from a point 254 ft south of the shaft, is in 35 ft. The north winze is down 188 ft on the slope, below the 2700 level, cutting seams of quartz.

UTAH.—The east crosscut on the 1750 level is in soft vein matter, 160 ft from the incline. The south lateral drift is in softer vein porphyry; total length, 100 ft. Tho incline is 236 ft on the slope below the 1750 level.

HALE & NORCROSS.—The winze from the 2200 level is down 157 ft. Crosscut west, 2200 level, is in 220 ft.

CHOLLAR.—Tho drift south towards Potosi ground on the 2400 lovel has a total length of 275 ft. The face of the drift is in a dry clay formation.

CROWN POINT.—The joint Belcher crosscut east on the 2700 level is in 142 ft. The winzo is down on the slope 80 ft below this level.

JULIA CON.—The south lateral drift, 2000 level, is in 115 ft. It is being run for the line of the winze. The winze from the 1800 level is down 275 ft on the slope.

ANDES.—Sinking a winze from the 350 level. It is down 20 ft. Drifting east on the same level from point 50 ft north of the winze. Drifting west on the 200 level.

CON. IMPERIAL.—The north drift for the joint Alpha winze and on the 2800 level has a total length of 28 ft. The winze is 235 ft on the slope, below the 2600 level.

BELMONT DISTRICT.

BELMONT.—*Courier*, Feb. 14: The crosscut running west from the 300 level is in hard blasting ground, and has cut several stringers of quartz which are rich in silver, and the vein between this and the 200 level, for a distance of 150 ft, both north and south of this crosscut, has been very productive. The main 300 drift cut through a vein two ft thick, eight inches of which shows fair ore.

SAN ANTONIO.—The 450 crosscut is in 68 ft. The face is in hard porphyritic slate, and the formation and character of the rock shows that it is below all breaks and surface movements, and that the ledge on this level will be between two well-defined walls, as it is already developed on the 350 level.

JETT CON.—The shaft of the Centennial ledge is down 40 ft. The bottom is in very fine ore, which improves in quantity and quality as the shaft gains depth, and gives prospects of being a strong and rich silver vein.

BARNELL.—The main incline on the Blue Bell lode has been sunk 45 ft. The first 20 ft were through a break, when the ledge was again struck showing high-grade ore, which has continued to the end of the incline. The second east level has struck the east ore body, showing high-grade ore. An upraise from this level of 20 ft shows ore of the same grade. The first west level, at a depth of 175 ft on the incline, has been run 15 ft and stoping commenced in high-grade ore.

BRISTOL DISTRICT.

BRISTOL.—Pioche *Record*, Feb. 21: This company is looking for a mill site, it being their intention to put up a mill and furnace immediately, and also to sink an artesian well in connection with the mill and furnace.

THORNDYKE.—A vein of ore was struck assays of which go as high as $2 and $3 a pound. From average samples of the whole vein assays range from $873 to $2,300 per ton. It has opened out to over three ft, with an average assay of the whole ledge of over $600. It is gaining strength as work goes down, and everything is favorable for the opening out of a large ledge.

EUREKA DISTRICT.

EUREKA CON.—*Sentinel*, Feb. 21: The following work has been done in the several different levels: 1st—Winze sunk 24 ft; in all 44 ft. 3d—Northwest drift 31 ft; now in 117 ft. 7th—Northeast drift run 30 ft; now in 130 ft. North drift, 15 ft; now in 106 ft. Upraise, 32 ft; now in 49 ft. 8th—Southeast drift run 10 ft; now in 127 ft. 9th—Drift from raise, 12 ft; total, 24 ft. 10th—East drift advanced 76 ft, and now in 122 ft. West of incline run 9 ft, and now in 23 ft. 11th—East of incline, 10 ft; total, 112 ft. North crosscut No. 8 advanced 8 ft; total, 64 ft.

ESMERALDA DISTRICT.

DEL MONTE.—*Herald*, Feb. 21: All work in the mine has been centered at the 420 station in excavating for and putting in the plunger pump. The excavation is finished and the pump is in place. The next thing to be done is the putting in of two pump rods, after which the pump

CONTINUED ON PAGE 140.

Kodiak Island.

The following very interesting paper on Kodiak island was read by Mr. W. J. Fisher at a recent meeting of California Academy of Sciences:

In April last, I took passage on the whaling bark, *Mt. Wollaston*, Capt. E. Nye, for the harbor of St. Paul, on Kodiak island. After a two months' cruise along the eastern shore of Alaska, between Mt. Edgecumbe at the entrance to Sitka barbor and Mt. St. Elias, and on the so-called Fairweather ground, during which we touched at "Ochek" or Middleton island; we arrived at St. Paul on the 12th of June.

Our cruise along the different islands bordering the eastern shore of Alaska was very delightful. All the lower ranges of mountains were covered with either grass or forests, while the higher peaks still retained their winter babiliments of snow.

Very often natives in their boats boarded the vessel, offering skins and the products of the chase for sugar, molasses, tobacco and bread. All these natives were "Koloshes," the most warlike and enterprising Indian tribe inhabiting these latitudes. They seemed to be good-natured and jovial, but were extremely sharp in trade. The custom to paint the forehead, nose and cheeks black, with some pigment found in their country, did not tend to improve their appearance. The women, besides being painted, had a hole bored through their under lip, in which they wear a sharp, pointed piece of silver, or other bright metal.

About 40 miles north of Cross or Icy straits I observed two extensive glaciers, coming down the Mount Fairweather range of mountains and extending to the ocean. In front of the largest, a point of land with a solitary tree on its extreme end, had been forced far into the ocean. Huge masses of floating ice were drifting in Icy straits, making navigation dangerous.

On June 6th we sighted Ochek or Middleton island. The island is about 16 miles in length and rises very abruptly from the ocean to a hight of from 130 to 180 feet. The top of the island seemed to form a platform broken by numerous low hillocks. It is without trees, but covered with grass. It also has several fresh-water lakes, and is a great resort for water fowl. Both the north and south points of the island are prolonged by extensive reefs upon which the sea breaks heavily. Except in very calm weather it is difficult and dangerous to effect a landing. On account of the great number of sunken rocks, vessels should never approach this island nearer than three miles.

The Island of Kodiak is situated between 56° and 58° north latitude and 152° and 154.42° longitude at its widest part, between Capes Greville on the eastern and Ikolik on its western side. It is deeply intersected by innumerable bogs and inlets, and bordered, especially on its eastern and northern sides, by a great number of islands and small islets.

Shelikoff straits, about 50 miles wide, divides it from the main land of Alaska on its northern side. It has a great number of small rivers, the largest and most important of which, the Karluk river, empties into Shelikoff straits.

When I arrived at St. Paul the snow had all disappeared except on the highest mountain ranges. The lower hills and the valleys were covered with grass already several inches high, and interspersed with numerous brilliantly colored flowers.

The mean temperature of air during the month of July was 52°; for August, 55°; September, 49°; October, 39°. The warmest days in the above months were—

July 4, at 6 A. M.,	56°;	12 M., 64°;	6 P. M., 57°
Aug. 24, "	66°;	" 74°;	" 59°
Sept. 12, "	52°;	" 53°;	" 53°
Oct. 12, "	44°;	" 56°;	" 46°

During July we had clear days, 10; August, 22; September, 14; October, 24. In rainy weather the prevailing winds are most invariably easterly. I was informed that the past summer had been an extremely cold one.

At all the settlements on this island, especially on the adjacent Island of Atognak, potatoes of very fine flavor and good size are raised; turnips also grow well and of good size; radishes and lettuce thrive well; cabbages are a failure. Grass of excellent quality grows luxuriantly, attaining a hight of two to three feet. In August it is cut, dries very quickly, and stored for winter feeding. Cattle grow fat on it, and their meat is very tender and of fine flavor. When I left Kodiak in November, cattle were still at large.

Last summer being unusually cold, the generally abundant crop of blueberries, cranberries and malinas, the latter a species of blackberry of red color, failed to some extent. The natives gather large quantities of these berries for winter consumption, also the root of a liliaceous plant, *Frittillaria kamtchatensis*, which is used in place of potatoes.

There are no sheep kept on the isle, although I think they would thrive well here. Hogs are not kept, as they will feed upon the beaches on shell and other fish, and their meat becomes fishy and unpalatable in consequence. Chickens are plentiful, but their eggs are invariably of extremely small size.

The bays and inlets abound in halibut, codfish, herring and several varieties of salmon; the lakes and brooks are filled with delicious trout. The natives dry large quantities of codfish and salmon during the summer for their winter supply; and also collect large quantities of salmon spawn for the same purpose. During the summer a species of salmon of very large size is caught in the Kenay river, Cook's inlet. One minus the head and entrails, brought to St. Paul, weighed 91 pounds, and measured over 6 feet in length. This species is called by the natives, the king salmon, and is undoubtedly deserving this name. They are extremely fat and far superior as food to all other kinds. Codfish are caught close to the settlement, and in a day's fishing it is not unusual to catch from 200 to 300.

The numerous seal rookeries furnish also abundant food and oil. Occasionally a whale is captured. Then the whole settlement has a feast, whale blubber, no matter if rather strong in flavor and small, being accounted a delicacy.

The fur-bearing animals are but sparsely represented on this isle. Except the Alaska or cinnamon bear, still found in large numbers in the interior, all the other and most valuable fur-bearing animals are nearly exterminated.

In the lower portions of the island extensive forests of spruce exist, the trees do not attain a large size, however. On the adjacent spruce and woody islands, trees of large dimensions are common. The trees are very knotty and therefore not very serviceable for building purposes.

The harbor and settlement of St. Paul is situated in 57.47° latitude and 152.22° longitude, on the southeastern side of Kodiak island. Directly opposite the harbor is Blisky or Near island, the straits between, about 400 yards wide, forming the harbor. The village contains about 125 one-story dwelling houses, one church (Greek), stores and warehouses of the Alaska Commercial Company and Western Fur & Trading Company, and soldier's barracks, officers' quarters and store-houses, erected for and occupied by regular troops some years ago. The latter are, without exception, in a dilapidated condition, and in a few years hence will be uninhabitable. The village is irregularly built, and the streets need grading, etc. While the U. S. troops were garrisoned here, the streets were kept in good order and repaired when required. Bridges crossing the numerous small rivulets meandering through the settlement were built; culverts to drain off the surplus water from the lakes and marshes were constructed. But since the withdrawal of the troops nobody has taken the trouble to attend to necessary repairs, and as a consequence the streets are, with few exceptions, turned into gullies; culverts and dams have been washed out by freshets, and portions of the planking of the bridges have rotted away, and some of it has been used for firewood by the natives, making it dangerous to walk out in dark evenings.

The inhabitants, numbering not more than 500, are mostly Creoles. There are but few pure Aleuts residing here, and of the settlement of Koloshes (during the Russian regime brought over here from Sitka, and at that time numbering some 60 to 70 souls) only three families are now remaining. About 40 years ago a number of Creole families settled on Russian river in this State, returned to Kodiak island and settled at St. Paul.

The general health of the inhabitants is good. The most prevalent sickness among them is consumption. Their principal food consists of fish, either fresh or dried. The natives are all members of the Greek Catholic church, which is supported by the Russian government. But very few of them speak the English language, the current language being either bad Russian or Aleut. There is no doubt that the native population, as well on this island as on the main land, is gradually dying out.

The houses are all built of logs, smoothly hewn on the inner side, and the crevices filled in with moss. They are all of one story, and the rooms are kept nice, clean, and comfortable, in almost every instance. Only a very few of the former underground dwelling houses are now used. The stoves are built of brick with a number of flues running through them, are placed in the center of the house, and so constructed that each side forms part of a room. After being once thoroughly heated they will retain the heat for a long time, requiring only a small additional supply of fuel each day, and throw out sufficient heat to warm the whole house. For fuel the neighboring forests of spruce furnish a ready supply. This wood, although very knotty, is used in the construction of their houses; boats and even sloops from 5 to 15 tons burthen have been constructed therefrom.

A few of the natives are skilled mechanics, as carpenters, blacksmiths, bricklayers, etc. The present blacksmith at St. Paul does also attend to the repairing of watches and manufacturing jewelry. Wages are 50 cents and food per day for common labor. There is no regular physician at the village or on the island; a former hospital steward of the Russian American company attends to the physical well-being of the inhabitants. The vacancy occasioned by the death of the clergyman in March last has not as yet been filled, and the two deacons of the Greek church look after the spiritual wants of the natives.

The people are naturally peaceable, and but seldom serious disputes occur among them, which are always quickly and satisfactorily settled by appeal to the agents of the trading companies or the resident clergyman, so that the want of lawyers has never been felt. No land claims need adjusting. Everybody is at liberty to take possession of any unoccupied land, and there is no tax collector to collect taxes of any kind. There is no drugstore on the island. The Alaska Commercial Company keep a large stock of medicines at their several agencies, and distribute the same gratuitously to the sick and suffering without exception.

Comparatively few of the men of this settlement employ their time in trapping and hunting during the winter, the majority remaining at home in indolence.

There are a half dozen places in the village where whisky is made; a couple of kerosene tins and an old gunbarrel, and all the implements required to set up a still for the manufacture of this article, which is always in great demand and meets with a quick sale to both males and females. The marriage laws are not generally strictly adhered to; this is to some extent owing to the absence of a clergyman to perform the ceremony. There are no public schools; some of the children attend private schools. The Sabbath commences here at 6 P. M on Saturday, ending at the same time on Sunday. Divine service is held on Saturday eve and Sunday forenoon; it is well attended, principally by the female portion of the community.

In addition to the regular Sundays there is hardly a week without its additional holiday or saint's day, on which all labor is suspended and divine service held. The females, in addition to their regular household affairs, attend exclusively to the cultivation of their potatoes and garden patches, to gathering stores of berries for winter supplies, and to the curing and drying of fish; while the men devote their time to hunting and fishing, occasionally doing odd jobs of labor, when an opportunity occurs and they feel inclined to work, which but seldom happens. Parties engaged in curing codfish last summer found it difficult to engage natives to catch the fish, although as high as $2 per 100 was offered.

The several fur companies furnish not alone the hunting parties, but also their families, during their absence, with food, etc., to be paid for out of their prospective catch of furs. If the parties are unsuccessful, which often occurs, the respective companies have to bear the loss; if successful, the catch is brought to the store and paid for in coin only, and not in goods. There being three stores here at present, the natives enjoy perfect liberty to trade at which-ever store they prefer.

This island, as well as the whole Territory of Alaska, offers a large field in nearly every branch of Natural History, to the naturalist and collector. Before the cession of the Territory to the United States, Russian naturalists worked up its fauna to a large extent, but yet it is far from being exhausted. Through the liberality of the Alaska Commercial Company, who have instructed all their agents, stationed over a large portion of Alaska, to gather all specimens of Natural History, and to collect all data and items bearing upon the ethnology, geology, geography, mineralogy, zoology and climatology of their respective districts, we have gained a vast amount of information of this heretofore almost unknown portion of our country; and our own Academy, and principally the National Museum at Washington have been the recipients from this company of often repeated and valuable donations of specimens of Natural History pertaining to Alaska Territory.

There seem to be no doubt that the fur-bearing animals are gradually diminishing in numbers, and that, owing to the reckless violation of the laws made for the protection of this, one of the most valuable productions of the Territory, the time is not far distant which will see them utterly extinct, and it invites our serious attention to devise the means to prevent this result.

If our Government could be induced to divide the Territory into districts, lease each of them to a responsible party or parties for at least 20 to 25 years, at a yearly rental to be paid by the highest bidder, the Government would derive a certain yearly revenue, and it would be for the interest of the lessees to take measures to prevent the extermination of the fur-bearing animals.

1st. By stocking some of the numerous islands along the coast with some of the most valuable fur-bearing animals.

2d. By enforcing a strict compliance with the laws now in force, but always broken, prohibiting the killing of fur-bearing animals at certain seasons of the year.

3d. By the establishment of public schools, etc., to elevate the natives to a higher standard of civilization and a life of sobriety and industry.

In conclusion, I wish to express my sincere thanks to the Alaska Commercial Co. and their agent at Kodiak, for the kind assistance rendered me at all times in the prosecution of my labors while at St. Paul, Kodiak.

A Large Lake Dried Up.—Where at one time, says the Eureka *Leader*, was Ruby lake there is at present not a drop of water. This sheet of water, seven or eight years ago, was from 18 to 20 miles in length, and varied in breadth from half a mile to two or three miles, and was in a number of places very deep. It was fed by numberless springs along the foot of Ruby mountain, and was the largest body of water in eastern Nevada. For a number of years past it has been gradually drying up, until at last it has entirely disappeared. What has been the cause of this is a mystery. The Ruby range of mountains is considered the largest and finest between the Rockies and the Sierra Nevadas, and besides being well wooded, has been the best watered range of mountains in Nevada.

Town Sites and Mines.

An action, entitled "Town site of Silver Cliff *vs.* The State of Colorado," was commenced, to decide the legality of the town site, and thereby debar individual claimants from occupancy and possession of mineral locations within its limits.

The application to make such entry by the commissioners appointed for that purpose by the Board of Trustees of the town, was refused on the ground that the land involved was a school section and inured to the State of Colorado under its grant of sections 16 and 36, for school purposes.

The declaration of the town was filed, and a hearing was had to determine if said section 16 was known as mineral land prior to survey. It was shown beyond doubt that the land was known as such as early as 1864. The following are the salient points in the case:

1. The provision in the act of February 28, 1861, providing for a temporary form of government for the Territory of Colorado, respecting sections 16 and 36 in each township, was a reservation—not a grant; and those sections remained the property of the United States until granted by act of March 3, 1875, providing for the admission of Colorado into the Union.

2. By the proviso to the said act of March 3, 1875, all mineral lands were excepted from its operation; and any of said sections 16 and 36 known to contain minerals prior to the admission of the said State are excepted from the grant.

3. The grant as to such sections surveyed *subsequent* to the admission of the State, took effect upon the approval of the survey by the Surveyor-General.

The State claimed section 16 under the plea that when the lands were surveyed the surveyor did not class them as mineral lands. The following is the decision as rendered:

In the present case it is immaterial whether the land was known as mineral prior to survey or subsequent thereto, provided it was so known prior to the admission of the State into the Union, for at that date, and not sooner, said grant took effect as to non-mineral lands in said sections, which had then been surveyed.

The grant, as to such sections surveyed *subsequent* to the admission of the State, took effect at date of the approval of the survey by the United States Surveyor-General.

In the case now under consideration, the land was known to be mineral prior to both survey and admission of the State, and it is immaterial that the surveyor did not discover its true character.

It is also immaterial that said land was not worked and developed for its mineral until a recent period; for said act of March 3, 1875, does not provide that land which is worked for minerals shall be excepted from the grant, but "all mineral lands," whether worked or not.

The land in question is clearly not within the grant to Colorado for school purposes, but is government land, and subject to sale only under her laws.

The claim of the State is accordingly rejected. You will give due notice hereof to all parties in interest, allow sixty days for appeal, and thereafter promptly report action to this office.

Protests from claimants to mines within the town limits, against granting a patent to said town, which does not except there from specifically all surface ground embraced in such claims, and alleging location prior to town occupation, have been received at this office. Should the town make entry and patent issue thereon, it will contain only the following exception: "*Provided*, that no title shall be hereby acquired to any mine of gold, silver, cinnabar or copper, or to any valid mining claim or possession, held under existing laws: and *provided further*, that the grant hereby made is held and declared in subject to all the conditions, limitations and restrictions contained in section 2386 of the Revised Statutes of the United States, so far as the same are applicable thereto."

In case of the town site of Central City, Colorado, decided by this office December 23, 1875, and decision affirmed by the Hon. Secretary of the Interior, June 7, 1876, it was held that town-site entry could be made of land overlying lodes or veins, and that patent should issue for such town site, with said reservation only. Since the date of said decision this rule and practice has uniformly and without exception been followed, and under it the owner of a mining claim is secured in all those rights intended in he granted by the law.

You will notify the State that, should it file a written waiver of appeal from this decision, the case will be closed, and the town authorities permitted without further delay to proceed with their application for patent.

Very respectfully,

J. M. Armstrong, *Acting Commissioner.*

[A waiver of appeal was filed.]

Magnetic Influence of Atmospheric Polarization.—Henri Becquerel infers, from recent observations upon skylight polarization, the existence of a variable difference between the solar plane and the plane of polarization and the manifestation of a magnetic influence by the earth upon the atmosphere.—*Comptes Rendus.*

The Merchants' Telephone Exchange of New York City has 650 telephone lines constructed, the total length of which is 600 miles. It is the intention to connect the Exchange with the Central Telephone office in Philadelphia.

The Engineer.

Defective Flues.—The defective flue is having its day. In a late London *Architect* a list of burned churches is given, in which bad flues are stated as the cause in a number of cases. One of the Harvard College buildings was considerably scorched December 15th by fire from a defective flue, and we shall expect to hear of similar cases continually through the cold season. Here should be a lesson to architects to take greater care in this important detail of building. Mr. P. B. Wight in his address on "Fire-Proof Construction," before the New York State Association of Supervising and Adjusting Agents, said: "As a rule, the brickwork should not be diminished by the introduction of flues, but an amount equal to that displaced should be disposed on each side of a flue. By this means a buttress may be obtained. I adopted this rule while building in Chicago after the great fire, and in one of my buildings which was burned the importance of it was demonstrated, for in this case the walls of a six-story warehouse, with brick cornice, remained intact after the whole interior had burned out." —*Sanitary Engineer.*

A New Elevated Railroad.—Mr. Charles Leavitt is exhibiting in Cleveland, Ohio, working models of an invention which promises to do away with many of the objections urged against elevated railways. It is described as dispensing with the inconvenience of tracks in streets by substituting an elevated truss-work sustaining a single or double track, as may be desired, the cars being suspended under the track and coming to within about a foot of the pavement. The trucks travel upon the elevated track with an easy, smooth and almost noiseless motion, and are so secured that they cannot be forced from the rails. The appliance for propelling the cars consists of an endless steel wire cable, which extends the entire length of the road above the track and runs in a circle, so that cars upon one track are drawn in one direction, those upon the other in the opposite direction. The motor is a stationary steam engine, situated at one end of the road, which works directly upon the cable. The cable is attached to or detached from the trucks of the car by a clamp device, which admits of starting or stopping the car at any point.

Engineering Notes.—Of the present state of work at the St. Gothard tunnel, it is reported that a serious obstacle has lately been encountered in some soft strata, the enormous pressure of which has, up to the present, resisted all attempts at successful penetration. The most solid beams are bent after a little time, and a resistance wall of one meter thickness was completely crushed. Another of two meters thickness is now constructing. In these strata, the boring machine is useless, and only hand-labor can be employed. A bill has been introduced into the National House of Representatives for the creation of a permanently deep, wide and straight channel through Sandy Hook bar to the port of New York. On the 8th of December, preliminary work for the driving of the Mersey tunnel was commenced. The engineers will drive trial headings both from the Liverpool and Cheshire sides of the river, to determine the nature of the strata to be encountered before beginning the main railway tunnel.

The Hudson River.—As originally proposed, the Hudson River tunnel would have been a simple bore, large enough to accommodate two railway tracks. Lately the company have changed their plan, we are informed, and there will be two small bores instead of one large one. These will be bored throughout with three-eighth-inch iron plates. One reason for the change is that small tunnels will be stronger than a large one. The tunnels will meet and overlap about a foot. When they meet, the brickwork will form a partition and hold up the structure so that it will sustain a greater pressure from above and from the sides. It is believed that the workmen can proceed faster than by the old method, and that the work can be sooner completed than was at first anticipated.

The Tay Bridge.—A prominent civil engineer in London, E. W. Ives, has submitted to his professional brethren, at their request, a report on the Tay bridge disaster. Mr. Ives expresses the opinion that the whole bridge was of far too light and flimsy a character, especially the piers, which also he considers to have been badly designed to resist the under pressure to which they were subject. He believes that everything was sacrificed to cheapness and facility of construction, and that, in fact, the outlay was pared down to the lowest possible point.

Improving the Seine.—The *Journal des Debats* describes a plan about to be carried into effect for deepening the Seine, by which vessels drawing nine feet of water will be enable to reach the eastern extremity of Paris. The works will cost about $9,000,000.

Iron Railway Sleepers in Belgium.—It has been decided to use iron sleepers in future on the Belgian railways. The Cockerill Iron Works has accepted a contract for 300,000, and other contracts have been and are going to be distributed among the firms of La Louviere and Charleroi.

Useful Information.

Curiosities of the Locomotive.—Our first-class narrow-gauge engines weigh, empty, 44,000 pounds, and are worth 16 cents per pound. They will consume one cord of wood and 1,200 gallons of water per hour, and will generate 275,000 cubic feet of steam per hour, of a pressure equal to that of the atmosphere. Their heating surface is of the extent of the bottom of a boiler 34 feet in diameter. The strain upon the iron of the shell of boiler, to burst it open lengthwise of the boiler, is from 6,500 to 11,500 pounds per square inch under ordinary pressures. There is also an additional strain of about 4,000 pounds per square inch exerted lengthwise of the boiler to pull it apart crosswise. The whole pressuree exorted against all the internal surfaces of the boiler amount to 20,000,000 of pounds or 10,000 tons! The crown sheet of furnace, alone, carries a load of 120 tons! The usual distance traveled by the locomotive, being in motion but about one-eighth of the time, is equal to once around the globe every year. In going 60 miles an hour, 88 feet are traversed per second, five revolutions of the driving wheels are made, requiring 20 strokes of the piston, and 20 intermediate periods of action of the valve, equal to the division of a second into 40 parts.

Preserving Wood with Lime.—The improved French method of preserving wood by the application of lime is found to work well. The plan is to pile the planks in a tank, and to put over all a layer of quicklime, which is gradually slacked with water. Timber for mines requires about a week to be thoroughly impregnated, and other wood more or less time, according to the thickness. The material acquires remarkable consistence and hardness, it is stated, on being subjected to this simple process, and the assertion is made that it will never rot. Beech wood prepared in this way for hammers and other tools for ironwork is found to acquire the hardness of oak, without parting with any of its well-known elasticity or toughness, and it also lasts longer. It is said that the adhesiveness and durability of a solution of 100 parts of gum arabic in 250 parts of water may be greatly increased by adding two parts of sulphate of ammonia.

A Load for a Man.—Some interesting results have just been published of experiments made in France, in regard to this question, which are practically new. The maximum load for a moderate distance was found to be 319 pounds; but for a long distance, say a soldier marching on level ground, he could not carry more than 132 pounds, distributed over the body as knapsack, cartridge-box, musket, etc. If he carries this seven or eight miles for a day, it is equivalent to a good day's work. This is equivalent to 1,518 pounds carried a distance of 3,200 feet for a day's work. But if he ascends a ladder, like a hod-carrier, he can only carry 120 pounds continually, and will in a day carry only 1,230 pounds 3,200 feet high.

Malleable Bronze.—According to a recent German patent, taken out by M. Dronier, malleable bronze may be obtained by the addition of a small quantity—from one-half to two per cent.—of mercury. The action of the mercury seems to be rather mechanical than chemical, and it is not necessary that the mercury he mixed with the composition of the alloy. It may be added to either of the metals of which the alloy is to consist (being poured into the fused metal and stirred with it); or it can be introduced along with the tin, or soon after it, into the copper bath. Especially good results are obtained if a warm mixture of tin, with one to two per cent. of mercury, be formed and added to the melted copper.

Steel and Iron.—The total amount of steel and iron produced annually in the world, according to the report of Commissioner Morrell, to the Paris exposition is, of iron, 13,807,725 tons, and of steel, 2,770,524 tons. Of the iron, 43.63% was produced by Great Britian, 16.67% by the United States, 13.16% by Germany, 10.26% by France, 4% by Belgium, Austria and Hungary each furnish about 3%, and all other countries 4%. Steel is produced by England, about 40% of the whole, the United States furnishes 20½%, Germany 13½%, France 10%, and 7½% by all other countries.

To Keep Steel from Rusting.—To keep nice steel work bright and free from rust, after it has been filed and burnished: Dissolve 10 parts clear grains of mastic, 5 parts camphor, 15 grains sandarac and 5 parts elemi, in a sufficient quantity of alcohol, and apply the varnish without heat. The articles treated with this varnish will not only be preserved from rust, but their metallic luster will not be in the least dimmed by exposure to dampness.

Strength of Human Pull.—In regard to the effect and the velocity with which a man can produce by pulling or pushing with his arms, it has been found by some experiments that, under the most favorable circumstances, and for continuous work, an effect cannot be gained exceeding from 26.4 to 33 pounds raised from 1.8 to 1.2 feet per second, which is equivalent to about 4,000 foot-pounds raised one foot, or 4,000 foot-pounds, or one-eighth of a horse power.

To Remove Rust from Steel.—Steel which has rusted can be cleaned by brushing with a paste composed of ½ ounce cyanide potassium, ½ ounce castile soap, 1 ounce whiting, and water sufficient to form a paste. The steel should first be washed with a solution of ½ ounce cyanide potassium in 2 ounces water. To preserve steel rails from rusting, a good method is to paint them with melted caoutchouc, to which some oil has been added. The caoutchouc must be melted in a close vessel to prevent its burning, and should be frequently stirred. It is also said that dipping the steel in a solution of common soda (about 1 in 4) will preserve it from rusting.

Buried Oak Timber.—In deepening a river in the neighborhood of Norrkoping, says the *Timber Trades Journal*, in order to make it accessible for ships of heavier draft, among several objects of interest brought up from the bottom, eight oak trees were found at a depth of seven feet under the old bottom. The bark was almost decayed, and when it was taken off, the wood was found to be hard and black, resembling ebony. The trees are supposed to have been lying in the earth 900 years. The trees have been sold to a firm of joiners, who intend using them for cabinet work.

The Metric System.—It may not be generally known that we have, in the nickel five-cent piece of our coinage, a key to the tables of linear measures and of weights. The diameter of this coin is two *centimeters*, and its weight is five *grammes*. Five of them placed in a row will, of course, give the length of the *decimeter;* and two of them will weigh a *decagramme*. As the *kiloliter* is a *cubic meter*, the key to the measure of length is also the key to measuree of capacity. Any person, therefore, who is fortunate enough to own a five-cent nickle, may carry in his pocket the entire metric system of weights and measures.

A Hard Composition.—Melt together over a gentle fire in an iron pot: Pitch, one part; gutta-percha, two parts; orange shellac, five parts; add to this six parts of white lead (lead carbonate) in impalpable powder, and stir until a perfectly homogeneous mixture is obtained, and you will have a composition hard enough to make pool bells, which may be cast and colored with analine dyes mixed with dilute alcholic solution of bleached shellac.

To Case-Harden Cast Iron.—In three gallons of clean water mix one-half pint of oil of vitriol and two ounces of saltpeter. Heat the iron to a cherry-red and dip as usual.

Good Health.

Clothing in its Relation to Health.

Approximately, the human body when clothed resembles a steam jacketed pipe; the clothing forms the outer covering, between which and the body there is a layer of steam and heat, and which are constantly ascending. The place where this current of hot air and steam passes out into the atmosphere is the narrow ring between the neck and the shirt collar. This opening plays, therefore, an important part in the maintenance of the temperature of the human body. If it is enlarged, the heat and steam escape more quickly, and the skin is soon cooled; if, on the contrary, it is wholly or partially closed, by being closely buttoned or by a muffler, then the loss of heat is stopped, and the temperature of the skin raised. Thus there is nothing more injudicious than the constant wearing of a muffler or the thick neckerchief of our forefathers, because it impedes the evaporation of the matter which ought to pass out of the skin; though, for the same reason, it is of great value in case of cold.

While the dampness of the atmosphere affects the evaporation through the lungs as well as the skin, clothing, by night as well as by day, regulates that of the latter. All covering which impedes this evaporation, acts injuriously. Though no material is quite faultless in this respect, there is still a great difference in their structure. The less they are impervious, the more they are to be avoided. India rubber stands at the bottom of the list, for it does not admit of the passage of any water; leather comes next; less objectionable, but still repellant, is linen, as an instance of which we may mention the blue linen blouses worn by the Belgians and Dutch over their other garments as a kind of waterproof. Cotton has a great advantage over the foregoing, as it is to a certain extent porous; but the best of all percolators is a woolen material. A flannel shirt is more healthy than a cotton one; a woolen blanket at night than a linen sheet.

The action of the skin depends also upon the circulation of the blood under its surface, and the latter is promoted by outward friction. A material which induces the latter is therefore also more healthy, and rougher underclothing, such as woolen or coarse cotton, are preferable to the enervating finer linen or silk.

Another point to be observed is the keeping of the skin warm, because warmth keeps the pores open, while cold contracts and closes them; and here again woolen clothing stands first.

Thus it is proved that in point of porousness, friction and warmth, woolen clothing is to be preferred to all others.

But not only the material of the clothing is of importance, but also its cut. In warm climates, where clothing is more a luxury than a necessity, the loosest garments are the best; but in those latitudes where a certain amount of warmth has to be obtained by clothing, the garments must be worn more closely fitting. We have before likened the human body to a steam jacketed pipe, where this steam is constantly in an ascendant motion; the faster this circuletion takes place, the more is the skin cooled; it follows, therefore, that the most regular and constant evaporation is maintained by closely-fitting garments, and the soldier's uniform is therefore the healthiest of all.

We need not here enlarge upon the very extended use of flannel underclothing, especially as shirts, which has come in vogue since cotton clothing rose to such exorbitant prices during the American war, and which, once appreciated, has not been abandoned since. This has also led to the production of a great many textile fabrics containing more or less wool mixed with cotton or other fibers, in order to counteract the shrinkage of the latter and make the fabrice more adapted for washing, one of the products being the vigogne yarn, to which we have lately drawn attention.—*Textile Manufacturer.*

Effect of Plants on the Health.—The popular belief that plants kept in the house are injurious to the inmates, is purely fanciful. Under the influence of sunlight the leaves of plants absorb carbonic acid from the atmosphere and decompose it, yielding back the life-supporting oxygen, from which the inference might be justified that they were rather wholesome than otherwise. On the other hand, it has been shown that when the influence of light is withdrawn, this action of the plant is temporarily suspended—the plant sleeps, and the excess of carbonic acid gas taken up during the day is given off at night; and because of this action, the presence of plants in sleeping apartments has been thought to be unwholesome or injurious. The bad effects to be attributed to plants from this cause are too trifling to be worth serious consideration. The inhabiting of sitting and sleeping apartments warmed by baked air drawn from foul cellars, the neglect of means to secure proper ventilation, especially in sleeping apartments, and the poisoning of the atmosphere of dwelling houses by the entrance of sewer gases through leaky traps, are very real and common dangers, compared to which the one alluded to sinks into utter insignificance, if indeed it be worthy to be considered at all.—*Manufacturer and Builder.*

Starving out Cancers.—At a late meeting of the Leeds (England) Medical and Chirurgical Society, Mr. J. W. Teale read a case of quiescent scirrhus. The patient was an unmarried lady of 35. A cancer formed in her breast, causing retraction, and ultimately the loss of the nipple; it ulcerated; some axillary glands enlarged, and the patient seemed about to die. But, in consequence, as it seemed, of the small quantity of food taken by the patient, the cancer was "starved." It atrophied slowly; and now, nine years after its first appearance, there was nothing but a hard cicatrix left in the breast and axilla. Cases more or less similar were related in the discussion which followed. —*Med. and Surg. Reporter.*

Arrowroot for Infants.—Dr. Routh says, in his Infant-feeding and its Influence on Life: "I cannot conceive of anything more injurious than arrowroot feeding. I believe that it is a cause of death of many infants." Dr. Davis says, in the *Virginia Medical Monthly*, that there is perhaps no error more common than that of administering to the infant arrowroot, corn starch, tapioca, or other starch foode. Not till after dentition is *diastase* secreted by the salivary glands, and starch food remains in the stomach and intestines non assimilable as a foreign substance, only disposed to irritate the delicate membranes.—*Louisville Med. News.*

Important Advice.—Beware of salves, beware of plasters, beware of eye-waters, beware of hair-dyes, beware of washes refining the skin, beware of toilet powders, and be careful in the use of scented soaps. Why? Salves make and keep the skin sore, plasters prevent wounds from healing, eye-waters do often more injury than good, most hair-dyes produce sore eyes, beautifying washes are often poisonous, ditto toilet powders, while scented soaps are usually too sharp by the free alkali they contain.

Chops and Steaks for the Sick.—In cooking steaks for the sick, they should always be cut about one inch in thickness. Beat it well with a rolling pin. This renders it tender and preserves the juice. Place upon a broiler and cook for seven or ten minutes, turning frequently. When done lay it upon a hot plate and season with salt and pepper and a little butter. Never chop meat with a sharp instrument. It severs the fibers, thus allowing the juice to escape while cooking.

Treatment of Simple Hiccough.—Dr. Grellety once saw a mother, tender and full of affection for her children, give them a morsel of sugar dipped in table vinegar whenever immoderate or too rapid repletion of the stomach or any other cause had induced hiccough. The latter ceased, as if by magic. Since then the Vichy physician has very frequently employed this means on his own account, and has never found it without avail.—*The Pharmacist and Chemist.*

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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The Week.

The weatber still remains unsettled, though tbe raine which have fallen have produced a good effect upon the growing crops, and have made certain a plentitude of grain for the ensuing harvest. The season has now so far advanced that we must be soon favored with clear ekies and genial sunshine.

In our mining sections there is a marked activity, not particularly in speculative movements, but in legitimate transactions. The output of bullion is continuous, and in some districts the yield is very favorable. New discoveries are being made of rich locations in Utah, Colorado and Arizona, and many of the mines are sending large quantities of treasure to their owners. By a reference to our "Bullion Shipments," in another column, a gratifying corroboration of this statement can be seen.

Our legislators, both in National and State councils, are modifying some of the existing mining laws, but it is to be hoped that they will not make as many changes as are talked of in connection with general business matters. In fact we have too much legislation and too many changes in laws. We hope that the mining laws will escape this general action, and that only those changes found absolutely necessary will be made.

THE annual meeting of the stockholders of the Murchie Mining Co. was held on the 17th, when the following named gentlemen were elected as Directors: A. Snider, E. T. Barber, A. V. Kautz, W. S. Schuyler, Jacob Naffziger, A. N. Shillingford, Joseph May, G. E. Bsunison, G. G. Francis, R. L. Tracey and S. D. Rogers. The following officers were elected: President, A. Snider; Vice-President, G. E. Bsnnison; Secretary, S. D. Rogers; Treasurer, Bank of California; Superintendent, W. S. Schuyler. The bullion yield of the mine for the fiscal year was $124,420, all gold, of which $67,026 was from sulphurets.

The Coming Prosperity of Mining.

For some years past there has been a lull in the development of mines in California. This was produced through the agency of various causes. The general depression which pervaded the business and financial circles of the nation was one of them. During its existence but few enterprises were inaugurated. Capital shrank from investment. Among our own citizens there was not capital enough, even if they had been willing to employ what they did possess, to fully open up all the mining properties which discoverers were endeavoring to bring into notice. Outside capital could not be obtained because the stringency was more sensibly experienced in other portions of the Union than here.

Restrictive legislative enactments; change in the basic laws of the State creating doubt and uncertainty as to their future operation and effect upon mining adventures; a partisan attack upon the rights of property holders; and violent threats against capital by discontented labor, all aided still further to check the prosecution of mining industries and added to the general stagnation in this field of enterprise.

But with an increasing prosperity, and a restoration of confidence, combined with the unprecedented influx of gold from foreign nations, an incentive was produced which has led to a recognition of the advantages of well-conducted mining. This in turn has been still further fostered by the rich yield of the mines that have been worked during the interval of quietude.

There were many mines in which the work was continued, but with a more decided care as to the economy and necessity of expenditure. Under this cautious management the income was in excess of the cost. There were many mines in which the work did not cease, but which for the time paid no profits, because a great amount of dead work was being done in them to enable them to give out their treasures when it should have been accomplished. This latter class, being now fully opened and equipped, are sending out their rich returns of valuable ore.

The merchant has to build and stock his store before he can begin to realize a profit upon his capital. So mines must be fully and completely opened before they can be made permanently productive.

With the expenditure of the past labor, and the consequent increase of yield, such alluring inducements are held out for the employment of capital in the still further advance of mining operations, that the subject has assumed almost the phase of an universal mania. Capital rushes forward to participate in the prospective profits of mining from which, but a comparatively brief time since, it shrank with nervous timidity. The result of this course is manifesting itself in the renewed energy which is displayed not only in our own State, but in every State where mines exist. From Maine to Georgia, from the Atlantic to the Pacific, the mines are yielding such treasures as they have never done before. Money is forthcoming from the coffers, where it has so long lain in idleness; it is withdrawn from other branches of industry where the profits are not so promising and placed, without reluctance, in the exploration of veins and placers.

The result of all this labor and employed capital in this wide field will be a continually increasing output of mineral wealth. The prosperity of the nation will be vastly increased; individuals will amass princely fortunes, and thousands of sturdy workers will find remunerative employment. An impetus will be given to all branches of trade and labor, which will be permanent and enduring, because it will be based upon and supported by solid wealth. It will not be fostered by a speculative advance in nominal value, which, in reality, is but a myth, a delusion and a snare, but it will receive its vitality from the positive creation of material wealth. Upon this basis it will stand firm and strong, and cannot be overthrown.

It needs no prophetic power to foretell the advent of better and more prosperous times, from the incentive given to and the profits arising from the working of the mines.

SKAGIT MINES.—We hear from a gentleman who has recently returned from Puget Sound that it is highly probable the reports concerning the Skagit mines are exaggerated. He was informed by miners from there that it was from 10 to 20 feet to bed-rock, and the many boulders were very troublesome. There may be a good deal of gold, but it is very hard to get out. Mining there has been carried on for a number of years, but until now there has been no special excitement. Our informant thinks the Seattle people like to have this excitement fostered, thinking it will benefit their town. He says the mines are not considered a very "big thing" by those who have been there.

HOLDERS of quicksilver are generally asking 45 cents per pound, under decreased production, and in consequence of the laws forbidding corporations to employ Chinese.

THE passenger list of the Pacific Mail steamers and the Overland railroad has heavily increased since the reduction of fare.

A State Mining Bureau.

Assemblymen Joseph Wasson, of Mono, deserves the thanks of the mining community for endeavoring to call the attention of the members of the Legislature to the fact that there are mines in this State, and that the mining interests which produce to California twenty millions of dollars a year, are worthy of consideration. Mr. Wasson has a pretty hard job to make the other members believe there is anything else connected with mining but certificates of stock, and as mention of stocks to most of the members is as a red rag to a bull, Mr. Wasson's efforts are praiseworthy, to say the least. Mr. Wasson is, we are pleased to say, a journalist, and an intelligent one; and he is also a miner and knows the importance of the mining interests. He has introduced several bills during the session relative to mining matters; two of which we print in this issue. In fact he is the only member of either house, so far as we recollect, who seems to have any intelligent idea of mining matters, or who cares to assist in building up the industry. Most of the others seem to want to break it down. He recognizes the fact that at present there is no official source from which information concerning our mines may be obtained by miners, prospectors or intending investors, and has, therefore, introduced the following bill to provide for the establishment and maintenance of a Mining Bureau:

SECTION 1. There shall be and is hereby established in this State a mining bureau, the principal office of which shall be maintained in the city of San Francisco, at which place there shall be collected by the State Mineralogist, and preserved for study and reference, specimens of all the geological and mineralogical substances, including mineral waters, found in this State, especially those possessing economic or commercial value, which specimens shall be marked, arranged, classified and described, and a record thereof preserved, showing the character thereof, and the place from whence obtained. The State Mineralogist shall also, as he has opportunity and means, collect, and in like manner preserve at said office, minerals, rocks and fossils of other States, Territories and countries, and the collections so made shall at all reasonable hours be open to public inspection, examination and study.

SEC. 2. It shall be the duty of the Governor to appoint a citizen of this State, having a practical and scientific knowledge of mining and mineralogy, to the office of State Mineralogist, to hold his said office for the term of four years, or until the appointment and qualification of his successor, who shall take and subscribe the oath of office prescribed by the Constitution, and who shall receive for his services a salary of three thousand dollars per annum, to be paid as other officers of the State are paid, and shall also receive his necessary traveling expenses when traveling on the business of his office, to be allowed and audited by the State Board of Examiners, the whole to be paid out of the mining bureau fund hereinafter provided for, and not otherwise.

SEC. 3. In addition to the collection, classification, arranging and preservation of specimens as provided in first section of this act, it shall be the duty of the State Mineralogist to make analytical assays as required, and when the funds in the mining bureau fund are sufficient therefor, to provide and maintain a library of works on mineralogy, geology and mining, to arrange in cases such specimens as he may collect, to procure and preserve models and drawings of mining machinery, and of milling machinery used in the reduction of ores, to correspond with established schools of mining and metallurgy, and obtained and preserve for public inspection and use such information respecting improvements in mining and mining machinery as will be of practical value to the people of this State; to visit the several mining districts in each county of the State, from time to time, ascertain and record their history, describe their geological formation and altitudes, the character of the mines and ores, and the general development of the district. At the close of each year he shall make a report in detail to the Governor, showing the amount of disbursements of the bureau under his charge, the number of specimens collected, and giving such statistical information in reference to mines and mining as shall be deemed important.

SEC. 4. The State Mineralogist may from time to time, and as the funds in the mining bureau fund will permit, appoint such assistants as he may deem necessary and proper for the carrying out of the objects of this act, and the efficient provision and maintenance of a bureau of mining information and statistics, and may procure and maintain the necessary rooms and furniture for the office and uses of the bureau in San Francisco; but the entire expenses of the bureau for salaries, assistance, rents, furniture, fuel, and all other things pertaining to the bureau must not, in any one year, be greater than can be paid out of the mining bureau fund herein provided for.

SEC. 5. For the purpose of establishing a fund for the maintenance of said mining bureau, it shall be the duty of the Tax Collectors in the several counties in this State, and of the License Collector of the city and county of San Francisco, on the second Monday in January, April, July and October in each year, to transmit by express to the State Treasurer all moneys collected by them from mining corporations, or from corporations formed for milling ores, or for supplying water for mining purposes, under or by virtue of the act entitled "An act imposing a tax on the issue of certificates of stock corporations," approved April 1, 1878, and to forward to the State Controller by mail a certificate showing the amount of money so forwarded to the State Treasurer, and the date when the same was transmitted, and also showing the names of the several corporations from which the same was received, and the amount received from each. The State Treasurer shall receive the amounts so transmitted and give duplicate receipts therefor, one of which shall be filed with the State Controller, and the other shall be returned by mail or return express to the Collector from whom the money was received; and after paying out of the money so received the charges for the transmission thereof, the amount of which shall be noted on the receipt filed with the State Controller, he shall retain the remainder in his hands as a separate fund, to be known as the mining bureau fund, to be used only in payment of drafts made for the expenses of the mining bureau established under this act, and out of which all the expenses of said bureau shall be paid.

SEC. 6. Such tax collectors and license collector shall hereafter be required to pay into the county treasuries of their respective counties only that portion of the moneys collected by them under the act of the Legislature mentioned in the last preceding section, which is collected from corporations other than those mentioned in section five of this act.

SEC. 7. This act shall take effect and be in force from and after its passage.

Is our Coal Oil Industry in Danger?

The United States has in the product of its oil wells an actual monopoly of coal oil in the markets of the world. It is to this country that all other nations have to look for their supply of that article. The production has reached the enormous amount of nearly 20,000,000 barrels per annum, and there does not appear to be any signs of a decrease save in some individual localities, which is fully compensated for by the discovery of new oil districts in many other sections of the Union.

But if we may credit the verity of the information which the cable wires bring to us, there appears to be an impending danger of a rival coming forward to contest our supremacy in the markets of Europe as producers of it. While it is somewhat singular that so important a subject should be confined to the meager record of a solitary dispatch, still it is not impossible that it may be founded on fact. If it should be so, we certainly will hear more fully from the oil basin in the Hanoverian region.

The amount produced thus far in the deepest borings there has been almost too insignificant to notice; being only four cwt., or about 60 to 70 gallons, equal to one and one-half barrels per oil well per day. Still, as the quality of the oil is improving as the borings deepen, which is generally the case in our own wells, it is not impossible that they may be approaching a permanent and extensive basin. The ancients knew of the existence of oil springs ages ago, but they only made use of the oil for external application as a relief for pains and bruises. That springs in different parts of Europe which give limited quantities of oil do exist is a well-established fact. If boring should be instituted in these places it might lead to new and important discoveries. A large flow of oil in Hanover would be detrimental to our sales in Europe; it would diminish them, if it did not cut them off altogether. But if it should effect the latter result, while it would lessen the demand and would materially deteriorate the value of our oil wells, it could not cripple them. Our own consumption of the oil is constantly increasing, and it is possible that the increase would equal the falling off which the loss of the markets of Europe would occasion.

Unless the yield in Europe becomes equal to the demand there, the discovery of oil basins can not have more than a temporary influence of this industry with us. But if their wells should prove as productive as our own, the effect would be serious, as they would then compete with our sales in other parts of the world. Had the prospects been at all flattering, we imagine the fact would have ere this been loudly proclaimed. It may be but a hoast, or perhaps only a hear movement in the oil markets.

MEXICAN MINING.—We learn that at the Candelaria mine, San Dimas, Mexico, the tunnel for draining the mine, upon which they have been working for 16 years, has been completed, and 400 feet of water drawn off. They find an abundance of good ore exposed, mainly silver but carrying about one-fifth of its value in gold. The company have just shipped a "Davis" grinder and another Payne engine, down to the mine from this city. The grinder is to be used in preparing the ore for the arastras, so as to increase their capacity. They do not propose to abandon the patio process. Plenty of water power is available for driving the arastras. They have used a Payne engine, which they bought of H. P. Gregory & Co., of this city, for two years, and it has given great satisfaction. The mine is owned by a private New York company and no stock has ever been put upon the market.

Tonite Powder.

A new company has been incorporated in this city with a capital stock of $1,000,000 in 10,000 shares, for the manufacture of Tonito powder. Among those connected with the company are Thomas Bell, Hamilton Smith, Jr., L. L. Robinson, Julius Baum, John Wedderspoon, William Ashhurner, W. Letts Oliver, David Cahn and R. L. Shainwald. The office of the company is at No. 123 California street, Mr. R. L. Shainwald being Secretary. It is proposed to erect large works near this city shortly for the manufacture of this powder.

Although just introduced on this coast the Tonite powder has been for several years in use in Europe, where it is known as "patent cotton powder." The special advantages claimed for the powder are its great power and safety, and the absence of smoke or noxious fumes. It may be used like common gunpowder and be free of danger of explosion in transit and in storage. Another point is that it is fit for service at all seasons and in all climates, never freezing as do the nitro-glycerine compounds.

We can probably give our readers the best idea of the qualities of this powder by quoting from a report on it by Prof. Attfield, London analyst, to the fire insurance officers, this gentleman having made the examination with special reference to the question of safety of transportation on railways.

With this object in view, Prof. Attfield suggested a series of experiments on a considerable scale, at the conclusion of which he expressed himself as satisfied that the cotton powder was less dangerous to handle, transport or store than common gunpowder. On the strength of this report, the railway authorities admitted of its transportation on all railroads in Great Britain on the same terms as ordinary gunpowder.

We quote Prof. Attfield's description of some of the experiments:

1st. A mass of iron weighing half a ton was let fall from a hight of 15 feet on to a box containing 10 or 12 pounds of powder. It did not ignite the powder.

2d. An unusually well-made powder barrel, strongly hooped and headed, containing between 30 and 40 pounds of the powder, in the form of cartridges of various sizes, was placed over some faggots saturated with tar, and a large bonfire kindled. In four minutes the cartridges ignited, and merely burned quietly for some 30 or 40 seconds. Every cartridge was entirely consumed without any explosion whatever.

3d. A box, holding 10 or 12 pounds of the powder, was next fired into from a rifle at a distance of about 20 yards. The bullet ignited the powder, which burnt rapidly but quietly away without explosion.

4th. A cartridge was placed in an open box containing two pounds of common gunpowder, and this latter fired by a fuse. The cartridge was blown some yards, but not exploded. The same cartridge was afterwards fired by the usual means.

5th. Strong sparks of electricity were next passed through some of the patent powder without effect.

6th. Many blows of an iron hammer on an iron anvil failed to ignite portions of the powder, and when ignition was at last effected, the adjacent portions of powder were merely blown on one side without being exploded.

7th. Concentrated acids (oil of vitriol and fuming nitric acid) were both successively and together poured on to portions of the powder without visible effect.

8th. Lastly, to show the power of this patent cotton gunpowder when intentionally exploded by detonation, a 12-inch baulk of timber was shattered by four small cartridges; a fountain of water 80 or 100 feet high was thrown up by the explosion of a floating box of the powder; and a hole in the marshes, eight feet across and four feet deep, was instantly produced on exploding 11 pounds of the powder.

All of these explosions of the Tonite were effected by special detonators, made for use with this powder. Prof. Attfield says with regard to the danger of spontaneous explosion, this powder is even less liable than ordinary gunpowder to this form of decomposition.

We are informed that the closest workings may be entered immediately after the explosion of this powder without any bad effects from noxious fumes. It can only be exploded by a special detonators.

We examined some of the cartridges of this powder prepared with a receptacle for the cap, so that nothing but the capped fuse is necessary to be inserted. It is not necessary to ram the charge or break it up to fit. The first-class cartridges are pressed by hydraulic power into a short stick like a candle, this being covered with paraffine, etc. Being excessively strong, labor is saved in drill holes, less holes being needed than with common explosives.

This Tonite or patent safety cotton powder is used not only for blasting, but for guns, torpedoes, etc., the preparation for these purposes being slightly different. An important point in its favor on this coast is its non-liability to freeze, heat or cold not affecting it. The company recently organized will soon begin to manufacture the article, when we shall have more to say on the subject.

The Payne Engine.

The accompanying engraving represents the Payne engine, with wrought-iron boiler. These engines are made in sizes from 3x4 up to 14x18, and a great number of the small ones are in use on this coast, all giving satisfaction. The engines are sold with or without boiler, and are supplied with the Taber automatic cut-off governor. Fig. 1 of the engravings show the engine and boiler combined; Fig. 2, the engine alone; and Fig. 3, details of the Taber governor.

The engine has some features not possessed by any other, among which are the following: The cylinder and frame and bottom of bearing are all contained in one casting and are all finished on centers, and the cylinder and guides bored at one time. Each engine is supplied with a substantial adjustable cross-head, with wrought-iron cranks. The valve is what is called the piston balanced valve, and works with the least possible friction. It is placed close to the cylinder, so as to have short ports, and leaves very little live steam between the valve and the piston head, thus making a saving of steam and giving the governor a great advantage.

The power of the governor is applied directly to the main valve of the engine without the intervention of a belt, which is very desirable, as many accidents have occurred of serious nature, caused by the breaking of a governor belt, or it having run off the pulleys—an occurrence that has happened one or more times in the experience of all who have been connected with engines and governors; and many times the effect of the governor is lost by a slipping belt. The motion of the engine can be readily changed fifty revolutions, by simply loosening or tightening the tension nuts on spring *E*. A large saving of fuel is accomplished by the use of this device—as the amount of steam entering the cylinder will be governed by the position of the eccentric on the shaft. The eccentric is operated by the weights *D*, which are thrown out by the centrifugal force, less or more, as work is applied to the engine.

The amount of steam admitted to the cylinder is governed by the position of the eccentric on the shaft, thus effecting a large saving of fuel. Messrs. H. P. Gregory & Co., Nos. 2 and 4 California street, in this city, are the agents. The design of the engine is handsome, and all the parts are finished in a perfect manner. A special boiler is made for yachts. It will set low in a boat. The liability of the upper ends of the flues leaking is obviated, as the water may be carried high enough to protect them from the fire, and yet it will furnish dry steam from the dome, which is in the smoke bonnet. The yacht engine is provided with reversing attachment, but with no balance wheel or governor.

THE gross earnings of the Chicago and Alton railroad for 1879 were $5,755,677—an increase of $1,083,158.

Fig. 1

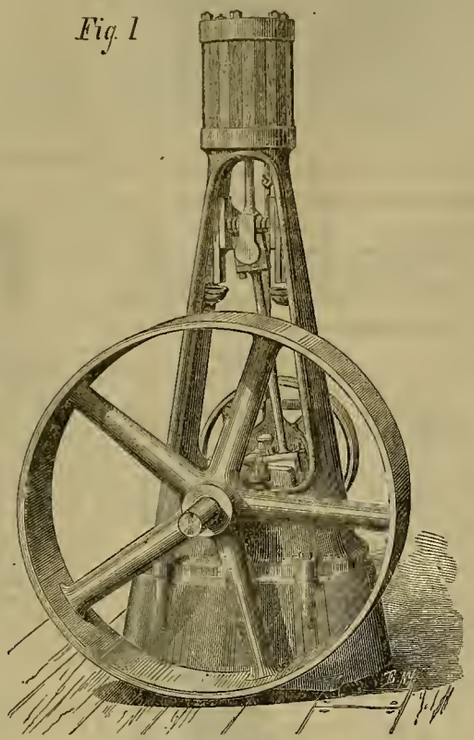

FIG. 1. PAYNE ENGINE AND BOILER.

Fig. 2

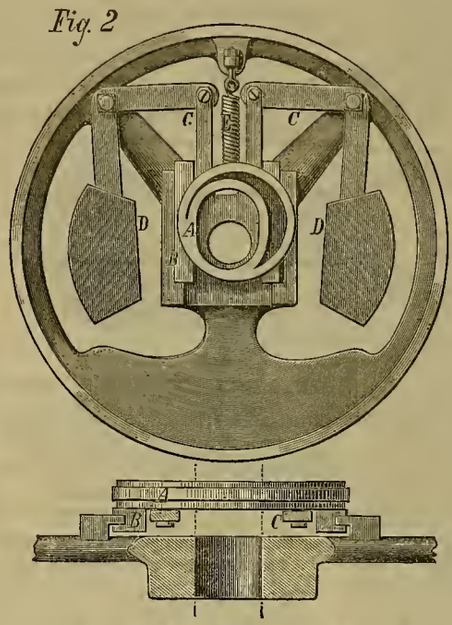

FIG. 2. THE PAYNE VERTICAL ENGINE.

Legislative Matters.

Among the many bills for "regulating" dealing in mining stocks, Assemblyman Maybell's is the one which truly wants to wipe out the whole business. Not only that, the bill also proposes to legislate people into honesty, an effort in which we greatly hope Mr. Maybell may succeed. The sections are as follows:

SEC. 327. Every person who establishes, keeps open or conducts any stock exchange, stock board, or other place (except private brokers' or business office) for the purchase and sale of the shares of the capital stock of any corporation, or in any manner aids the same, is guilty of felony.

SEC. 328. Every person who buys, sells, gives away, or in any manner whatever furnishes or transfers to or for any other person any share or shares of the capital stock of a corporation, or any interest therein, or any paper, certificate, or instrument purporting to be such share, or any interest, in any place prohibited by the preceding section, is guilty of a felony.

SEC. 329. Every person who makes any false representation as to the value of any mine or any interest in any mine in any corporation, or who makes any pretended or fictitious sale for the purpose of inflating or depressing the real value of any such interest, is guilty of felony.

The following bill, introduced by Mr. Johnson, is probably intended to stop hydraulic mining, as Maybell's is to stop dealing in stocks.

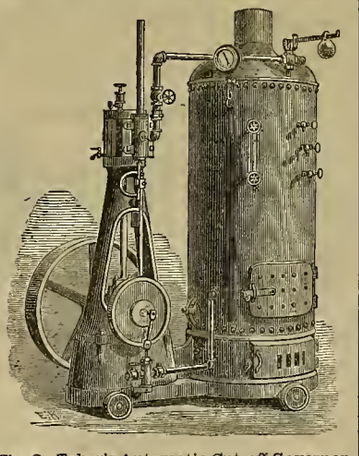

Fig. 3. Taber's Automatic Cut-off Governor.

The quartz interests will probably soon receive a set-back also:

SEC. 1. Every person who runs or permits to run from any mine, tailings or debris upon the land of another, is guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of $500, and by imprisonment in the county jail for six months.

SEC. 2. The offense shall be deemed to have been committed in the county where the lands are situated upon which the tailings have been run or permitted to be run.

SEC. 3. This act shall be in force from and after its passage.

Another bill by this same person is as follows:

SEC. 1. Every person or corporation injured in any manner by the flow of tailings or debris from the mine, may maintain an action for damages, jointly, against all persons and corporations contributing to such injury.

SEC. 2. This act shall be in force from and after its passage.

Still a third bill by Mr. Johnson is as follows:

SEC. 1. In any action for an injury to lands or possessions from the flow of tailings or debris from the mines, the plaintiff may unite as defendants all persons or corporations who have contributed to such injury, and the action shall be tried in the county where the injury is sustained.

SEC. 2. This act shall be in force from and after its passage.

The following bill, introduced by Mr. Wasson, of Mono, amends a similar bill passed in 1872, said act being for the special "protection of miners:"

SECTION 1. Section two of said act is amended so as to read as follows:

It shall be the duty of each corporation, association, owner or owners of any quartz mine or mines in this State, where it becomes necessary to work such mines beyond the depth of 300 feet, and where the number of men employed therein daily shall be 12 or more, to proceed to sink another shaft or construct a tunnel so as to connect with the main working shaft of such mine, as a mode of escape from underground accident or otherwise. And all corporations, associations, owner or owners of mines as aforesaid, working at a greater depth than 300 feet, not having any other mode of egress than from the main shaft, shall proceed as herein provided. All boilers used for generating steam in and about any quartz mine, or place where mining operations are carried on; all steam machinery used in the working of any mine, and all mechanical appliances of whatever character, such as cables, reels, cages, ladders, together with the timbering of shafts, drifts and other underground workings, shall be kept in thorough order, and every owner or agent of such mines shall have all these appliances inspected by a competent person at least every three months.

SEC. 2. Section three of said act is hereby amended so as to read as follows:

When any corporation, association, owner or owners of any quartz mine in this State shall fail to provide for the proper egress as herein contemplated, and where any accident shall occur, or any miner working therein be hurt or injured, and from such injury might have escaped, if the second mode of egress had existed; or if any miner or other employe of such corporation, association, or owner be hurt or injured by reason of any defective boiler, machinery, or other mechanical appliances for the working of mines owned by such persons aforesaid, or by reason of the employment by such owners or agents of incompetent persons to handle such machinery, then such owners of the mines where the injuries shall have occurred, shall be liable to the person injured in all damages that may accrue by reason thereof, and an action at law in a Court of competent jurisdiction may be maintained against the owner or owners of such mine, which owners shall be jointly or severally liable for such damages. And where death shall ensue from injuries received from any negligence on the part of the owners thereof, by reason of their failure to comply with any of the provisions of this act, the heirs or relatives surviving the deceased may commence an action for the recovery of such damages, as provided by an act entitled an act requiring compensation for causing death by wrongful act, neglect, or default, approved April 26th, 1862.

SEC. 3. This act shall take effect from and after its passage.

Mr. Wasson has introduced the following:

Resolved by the Assembly, the Senate concurring, That the thanks of the people of California are due and are hereby extended to Mr. John Mackay, of Nevada, for the generous and patriotic aid rendered by him to the Commissioners of California, appointed by the Governor to represent the State at the Paris exposition of 1878, by his donation of $5,000 to defray the cost of transmitting a large and valuable collection of specimens from the mineral resources of California to the French capital.

Resolved, That the Governor be requested to forward to Mr. Mackay a certified copy of this resolution, under the seal of the State.

THE Board of Health have declared that portion of this city known as "Chinatown" to be a nuisance.

CATHOLIC PRIESTS in Russia are instructed by the Pope not to mix in the political agitation there.

JAMES GORDON BENNETT has been sued for libel by Dr. William Street, who claims $50,000 damages.

Tests of Steel and Iron.

Nitric acid will produce a black spot on steel; the darker the spot the harder the steel. Iron, on the contrary, remains bright if touched with nitric acid.

Good steel in its soft state has a curved fracture and a uniform gray luster; in its hard state a dull silvery uniform white. Cracks, threads or sparkling particles denote bad quality.

Good steel will not bear a white heat without falling to pieces, and will crumble under the hammer at a bright red heat, while at a middling heat it may he drawn out under the hammer to a fine point.

Care should be taken that before attempting to draw it out to a point, the fracture is not concave; and should it be so, the end should be filled to an obtuse point before operating. Steel should be drawn out to a fine point and plunged into cold water; the fractured point should scratch glass. To test its toughness, place a fragment on a block of cast-iron; if good, it may be driven by the blow of a hammer into the cast iron; if poor, it will crush under the hlow.

A soft tough iron, if broken gradually, gives long silky fibers of leaden gray hue, which twist together and cohere before breaking.

A medium even grain with fibers denotes good iron.

Badly refined iron gives a short, blackish fiher on fracture. A very fine grain denotes hard steely iron, likely to be cold-short and hard.

Coarse grain, with bright, crystallized fracture or discolored spots, denotes cold-short brittle iron, which works easily when heated and welds well. Cracks on the edge of a bar are indications of hot-short iron. Good iron is readily heated, is soft under the hammer and throws out few sparks.

Testing and Working Silver Ores.

The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope:

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or hlow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, trestment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Krochnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners' and prospectors' use. Price, post free, $2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 202 Sansome Street, San Francisco.

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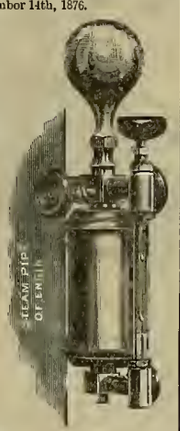

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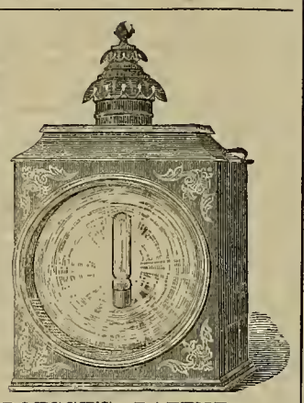
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DISSOLUTION OF COPARTNERSHIP.

The partnership heretofore existing between George Spaulding and Solon H. Williams, in the city and county of San Francisco, under the firm name of Spaulding & Williams, is this day dissolved by mutual consent.

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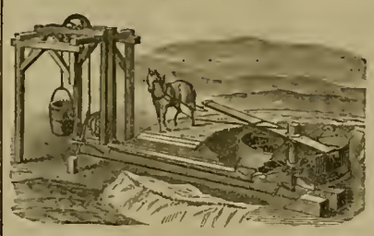

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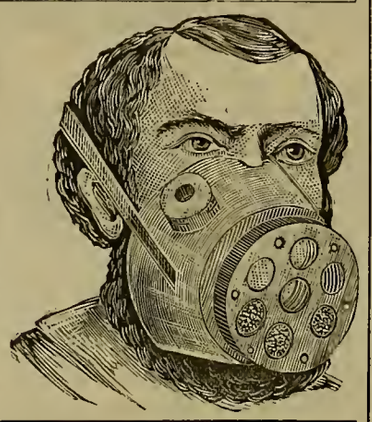

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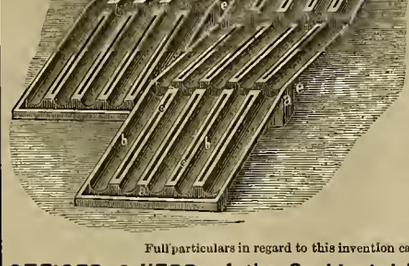
Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

STEIGER & KERR, of the Occidental Foundry, 137 First St., S. F.,

Who have the sole right of manufacturing this Riffle, and who will receive and attend to all orders.

Sanderson Bros. & Co.'s
BEST REFINED CAST-STEEL.

WARRANTED MOST SUPERIOR FOR DRILLS, HAMMERS, ETC.

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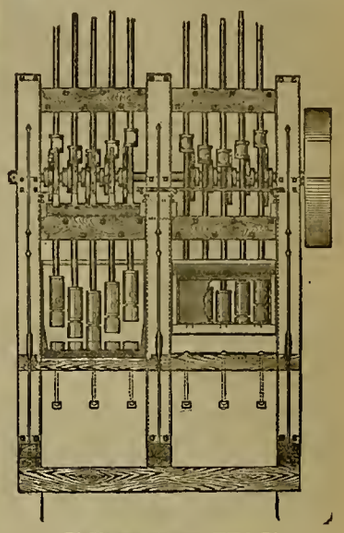

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FOR STAMP MILLS.

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We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,550.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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C. H. Aaron, Metallurgist. Wm. Irelan, Jr., Chemist and Assayer,

CONTINUED FROM PAGE 133.

will be connected and the mine speedily drained. This accomplished, the work of prospecting will be rapidly pushed forward.

ARIZONA.

ORO BLANCO ITEMS.—*Star:* Mr. S. S. Arnold, Superintendent of the Papago Chief mining company, is in the city. He reports the weather cold, with six inches of snow. Mr. Arnold has closed the contract with the Arivaca mill to deliver 100 tons of ore from the Longarina mine. The ore averages $200 per ton. The mill company guarantees 80% of the assay, and charges $25 per ton for turning ore into bullion. The mill company also pay for hauling the ore from the mine to the mill. The shaft in the Longarina is 100 ft deep, with two crosscuts and a drift. At least two tons of rich ore per day will he put on the dump. The contract has been let for work on the Sacramento and Papago Chief mines, which will be commenced at once. Work on the Peacock is progressing finely. The California is showing up well, and the large body of ore still continues. Gov. Stone, the President of the company, has brought out capital sufficient to make the most extensive developments on this property. A 100-ft shaft has just been completed on the Unthank mine. The Liberty mine will resume work in a few days. The money has been received to push developments. The Dorre mill and mining company are pushing their mill to completion, and are making considerable developments on their mines.

NELLIE JANES.—Is proving to be a bonanza. Two tunnels are being driven, all in ore, and from average assays taken for 23 days, across a five-ft vein, it was found that it contained $223 silver and 73% lead. Taking into consideration the vast amount of wood and water and the mammoth ledge, we predict, if this richness continues, that the Arizona bonanza is located in the Huachuas.

IRON CAP.—Yuma *Sentinel:* Down 170 ft in good pay ore. At the 100 level a drift has been run 60 ft; the ore assays $400 per ton in silver.

BLACK ROCK.—Is down 120 ft; the ore going $100 in silver.

PROMPTER.—*Citizen:* At the depth of 25 ft in a new shaft a body of rich carbonate and chloride ore has been discovered, which is reported to average over $300 per ton. Another shaft at a depth of 40 ft yields fine rock which averages about $75 per ton. Also a tuunel extending 40 ft, shows a superior quality of ore.

STOCKTON'S PASS.—This pass is 22 miles from Safford and 12 from Fort Grant. The first locations here were made a short time ago. The most important claims, as far as developed, are the Delaware and the Pioneer. The ledge is two and a half to three ft wide and traceable for from 1,800 to 1,900 ft without a break. The assays are simply marvelous, going $2,300 in silver and $722 in gold. The claims are situated on the north side and in plain sight of the main traveled road.

COLORADO.

EMMA.—Georgetown *Courier:* This claim is located on Democrat mountain. It had a mill run of first-class ore that returned 2,004 ounces in silver per ton, and 4,440 pounds second class that returned 956 ounces per ton. The back stope is 100 ft long, and with the exception of 15 ft it shows ore the whole distance, the ore vein ranging from one to four inches in thickness. The bottom of the shaft shows about an inch of copper pyrites that are worth $800 per ton, and four inches of quartz impregnated with rich silver ores, the value of which has not been ascertained. East of the whim shaft, in the 150 level, they are stoping on a vein of 500-ounce ore, from one to two inches in thickness. The ground worked out by these lessees has paid $300 per fathom, net. One stope 80 ft long, vein two and a half inches wide mills from 600 to 800 ounces per ton.

IDAHO.

MINING ITEMS.—*World*, Feb. 17: As soon as the Utah & Northern railroad is completed down Snake river, copper mining will give employment to a great many men. There are hundreds of miners there, some of the ledges being very wide, and 70% to 90% copper. They are near the line of the road, and in positions where they can be worked with but little expense. There are also copper mines on the Weiser. Those on Snake river are of sufficient extent to give Idaho a reputation abroad as a great field for this kind of mining as soon as the railroad is extended to them and they are worked. Mr. Ed. Carr, who returned from a trip across the Basin, informs us that a large body of ore, that will mill $100 or more to the ton, is being opened up in the Ebenezer, on Canyon creek. While at Quartzburg he visited the Justice, which, he says, is turning out good ore. The Montana has struck a bonanza. Over $17,000 worth of ore has been taken out since the first of January. It is working a small force of only four men, and grows richer. It is to-day among the richest mining properties on the coast.

MONTANA.

ALICE.—Butte *Miner*, Feb. 24: The second and third levels are prospected by drifts and crosscuts, and ore is being extracted across the full width of the vein, which is not less than 30 ft wide. On the fourth and fifth levels the ore body is improving in extent and richness, and the water has ceased to occasion any trouble. Fifty tons of ore are hoisted daily, 20 tons being sent to the mill for reduction and the remainder dumped as second-class ore. The ore worked mills $80, and the daily bullion output is about $1,000.

MAGNA CHARTA —Has resumed a contract to complete the tunnel the full length of the claim, and is being run in on the side of the ledge. When it is finished a series of crosscuts will be run to the vein and ore will he extracted and hoed on the dump to await the completion of the new Alice mill.

GAGNON.—The main shaft is down 225 ft, or 75 ft below the third level. From this point a crosscut will be run to the vein and a level started, which will prove that the value of the Gagnon, like that of other great properties of the camp, increases as depth is attained. But four men in one part of the mine have been employed in extracting ore, and the result of their labors has averaged 100 tons per week.

BURNETT.—The vein is six ft wide, low-grade ore; the daily output is about 12 tons.

NEW MEXICO.

GRANT COUNTY ITEMS.—*Herald*, Feb. 14: On the Copper King an 18-inch vein assaying 700 ounces has been struck. Mr. Williams has paying ore on four claims and five ft of good ore on the Copper Queen. Messrs. Lambert, Chick & May have commenced operations on the Bonanza, and discovered three claims on Silver creek, showing from one to four ft solid metal on the surface. Mr. Eddy shows 400-ounce ore at 10 ft from the surface on H. E. M. No. 2 Silver Bar. Mr. Miller's claim H. E. M. No. 1 Silver Bar shows metal the entire length of the drift. The Galveston Co. have some good mines and are prosecuting work with energy. The mine on Duck creek shows 1,000-ounce ore. The California Co. will commence operations on Silver creek. May & Co. will soon have their smelter in full blast. They are developing their claim, showing rich ore and plenty of it. Mr. Johnson shows rich ore on two claims. On the Silver Bar mine it is very good drifting, nothing to work in but solid metal. Twenty-four pounds of this ore gave returns of one and a half ounces of silver. Six different assays on the same ore run from 900 to 7,000 ounces.

NEW ISSUE.—Silver City *Herald:* The vein is 30 ft wide carrying iron pyrites with clean galena and chloride of silver. Assays run 30 ounces per ton. There are on the dump 200 tons of ore assorted and 150 not assorted. A tunnel is being driven to connect with the main shaft.

OREGON.

MINING ITEMS.—*Sentinel*, Feb. 11: Thawing at Sterling and piping resumed with a fair water supply. Miners in Josephine county are generally retarded in their operations by the freeze. The Applegate Gravel company are still busy with a flush head of water and working in good ground. Geo. McKnight, of Foots Creek, has been sojourning in town for his health. He reports the miners all very busy in that camp. The English company at Galice creek are now piping with about 800 inches of water, everything working satisfactorily. Miners in the Willow Springs camp are complaining of failing water, the freeze having locked up the springs for the present. Blue Gravel company is using about 600 inches of water, and prospects quite flattering. A few warm days will increase their water supply. The Squaw Lake company are now busy driving dirt through the flume again. Ditch all clear and no more interruptions looked for. The company is working in rich ground. From Mr. Chenoweth, just returned from the East, we learn that there is a good prospect that all the money necessary to complete the Grave Creek ditch will be raised, and that it will be pushed to completion next summer. The ditch will be 21 miles long, and will probably require an expenditure of $75,000. From our knowledge of this locality we have no hesitation in predicting that when this work is finished the property will be the most valuable in southern Oregon.

UTAH.

ELKHORN DISTRICT.—Salt Lake *Tribune:* Among the promising mining districts in the Territory is the Elkhorn, which adjoins Blue Ledge on the east, and distant from Park City about six miles. This district, from the character of the ore and its accessibility, is bound to attract the attention of capitalists. Specimens from the El Dorado and Mohawk assayed $90 in silver and $12 in gold. Some select samples have been found on the hill going as high as $75,000. A double-compartment shaft is sunk 55 ft, exposing a well-defined vein of free-milling ore five ft in width. The Crawford is situated half a mile north, and the ore assays from $27.50 to $32 in silver. The Eastern Cross and La Belle are down 15 ft and show good veins, assaying from $18 to $340 in silver.

AMERICAN FORK NOTES.—The Miller will start up again this season. The King of the West is making daily shipments. The Excelsior has a promising vein three ft wide. Character of ore chloride. There are several mines working in Silver Lake district. Shipments are being made from this district. The Pittsburg has about 300 tons on the dump ready for shipment. They are taking out from 10 to 15 tons daily. In the Russler ore worth $87 per ton has just been struck in the south drift. The Hidden Treasure main tunnel is in 200 ft on the vein, which carries bromide of silver six inches wide, and will assay from $100 to $300 per ton. Not far from this mine is situated the far-famed Rebel, which has produced over 5,000 tons of heavy lead ores that have averaged 60% lead and 45 ounces silver.

Those Tailings.

EDITORS PRESS:—Much as I should prefer to discuss points of general interest advertsd to in my communication of the 14th inst., to which Mr. Kustel has not replied, yet the attitude in which I am placed by that gentleman's letter in your issue of the 21st compels me, however unwillingly, to recur to this branch of the subject.

In giving the assay of what I believed to be Mr. Kustel's tailings I simply sought to answer in the shortest way an unwarrantable and arrogant assertion, while feeling that the gentleman's metallurgical reputation was too well established to be injured by sven his own inconsiderate verdict.

Mr. Kustel knows—must, as an experienced operator, know—that cases occur in which it *pays* better to leave $18 in the tailings than to leave less, as well as cases in which that amount in the tailings would indicate the extraction of 99% of the original content.

When I first took these works I was informed hy msn who lived in Melrose when Mr. Kustel worked, and live there still, that his pile of tailings contained $17 per ton in gold, and that a number of tons had been sold which the purchaser stated contained from $15 to $40 per ton in gold and silver.

Now it is no concern of mins if an operator leaves $28, or more, in his tailings, nor would I take on myself to say that he did not understand his business, at least without knowing the original richness of the ors or the circumstances under which he worked; but when that operator proclaims, from the dizzy hight of imagined superiority, that Deetken and I, and many others whom I consider to he his equals, who acknowledge to having left $18 per ton in certain cases, do not understand our business, I think it uot impertinent to the matter to show that he stands self-condemned; nor has Mr. Kustel yet *denied* that those wsre his tailings, nor that he has ever left so much in his tailings.

I find on further inquiry that, hesides Mr. Kustel, his son and Mr. Hofmann worked gold sulphurets here, and no one else. Mr. Oglehy worked gold quartz, not, however, hy chlorination, and his tailings (in sacks) contain only about $15 per ton. Mr. Stewart worked copper ore; his tailings contain gold, hut are very distinct. This fills the hill, making me the fifth since Mr. Kustel, as he says, and leaves the question of the production of those tailings hetween Mr. Kustel, his son and Mr. Hofmann.

The reason that the tailings were attributed to Mr. Kustel is that he was a constant visitor to the works, and was understood to be the superintendent all that time. All this is according to my iuformation. I enter into these particulars, of little public interest, hecause Mr. Kustel appears to charge me with "willingly misrepresenting," which I never do; neither am I in the habit of "blowing," as I understand that somewhat vague and not very elegant expression, and I think that he who should accuse me of either, would, in the eyes of those who know me, accuse himself of want of sense, or want of veracity.

I have now said all that I *wish* to say about this matter, and I sincerely hope that I shall not he compelled to further puncture the huhble of a self-constituted metallurgical oracle.

C. H. AARON.

Pacific Reduction Works, Feh. 23, 1880.

THIRTY-SIX miuing companies were recently stricken from the San Francisco Stock Board list, on account of non-payment of dues and other causes.

The Hofmann Process.

EDITORS PRESS:—The description of my improvsment on Plattuer's process for treating auriferous silverous and rehellious gold-hearing sulphurets, which you copied in your paper from Mr. Kustel's hook ("Roasting of Gold and Silver Ores," second edition), caused a discussion in which two gentlemen attacked the merits of my improvement, not in the manner of an impartial critic, hut in a way which shows their malicious intent to profit by attacking others. Both of these gentlemen ars engaged in working these kind of orss, to which my improvement relates, and their desire to make free use of the same is apparent.

I did not taks an active part in the discussion as I am opposed to newspaper controversies, especially when the parties with whom I havs to deal cannot argue by reason, hut put the whole force of their argument in personal attacks and sneers, as your two corrspondents did. If I, however, ask you to grant thess lines a space in your valuahls papsr, it is with the intention of explaining mattsrs and to bring this unpleasant controversy to an snd.

The concentrations of ths Colorado No. 2 G. & S. M. Co., of Monitor, Alpine county, range in value from $250 to $1,700 and $1,800 per ton, witb over 40% of the amount in gold. Owing to its refractory nature the ore never had heen worked successfully, and this valuahle property lay idle for many years. In March, 1879, when I undertook to work these concentrations, I soon found that hy the common chlorination process it was impossihle to extract more than 50% of ths gold, notwithstanding a vsry careful roasting. I therefors prepared the sulphurets in a different way, viz, roasting with salt and removiug hy leaching the hase metal chlorides and the chloride of silver hefore subjecting ths ore to the action of the chlorine gas, and was gratified with a very satisfactory result. This preparation of the ore for the chlorination process is new, and never was used hefore. Its value is proved hy the present prosperous condition of thc Colorado No. 2. It is immaterial by which chemicals this operation is performsd. It is sufficient to have the chlorides removed bsfore subjecting the ore to Plattner's process. Ths view of your correspondent, "Metallurgist," is correct; and Mr. Aaron's rsmarks about "re-treating tailings" and "coupling of well-known processes like cars," are therefore not pertinent and not applicahls to my improvement.

Messrs. Deetken and Aaron douht the advantage of my method; hoth tried it, and, as they say, without success. Tbis hsing the case, I am at a loss to understand ths rsason why those two gentlemen exert thsmselves so much. If my improvement is worthless, the "frivolous patsnt cannot trammel metallurgy" so much as to make it worth while for Mr. Aaron to hreak a lance in protection of his "adopted profession." He would serve the cause much more hy commencing war against that army of pretenders, recruited from all imaginahle trades, who, working as common hands for a short time in reduction works, adopt metallurgy as thsir profession, and trammel thereby the progress of metallurgy upon this coast to a great extent.

If Mr. Aaron in several instances terms my improvement a "suggestion of common sense," I do not take any offence at it, as many very valuahle improvements, after they are made known appear like common sense suggsstions; hut surely his expression is no compliment to himself, as he did not have himself such an "ohvious suggestion of common sense," and was ohliged to find out in a round-about way how I treated the Monitor sulphurets. By his remark: "As I seem to he the only person, hesides Mr. Knstel, who has treated gold-hearing sulphurets at thess works," etc., I have to conclude that he is one of the parties who worked gold and silver-bearing sulphurets at the Melrose works last spring, and encountered considerahle difficulties. Hearing of my success, one of the partners, provided with a muffls and crucihles, accompanied, as traveling assayer, a San Francisco capitalist, who came up to Monitor last May to look at the Colorado mine. Though I invited him to the use of the assay office, he did not make one assay, hut was during the whole time of his stay very industriously trying to find out how I treated the concentrations. Having received no information from Mr. Allen, the assayer, he went to my mill-hands when off shift, and other persons in town, till he obtained the main points. Notwithstanding my refusal of his request to visit the works, he went in through a back-door, where I found him in front of the tanks.

Having obtained in this manner, the knowledge of my improvement hefore it was puhlished, and very likely made use of it, Mr. Aaron finds it now very annoying to he checked hy a patent, hence his attack.

In one of his letters, I think in bis first, Mr. Aaron remarks that I applied steam in roasting. It is very singular—and there is where he gives himself away—how he came to the knowledge of this fact, as it had not heen mentioned in the publications referring to my improvement.

This may suffice. I purposely avoided asking any questions, and therefore neither expect nor wish an answer. Let the controversy come to an end. Neither of these gentlemen is "judge and jury" in this case.

OTTOKAR HOFMANN.

Genoa, Nev., Feb. 19th.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING FEBRUARY 17, 1880.

224,606.—HAND STAMP—G. E. Emerson, S. F.
224,677.—TRUSS BRIDGE—R. W. Gorrill, S. F.
224,717.—GALVANIC BELT—C. Norwood, Winters, Cal.
224,560.—HORSE HITCHING DEVICE—R Seiders, S. F.
224,740.—TOASTING IRON—C. G. Stafford, Eureka, Cal.
224,742.—FIRE-ARM—A Swingle, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

News in Brief.

INDIAN affairs in Nebraska are quist.

THE Hudson river is now frse from ice.

THE alliance hetween Peru and Bolivia is off.

THE Utah Lsgislature adjourned Saturday last.

THE Prussian Diet has been adjourned by royal order.

ANOTHER insurgent plot has been discovered in Cuba.

THE severe weatber continuss in British Columhia.

GREECE has recognized the independence of Roumania.

THE distress in Ireland is again said to bs on the increass.

POMEROY COLLEY bas besn appointed Governor of Natal.

THE Czar wishes a state of siege to he proclaimed over Russia.

BARON VON SCHELL, Russian Privy Councilor, has committed suicide.

MANY wealthy Californians are emharking in business in New York.

THE horing of the St. Gothard tunnel will be finished in twelve days.

GENERAL LONGSTREET pronounces for Grant over all other candidates.

AN effort is being made in Washington to rsvive the duty on quinine.

THE Democratic National Convention will bs held at Cincinnati, June 22d.

EIGHT or ten persons are dying daily at Rio de Janeiro from yellow fever.

ADVICES from Tripoli state that 1,500 houses have heen destroyed hy floods.

THE uet earnings of ths Illinois Central rail road during 1879 wsrs $4,207,764.

IT is again reported from Glasgow tbat diamonds ars successfully made there.

THE Nihilists of St. Petershurg threaten to fire the Capital on ths 3d of March.

THE steamer *Gem* was recently sunk in Fraser river, having been cut through hy ics.

THE Mansion House Relief Committee's contrihutions to dats amount to £74,801.

IT is not improhahls that Gen. Grant will return from Mexico hy way of California.

GEN. GRANT and party arrived at Vera Cruz on the 18th inst., after a smooth voyage.

THERE is talk among San Francisco business men of rsviving the Committee of Safety.

THE Italian government offers prizes for vineyards raised from grafts of American vines.

THE Academy of Forest Culturs at Moscow, Russia, was destroyed hy fire Saturday last.

THE Geographical Society at Rome has conferred a gold medal upon Prof. Nordensjold.

A GENUINE Mormon colony has been discovered in Kentucky, numhsring ahout 50 persons.

AT Valparaiso recently twenty persons wsre killed hy an explosion of shells in the arsenal.

COLBY, ths murdercr of Harry Williams, at Santa Cruz, has heen respited by the Governor.

THE total number of persons killed hy the Winter Palace explosion at St. Pstershurg is ten.

THE Marysville Woolen Mills have closed, throwing about seventy persons out of employment.

New Incorporations.

The following companies have iucorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

NEVADA LUMBER CO.—Object: To operate in California and Nevada. Capital, $1,000,000. Directors—W. S. Hobart, A. Hayward, C. T. Bridge, W. E. Sell and S. H. Marlette.

BELDEN M. & M. CO.—Object: To mine in Nevada. Capital, $10,000,000. Trustees—G. W. Terrill, Thomas Holt, George L. Bradley, F. M. Luce and W. F. Belding.

HOLMES M. CO.—Object: To mine in Columbus district, Esmeralda county, Nevada. Capital, $10,000,000. Directors—Alsop J. Holmes, Gardner T. Lawton, Calvin G. Strong, William H. Sharp and Richard W. Heath.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

CHEW JACKSON'S BEST Sweet Navy Tobacco

Mining and Other Companies.

Atlanta Mining Company.—Location of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth [5th] day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh [27th] day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—room 7, No. 420 Montgomery St., San Francisco, California.

California and Oregon Land Company.—Principal place of business, San Francisco, California. Location of works, Lake and other counties, Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 5th day of February, 1880, an assessment of Thirty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary.

Any stock upon which this assessment shall remain unpaid on the 15th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 18th day of April, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, 318 Pine street, room 6, San Francisco, California.

Cataract and Wide West Gravel Mining Company. Principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 2nd day of February, 1880, an assessment (No. 2) of Twenty-five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 26½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 8th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 29th day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. B. LAKE, Secretary.

Office, room 18, 26½ Kearny Street, San Francisco Cal.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 40) levied on the Twenty-fourth day of December, 1870, the several amounts set opposite the names of the respectives shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Ashby, Mark T	7	5000	$500 00
Ashby, Mark T	16	500	50 00
Ashby, Mark T	19	1200	120 00
Drew, J P	254	500	50 00
Drew, J P	255	300	30 00
Drew, J P	256	200	20 00
Drew, J P	257	500	50 00
Drew, J P	258	250	25 00
Dennis, John C	249	440	44 00
Deunis, Delia H	250	500	50 00
Dennis, Dolia H	251	250	25 00
Plaisted, F A	90	300	30 00
Plaisted, F A	91	100	10 00
Plaisted, F A	92	100	10 00
Plaisted, Thankful P	80	500	50 00
Prince, Chas	222	100	10 00
Prince, Chas	223	100	10 00
Prince, Chas	224	50	5 00

Also, 510 shares of the old issue, equal to 2550 shares of the new issue of the capital stock of the said Gover Mining and Milling Company.

Names.	No. of Certificate.	Old No. Shares.	No. New Shares.	Amount
Dennis, E	174	10	50	$5 00
Dennis, Ezekiel	271	10	50	5 00
Foy, J K	390	50	250	25 00
Foy, J K	490	50	250	25 00
Foy, J K	034	10	50	5 00
Foy, J K	635	10	50	5 00
Foy, J K	030	10	50	5 00
Foy, J K	637	10	50	5 00
Foy, J K	050	00	300	30 00
Marr, C H	018	40	200	20 00
Skinner, E C	441	100	500	50 00
Skinner, E C	619	100	500	50 00
Skinner, E C	020	50	250	25 00

And in accordance with law and an order of the Board of Directors, made on the Twenty-fourth day of December, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Monday, the First day of March, 1880, at the hour of one o'clock P. M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

W. O. WILSON, Secretary.

Office, room 8, No. 402 Front street, San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Gover Mining and Milling Company is postponed to Monday, the eighth day of March, 1880, at 12 o'clock M.

W. O. WILSON, Secretary.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) levied on the 14th day of January, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
J R Robbins, Trustee	13	500	$50 00
J R Robbins, Trustee	17	63	6 80
J R Robbins, Trustee	61	1000	100 00
J R Robbins, Trustee	65	333	33 30
J G Whitney, Trustee	39	1000	100 00
A Hinds	57	1000	100 00
A Hinds	58	1167	116 70
A Hinds	194	500	50 00
A Hinds	198	100	10 00
J K Cooper, Trustee	106	100	10 00
J K Cooper, Trustee	107	100	10 00
J K Cooper, Trustee	198	100	10 00
C A Hunt, Trustee	117	8334	833 40
M Van S Rice	200	500	50 00
M Van S Rice	201	500	50 00
M Van S Rice	202	500	50 00
M Van S Rice	203	500	50 00
T L Bibbins, Trustee	99	100	10 00
T L Bibbins, Trustee	100	100	10 00
T L Bibbins, Trustee	101	100	10 00
T L Bibbins, Trustee	103	50	5 00
T L Bibbins, Trustee	120	100	10 00
T L Bibbins, Trustee	121	100	10 00
T L Bibbins, Trustee	122	100	10 00
T L Bibbins, Trustee	123	100	10 00
T L Bibbins, Trustee	124	100	10 00
T L Bibbins, Trustee	125	500	50 00
T L Bibbins, Trustee	132	1000	100 00
T L Bibbins, Trustee	133	1000	100 00
T L Bibbins, Trustee	134	1000	100 00
T L Bibbins, Trustee	136	1000	100 00
T L Bibbins, Trustee	142	450	45 00
T L Bibbins, Trustee	146	100	10 00
T L Bibbins, Trustee	147	50	5 00
T L Bibbins, Trustee	148	50	5 00
T L Bibbins, Trustee	150	500	50 00
T L Bibbins, Trustee	157	100	10 00
T L Bibbins, Trustee	162	100	10 00
T L Bibbins, Trustee	163	100	10 00
T L Bibbins, Trustee	169	500	50 00
T L Bibbins, Trustee	170	500	50 00
T L Bibbins, Trustee	174	100	10 00
T L Bibbins, Trustee	176	50	5 00
T L Bibbins, Trustee	181	100	10 00
T L Bibbins, Trustee	185	100	10 00
T L Bibbins, Trustee	189	50	5 00
T L Bibbins, Trustee	213	100	10 00
T L Bibbins, Trustee	216	500	50 00
T L Bibbins, Trustee	217	500	50 00
T L Bibbins, Trustee	218	500	50 00
T L Bibbins, Trustee	219	3000	300 00
T L Bibbins, Trustee	220	500	50 00
T L Bibbins, Trustee	221	250	25 00
T L Bibbins, Trustee	222	250	25 00
T L Bibbins, Trustee	223	100	10 00
T L Bibbins, Trustee	232	100	10 00
T L Bibbins, Trustee	225	100	10 00
T L Bibbins, Trustee	226	100	10 00
T L Bibbins, Trustee	227	100	10 00
T L Bibbins, Trustee	228	100	10 00
T L Bibbins, Trustee	229	100	10 00
T L Bibbins, Trustee	230	100	10 00
T L Bibbins, Trustee	231	100	10 00
T L Bibbins, Trustee	233	500	50 00
T L Bibbins, Trustee	234	500	50 00
T L Bibbins, Trustee	235	500	50 00
T L Bibbins, Trustee	236	500	50 00
T L Bibbins, Trustee	237	50	5 00
T L Bibbins, Trustee	254	20	2 00
T L Bibbins, Trustee	262	100	10 00
T L Bibbins, Trustee	263	100	10 00
T L Bibbins, Trustee	264	100	10 00
T L Bibbins, Trustee	265	100	10 00
T L Bibbins, Trustee	266	100	10 00
T L Bibbins, Trustee	267	100	10 00
T L Bibbins, Trustee	268	100	10 00
T L Bibbins, Trustee	269	100	10 00
T L Bibbins, Trustee	270	50	5 00
T L Bibbins, Trustee	271	50	5 00
T L Bibbins, Trustee	272	50	5 00
T L Bibbins, Trustee	273	50	5 00
T L Bibbins, Trustee	293	1000	100 00
T L Bibbins, Trustee	378	97	9 70
T L Bibbins, Trustee	383	150	15 00
T L Bibbins, Trustee	384	50	5 00
T L Bibbins, Trustee	398	50	5 00
T L Bibbins, Trustee	424	100	10 00
T L Bibbins, Trustee	425	100	10 00
T L Bibbins, Trustee	426	100	10 00
T L Bibbins, Trustee	427	100	10 00
T L Bibbins, Trustee	428	100	10 00
T L Bibbins, Trustee	429	100	10 00
T L Bibbins, Trustee	430	100	10 00
T L Bibbins, Trustee	431	100	10 00
T L Bibbins, Trustee	436	1000	100 00
O R Cottrell, Trustee	144	1000	100 00
G R Cottrell, Trustee	160	500	50 00
J Colman, Trustee	354	100	10 00
M French, Trustee	346	1000	100 00
H R Taylor, Trustee	340	50	5 00
Jos F Nounnan, Trustee	361	100	10 00
Jos F Nounnan, Trustee	360	100	10 00
J Griswold, Trustee	441	6000	600 00
Unknown	247	30	3 00
Unknown	249	8	80
Unknown	251	65	6 50
Unknown	253	30	3 00
Unknown	255	30	3 00
Unknown	250	42	4 20
W Townsend, Trustee	410	1000	100 00
W Townsend, Trustee	411	500	50 00
W Townsend, Trustee	412	500	50 00
J M Hinkle, Trustee	360	1700	170 00
T A Wright, Trustee	294	1000	100 00
T A Wright, Trustee	370	300	30 00
T A Wright, Trustee	307	26	2 60
T A Wright, Trustee	309	1000	100 00
J R Robbins	357	20	2 00
G L Waters, Trustee	419	200	20 00
W J Gwynn	402	1000	100 00
Geo O McMullin, Trustee	421	500	50 00
M K Lauden, Trustee	287	250	25 00
M K Lauden, Trustee	288	250	25 00
M K Lauden, Trustee	300	1000	100 00
M K Lauden, Trustee	301	1000	100 00
M K Lauden, Trustee	302	1000	100 00
M K Lauden, Trustee	303	1000	100 00
M K Lauden, Trustee	304	1000	100 00
E A Richardson, Trustee	315	500	50 00
E A Richardson, Trustee	310	500	50 00
E A Richardson, Trustee	317	500	50 00
E A Richardson, Trustee	318	500	50 00
E A Richardson, Trustee	319	500	50 00
E A Richardson, Trustee	320	500	50 00
E A Richardson, Trustee	321	500	50 00
E A Richardson, Trustee	322	500	50 00
E A Richardson, Trustee	323	500	50 00
E A Richardson, Trustee	324	500	50 00
E A Richardson, Trustee	325	500	50 00
E A Richardson, Trustee	326	500	50 00
E A Richardson, Trustee	327	500	50 00
E A Richardson, Trustee	328	500	50 00
E A Richardson, Trustee	329	500	50 00
E A Richardson, Trustee	330	500	50 00
A H Todd & Co., Trustee	418	200	20 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 314 Bush street, San Francisco, on Thursday, the 11th day of March, 1880, at the hour of —o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

T. L. BIBBINS, Secretary.

Office—314 Bush street, San Francisco, California.

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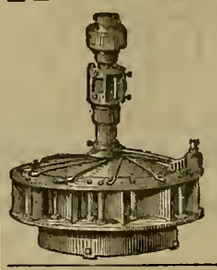

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OFFICE OF THE

Original Gold Hill Gold and Silver Mining Company,

Gold Hill Mining District, Storey County, Nevada.

NOTICE!

A special meeting of the stockholders of the Original Gold Hill Gold and Silver Mining Company will be held at the office of the Company, rooms 3 and 4, second floor, 309 California street, San Francisco, on Monday, the 15th day of March, 1880, at 2 o'clock P. M., for the purpose of disposing of the stock belonging to the Company, and such other business as may legally come before said meeting. Transfer books will be closed on Saturday, the 6th day of March, 1880, at 3 o'clock P. M.

J. M. BUFFINGTON, Secretary.

W. E. CHAMBERLAIN, JR. THOS. A. ROBINSON

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DIVIDEND NOTICE.

Office of the

EUREKA CONSOLIDATED MINING CO.,

Room 37, Nevada Block, San Francisco,

February 14th, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 52) of Thirty cents per share was declared, payable on Friday, February 20th, 1880. Transfer books closed until the 21st instant.

P. JACOBUS, Ass't Secretary.

STOCKHOLDERS MEETING.

The annual meeting of the stockholders of the AMERICAN MINING AND DREDGING COMPANY for the election of Directors to serve during the ensuing year, will be held in the office of the Company, No. 220 Sansome street, San Francisco, California, at 12 M., on Monday, March 8, 1880.

E. MOREAU, Secretary.

February 19th, 1880.

Mining Books.

Orders for Mining and Scientific Books in general will be supplied through this office at published rates.

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SHIP WORK. Ship and Steam Capstains, Steam Winches, Air and Circulating Pumps, made after the most approved plans.

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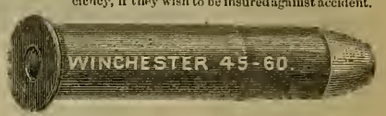

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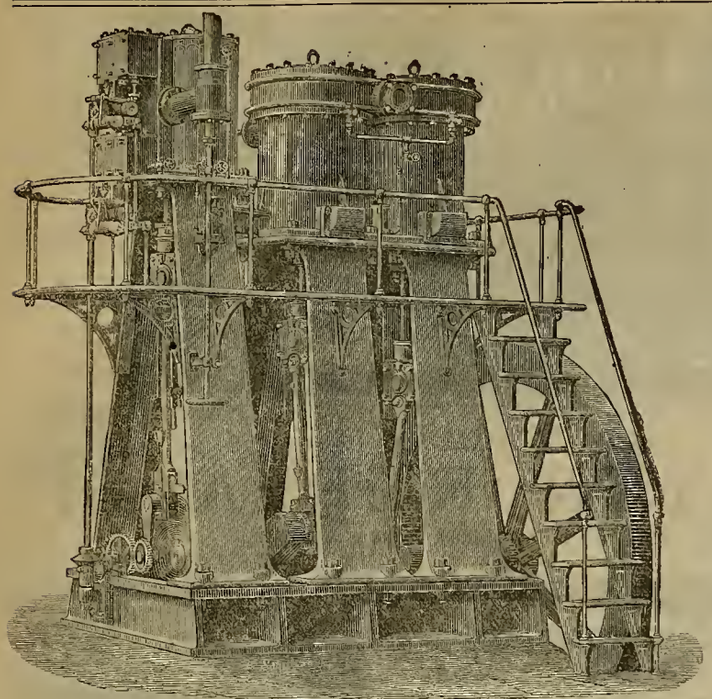

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Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

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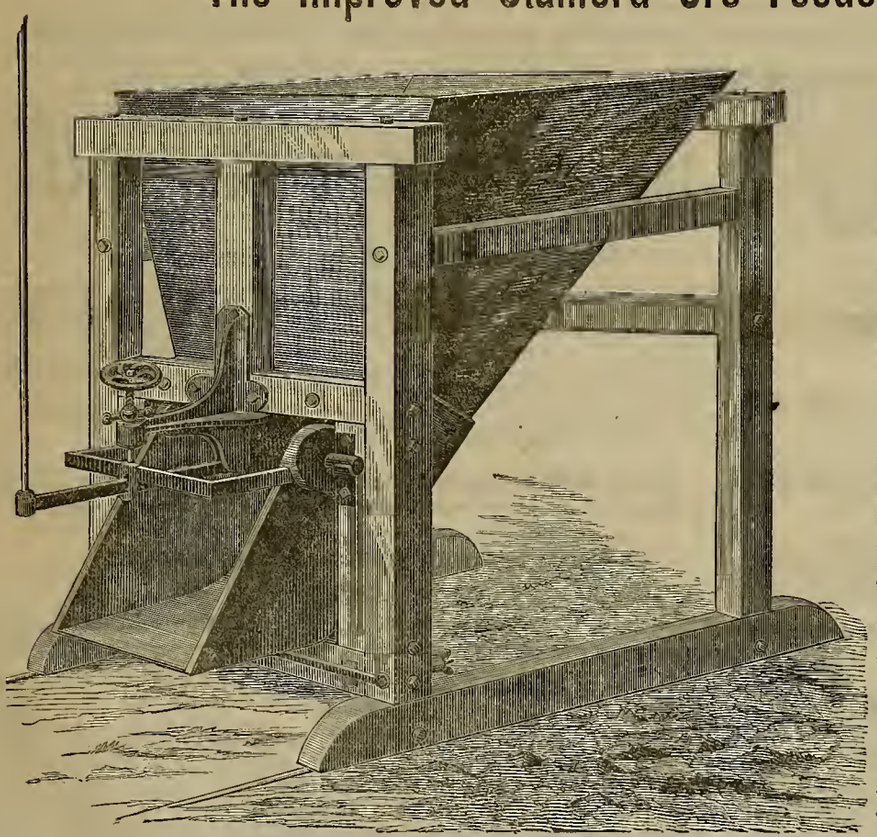

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The STANFORD and CHALLENGE Feeders, made by me, have superseded the Victor Ore Feeders, furnished by E. T. Steen, in the Alexander mill, J. B. Cooper, President, office, Safe Deposit Building, S. F. By special permission I am enabled to refer interested parties to Mr. Cooper.

In this connection I will state that I will give $50 to be shown up to this date one of the Eclipse Ore Feeders, manufactured by Prescott, Scott & Co., of the Union Iron Works, which is in general successful practical operation at any quartz mill on this coast.

I have made a specialty of manufacturing ORE FEEDERS, and know which will give satisfaction for steady work. This Improved

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Which I sell for

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Will beat any one in use—always excepting the CHALLENGE, which is

The Best of all.

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Iron, Steel and Galvanized Wire

Of all sizes on hand or made to order.

Barbed Fence Wire.

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Rock Breaker and Cornish Rolls Combined.

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Furnaces for chloridizing and desulphurizing ores.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MARCH 6, 1880.

VOLUME XL Number 10.

The Direct Aid of Mining to Other Industries.

There are but few who ever consider how great an influence a profitable mine possesses over the industries of its immediate vicinity, nor how far that influence extends over the country. The discovery of a good paying ledge in a district that has never attained any notoriety in the world; that has never been cultivated to even a tithe of its capabilities of production; whose inhabitants have been sparsely scattered over its whole extent; in which for years past there has been no perceptible advance in wealth or population; and which, while the world at large has been progressing in knowledge, power and wealth, has remained positively stationary or has actually retrograded—gives to that district a marked and distinctive character, and brings it suddenly forward into prominence. It brings into it an active and energetic population who are intent upon finding other ledges and whose researches in this direction will still further add to its renown. It brings there mechanics whose skill is called into requisition in the erection of buildings, opening mines and all branches of skilled labor that a growing community absolutely needs. It produces a market for the productions of the neighboring farmers and creates a wider sphere of land cultivation. The valleys near it, and the hillsides which surround it, may never have produced aught save scanty herbage for pasturage. Under the progress which such a mine stimulates, these waste lands are made to yield bountiful crops, and instead of presenting features of semi-sterility and seeming desolation, they become scenes of prolific verdure. It calls into activity labor that has been dormant, and finds ample employment for a large retinue of sturdy workers, in all degrees of muscular toil. The wood-cutter, the charcoal-burner, the teamster, the hands above and underground, all find in the development of the mine a call for their services. The foundryman, powder and fuse makers, rolling mills and producers of steel, tool-makers and dealers in general supplies receive an impetus in their respective callings, by the orders for supplying the demands at the mine. Transporters from the mule team and stage, to the railroad, canal and steamers, obtain profits by the freight that passes through their hands and the passengers that travel upon their lines. One good mine extends the circle of labor through all the ramifications of society; it even calls upon other classes of mines than its own for a portion of their products. If it is producing bullion it requires iron, lead, copper, zinc and quicksilver in the construction of its appliances for mining and reduction of its ores; if it is producing any of these other metals, it needs the bullion for coinage of the standards of value in the sale and transfer of its own output.

Without the product of the mines agriculture could not have been extended to its present vast proportions. For without its metallic implements its efforts would be crude and limited. Manufactories could not exist if mines had never yielded the metals used in their machinery. The arts and sciences would never have beautified or enlightened the world were there no mines to furnish the material adapted to the construction of their instruments.

There is no industry that is not indebted to mining for its success and advancement. The tiller of the soil may gather his harvests, but his labors would be unavailing and his reaping be light were he not aided by the product of the mine. Commerce could not spread its sails to the breeze of every clime and return laden with the products of distant lands in exchange for the cargoes which it bore to them, had not mining antecedad its movements. To whatever point of labor we may turn we cannot fail to witness its undeniable obligations to the use of the product of the mines.

A Sanitary Suggestion.

It is the acknowledged duty of the Government to look after the welfare of citizens in circumstances where, from the nature of the case, they are not in position to look after it themselves.

There is one of these cases where the State can, we think, make a very good move in this direction, and that is in making arrangements for the examination of the drinking water supplied to the large cities and towns of the State, and to public institutions.

This matter has not been entirely neglected, as the State Board of Health have, from time to time, had analysis made of various questionable drinking water. At the same time water analysis, from their nature, occupy so much time and attention in being conducted, that the carrying out of a single analysis of this kind is an expensive operation. Nevertheless, if the analyses are required in greater numbers, it is also not difficult to so arrange the operation that quite a number can be carried on nearly simultaneously, with the outlay of but little extra time or labor. Hence, if it is possible to have a system of this kind, quite a number may be made for comparatively little cost.

The State University, at Berkeley, is admirably arranged for conducting such work. The chemical laboratories are well equipped and it possesses a corps of capable chemists. It is not to be expected that these instructors would have time enough to do the work required, but there are graduates of the College of Chemistry capable of performing the greater portion of the work, and by the labor of one of these, directed and assisted by the instructors, the work could be well done. In this way the only expense would be the compensation for the labor. The apparatus and supplies would be furnished by the University, and hence it would be necessary that the Prof. of Chemistry should assume general supervision of the work. This we are certain he would willingly do. If such an arrangement were made but for one year, we think that the satisfaction of having the water supplies of the State examined from time to time during the year would be ample compensation for the small expense incurred.

The selection of the waters to be examined would be naturally left to the State Board of Health, and we have no doubt that they would gladly assume the responsibility. The expense of transporting and collecting water could also be included in the appropriation. We commend consideration of this question to the Legislature.

The New Regents of the University.

The Governor has appointed as Regents of the State University: Wm. Ashburner, vice Bowie, term expired; J. Bidwell, vice Archer, term expired; B. B. Redding, vice F. M. Pixley, resigned.

We are very glad to see Governor Perkins make such good selections for these important positions. The Regents of the University receive no salary, but as the board have the entire management and control of this important institution, the position is an honorary one.

The selection of Mr. Ashburner is eminently proper, the gentleman being peculiarly fitted by education and experience to assist in the deliberations of the board. He is familiar with the workings of the institution and knows its needs. The Governor was no doubt cognizant of the fact that there was not in the board a representative of the great mining interests of the State, and selected Mr. Ashburner as such. It is only a matter of surprise that such an appointment was not made before.

Mr. B. B. Redding is land agent of the C. P. R. R., and is an energetic and intelligent gentleman, who has the best interests of this State at heart. Mr. Redding has written much on topics relative to the climate and the agricultural resources of California. He is one of the State Fish Commissioners, in which capacity he has done a great deal towards increasing our fish food supply, bringing intelligent and unceasing labor to bear on the work. He is a genial, well-informed gentleman, eminently fitted to have a seat in the Board of Regents.

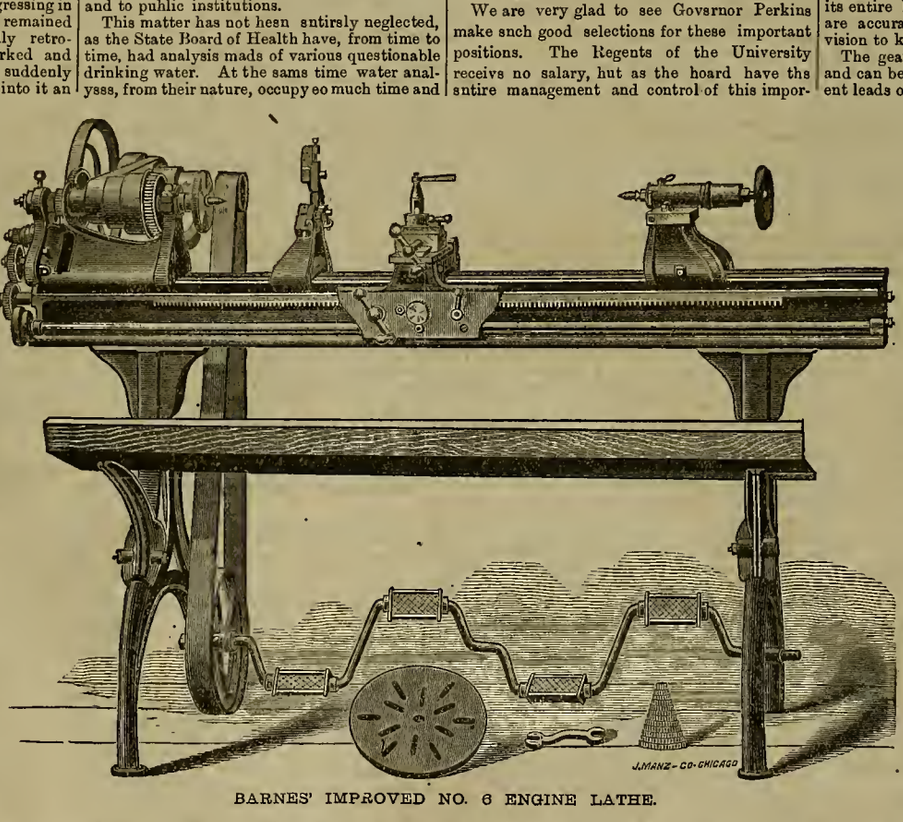
Mr. Bidwell is a well-known citizen, doubtless appointed as a representative of the agricultural interests. He is an active and zealous promoter of progressive enterprises, and well acquainted with matters pertaining to the industrial condition of the State.

An Improved Engine Lathe.

We illustrate on this page one of the Barnes patent engine lathes (No. 6), improved pattern. This lathe swings 12 inches on the face plate, 6 inches over the tool carriage, and will take work 44 inches long between centers. It is a very powerful back-geared engine lathe, and has all the necessary appliances for the rapid and accurate execution of light or heavy work. This size will best answer the requirements of those who want a lathe for general work of a heavier class than can be done on the No. 5 lathe, and yet within the range of foot power.

The head stock is very heavy, with a hollow steel spindle that will admit a 7-16 rod through its entire length. The boxes are of brass and are accurately fitted to the spindle, with provision to keep them true and take up wear.

The gearing is all cut from the solid metal, and can be combined to make some 500 different leads of thread; a table is attached to head stock giving the combinations for all threads in ordinary use. The cone has four changes of speed, and is run by a one and a half inch belt; this, with its back gearing and differential pulleys, has a greater range of speeds than has commonly been offered in a foot-power screw-cutting engine lathe for the price.



BARNES' IMPROVED NO. 6 ENGINE LATHE.

The tool carriage is a model of convenience and accuracy; it can be fed positively to either right or left as desired. The tool can be set to work at any position or angle desired; also to bore a taper hole or turn a ball, features not in ordinary movements of tool carriages. All wearing parts are gibbed and can be tightened up. The feed screw is under the bed and behind the rack where it cannot be injured; a friction feed rod is also provided, which can be used instead of the screw feed, thus saving that part for accurate use in screw cutting. Either the screw or rod feed may be instantly started, stopped or reversed at will.

The tail-stock can be set over for turning tapers; the spindle is cast steel with a true taper hole for the center; the center is hardened and self-discharging.

The patent velocipede foot motion used on this lathe gives a very great power; no balance wheel is required, as the foot motion is reciprocating and continuous, and there are no "dead centers" to overcome.

This lathe weighs 500 lbs., and the weight is all in the working parts, giving it great steadiness and strength.

These lathes may be seen in this city at Osborn & Alexander's, 628 Market street, agents for Barnes' foot-power machinery, and importers and dealers in mechanics' tools and hardware. Barnes' machinery comprises scroll and circular saws, turning lathes, foot-power mortisers, hand tenoning machines, etc., etc. This No. 6 lathe is sold for $170.

SUTRO TUNNEL CO.—On March 1st, the following Trustees were elected: Chas. W. Brush, W. H. Tillinghast, William Irvine, F. F. Low, Adolphe Sutro, Elliott J. Moore and David Cohn. The Trustees then met and elected Charles W. Brush, President; W. H. Tillinghast, Vice-President; Lazard Freres, Treasurers and the Registrars in San Francisco; the Union Trust Company, Registrar in New York; the Farmers' Loan and Trust Company, transfer agent in New York; Pelham W. Ames, Secretary. The resignation of Mr. Sutro as Superintendent, was accepted. The reports read showed that the expenditures of the company during the year amounted to $527,896.19, of which $489,380.82 was on the tunnel work. The following royalties were received during the year: From the Con. Virginia (half rates), $20,099.97; California (half rates), $15,633; Hale & Norcross, $2,450; Savage, $61,810; Gould & Curry, $43,260; Best & Belcher, $28,700. Total, $132,220.

Gum-lac from Arizona.

[Read before the California Academy of Sciences February 2, 1880.]

There was received lately at the Universsity, sent hy Mr. John A. Cnlhertson, of Phœnix, Arizona, a quantity of a substance of resinous character forming a coating of considerabls thickness on ths twigs of a plant, called in that neighborhood "greasewood," but which Prof. Hilgard assurss me is the *Larrea Mexicana*. The plant was identified hy meane of leaf, flower and seed sent hy Mr. Culbertson. The specimens wsre gathered in the vicinity of that place on the 22d of Decemher last.

The form of occurrence is the same as that in which the gum-lac of India and the East Indies occurs, as a coating of hard brittle resin of a red-dish color. Ths gum-lac from India is said to sometimes occur in layers a qnarter of an inch in thickness. In none of these is it so thick, hut in some exceeds an eighth of an inch in thickness, and in most of the specimens the gum is of nearly that thickness. The gum-lac is of cellular structure, and in these cells ars developed the ova of the insect (*Coccus lacca* or *C. ficus*), whose puncture is said to cause the exudation. Thess cavities are said also to coutain a red suhstance which prohahly serves as the food of the young insects and in which the eggs arc deposited. The specimen from Arizona exhihits the same structure, and in working with it, my fingere were often stained hy the crushing of soft pulpy matter of a hlood-red color, in whicb the eggs were visihls under ths lens.

The following properties of ths gum-lac given hy various authors have besn found to be also properties of the specimens examined hy me:

1. Contains a red coloring matter partly soluble in water (resemhling cochineal). I found about 3% in one test.

2. Partly soluhle in alcohol with a reddish color.

3. Almost entirely solubls iu dilute caustic alkalies with a deep red color.

4. The resin of the lac is soluhle in diluts horax solutions with a purplish-red color, and the solution, particularly when warm, has a psculiar sweetish odor. The resin of this prod-uct is also soluble in horax solution, the color is a little hrighter red than the shell-lac solution, and the odor stronger. This may he owing to the greater freshness of the Arizona product, as the shell-lac used for comparison was at least four or five years old.

5. The lac resin softens at comparatively low temperatures. This product also hecomes soft and plastic when it feels but just warm to ths touch.

6. When warm, has a peculiar aromatio odor.

Quantitative analyses of the crude lac, or stick-lac, have heen made hy several chemists with various rssults:

HATCHETT.

Resin	68.0	per cent.
Wax	6.0	" "
Coloring matter	10.0	" "
Gluten	5.5	" "
Foreign bodies	6.5	" "
Loss	4.0	" "

DR. JOHN.

Resin soluble in ether	66.65	per cent.
Resin insoluble in ether	16.75	" "
Laccic acid	0.62	" "
Coloring matter	3.75	" "
Extractive	3.92	" "
Insect skins	2.08	" "
Wax	1.67	" "
Salts	1.04	" "
Sand	.62	" "
Loss	2.90	" "

FRANKE.

Resin	65.7	per cent.
Substance of lac (Soluble in KHO)	28.3	" "
Coloring	0.6	" "
Total	94.6	per cent.

It will hs seen that an exact analysis of all constituents would not serve to establish identity when no two analyses agree on the constituents evon approximately:

	Hatchett.	Dr. John.	Franke.
Resins	68.0	83.40	65.7
Coloring matter	10.0	3.75	0.6

Partial analyses, however, would at least throw some light on the question.

I hoiled a portion of the Arizona stick-lac, carefully removed from the twigs, with water, and thereby extracted 3% of deep red coloring matter. The residue was then extracted with boiling alcohol until no more would dissolve. About 61.7% of extract was thus ohtained, prohahly mostly resin. Of the residue a large portion dissolved easily in dilute KHO, and the alkaline solution was of a deep purple-red color. A portion also dissolved more slowly in dilute KHO on hoiling, and was reprecipitated hy addition of acetic acid as a gelatinous flaky precipitate. The coloring matter dissolved by KHO was, howevsr, not thus reprecipitated, hut its color, hleached by acetic acid, was restored in the filtrate tberefrom hy again adding dilute caustic potash.

A second, more thorough and extendsd examination was made hy first extracting the powdered resin (dried hefors weighing) with absolute alcohol, which was found to leave the coloring matter nearly all behind, thsn extracting the coloring mattsr hy hoiling the residue with watsr, then extracting the residue from this operation with dilute caustic potash. The final residus was dried and weighed, the alcoholic and aqueous extracts also evaporated and weighed, the KHO solution precipitatsd with acetic acid, and the precipitated mass wasbed, dried and weighed. By this process there was lost a certain amount of coloring matter soluhle in KHO and not reprecipitated hy acetic acid, but to hs detected in the filtrate and wash water.

The results of this determination gave:

Resin soluble in alcohol	61.7
Coloring matter soluble in water	1.4
Resin (?) and other bodies soluble in KHO	26.3
Residue insoluble in all these solvents	6.0
Loss (including coloring matter soluble in KHO, but not in water)	4.6
Total	100.0

The 26.3% soluble in KHO and not in alcohol appears to be ths suhstance, or collection of substances more prohahly, which Franke called "material of the lac" (Muspratt's chemistry), and which he finds to he 28.3% in his analysis of India stick-lac.

It will be seen how closely the gum-lac of Arizona agrees with all characteristic properties of the varieties from India, which in the form of stick-lac on the twigs, or as seed-lac when hroken from the twigs and ths coloring matter partly removed, or after melting and straining as shell-lac, which is used for varnishes and in the making of sealing wax. The red coloring matter or lac-dye is also used as a dye stuff—superior in some respects to cochineal (Muspratt). In composition also it agrees, as will he seen from the ahove analysss, as nearly as can he judged from the imperfect data and discordant analyses quoted. These disagreements are partly due to different methods of analysis—partly, quite probahly, to real differences in differsnt specimens, and partly to differsnt intsrpretation of results of analysis.

It would bs very interesting to have the Arizona *Coccus* examined and identified, or at least compared with the *Coccus lacca* or *C. ficus* of India, as their modes of life as well as the products of their activity appear identical.

J. M. STILLMAN.

Universsity of California, Jan. 30, 1880.

Leadville, by an Old Nevada Miner.

Mr. John H. Daly is in receipt of an interesting letter from an old White Pine friend, now operating in Leadville. We are permitted to make the following extract from it:

It is hard to predict the future of this camp. There are vast quantities of ore in sight in the mines, yet they all think they will find other hodies underlying the ones they are now working. To me it looks douhtful, especially on Carbonate and Fryer hills, whsre ths principal mines now are. Higher up in tbe hills I think thsy will find other contacts and pay-mineral hy sinking deeper than the ore hodies now discovered, for ths front mines have a slight dip into the hills. If no other hodies of ors are found on Fryer and Carhonats hills, it is only a matter of time for them to work out. But it will take some time to work out the ore in sight. So that, with ths nsw strikes that ars certain to hs made, will keep ths excitement up the coming season. Of course the outside districts will help very much. There never was a mining camp so well advertised as this. I never saw property sell for a quarter of the prices one can get here. Any hole that shows some pay ore, will sell for from $50,000 to $150,000. Good paying mines that are shipping ore, with a good hody in sight, sell from $250,000 up into the millions. Prospsct shafts, without a color of minsral, sell for from $10,000 to $50,000, according to ths locality, while eome bring $100,000, without any pay minsral in sight. It is ths opinion of every one, or most of them, that all you havs to do is to sink dsep enough to find the mineral. The tender-fest got the best of this country, for old miners would not sink "blind," and thus thsy missed big fortunes hy not doing it. It is a good deal like Chlorids Flat. The mineral is found hy sinking, without any surface indications. Any shaft or claim near one that has struck good ore, can bs sold for a good prics.—*Eureka Sentinel.*

ELBOW DISTRICT.—New finds are the order of the day in Esmeralda county, and will no douht continue to he for some time to come, as the county is only just beginning to hs prospected. For years parties have noticed the fine formation of that section of country lying at and in the vicinity of Elbow station, 16 miles west of Aurora, on the road to Carson, and it is donhtful if any one would have known what treasnres were hidden there, had not R. F. Jerdon hroken off a piece of rock and had it assayed; the result was $30 a ton. He immediately staked off a claim. As soon as the ahove facts wers made known the community was all excitement, and claims were located in every direction. The first location is ahout a quarter of a mile from Elbow station. A meeting was called at which the local mining laws governing Esmeralda district, with a few alterations, wers adopted, R. F. Jsrdon elected Recorder, and the nams of Elhow was given the district. Work has already hegun on ssveral of the locations, some of which show fine ledges with perfect foot and hanging walls.—*Esmeralda Herald, Feb. 21st.*

THE penalties for ohstructing census takers, who bsgin their lahors on ths first Monday of June, are severe. The law says: All psrsons ahove the age of 21 years who shall refuse to furnish the information required hy the supervisor or enumerator shall forfeit and pay a sum not exceeding $100, to be recovered in action of dsbt. Presidents, directors or other officials of privats corporations who refuss to furnish information required of them, are made liahls to a penalty not to exceed $10,000.

Public Lands Commission Report.

The forthcoming report of the Puhlic Lands Commission will recommend that swamp and pasturage lands hereafter he surveyed and patented by townships; that hetter provisions he made for making houndaries of surveyed tracts; that ths system of letting puhlic survsys and houndaries between States and Tarritories he hereafter mads under ths direction of ths Coast and Geodstic Survey. It will also, probahly, recommend that the offics of Receiver at each local land offics bs aholished. There ars about 95 of thess officers. It will aleo recommend the classing of puhlic lands into five general classes—arable, irrigahle, pasturage, timher and minsral. It will also recommend ths repeal of the pre-emption law, on the gronnd that its chief use now is to increass large individual holdings. Ths commission will prohahly supplement it by another, making arahle public lands disposable under the Homestead laws. The commission will probably recommend no limit he placed upon amounts of irrigahle land which any one person may huy; that the land he sold at 25 cents per acre, one-fifth to he paid down and the halance at the end of three years, and that no patent to snch lands he issued until it is shown that a specified sum per acre, say $2, has hesn expended on its reclamation. Lands classsd as pasturage, will comprise untimhered and new mineral lands, not arahle or capahle of irrigation.

The commission will prohahly recommend that the quantity one psrson may huy he not limited, and that ths prics he graduated as follows: All lands sold prior to January, 1886, be at ths rats of $1.25 per acrs, and all lands sold from the latter date to Jauuary, 1890, to bc at the rats of $1 an acre. Aftsr the last named date all lands remaining hs sold at 75 csnts an acre, with a reduction of 12½ cents psr acre svery thres years until the minimum prics of 12½ cents is reached. Pasturage lands shall he opened to homestead settlement, no one entry to comprise more than 2,560 acres. It will probahly recommend that colonies of 20 or more families may enter homesteads either on arahle, irrigable or pasturage lands, and lay out a village in the csnter of the tract.

Radical changss will hs recommended in the mineral land laws, among them the following: That the time during which a prospector or discoverer shall bs able to hold his claim by possessory title shall he fixed and limited by law; that all local organizations aud regulations respecting mining titles shall hs aholished and the sole jurisdiction of all questions rslating thereto bs resarved by the United States; that the "lode location," which permits the discovsrer to follow a lods any distance, in any direction, whether within the houndaries of his surface location or not, be repealed; that hereaftsr every mining claim shall comprise a certain numher of feet, breadth and length on the surfacs, and that suhtsrranean property rights shall not extend beyond the surface boundaries thus fixed. It is quite prohahle that the commission may refrain for ths present from making any rscommendation as to the area which each location may comprise. It also recommends that a system of official survsy and mineral inspection he adopted to prevent hlackmail and rohhsry, and to ohviate the necessity of legal contests hefors claims ars patented.

The Belmont Concentrating Mill.

It is well known that there are largs quantities of low-grade ore in the Belmont mine that will not pay to mill. About thres months ago the company concluded to erect a concentrating mill near ths mine, and on the 19th inst. it started up and was kept running until the 28th. The result proved heyond a doubt that the low-grade ores in the Belmont mine can he profitahly concentrated. The mill is 30 hy 60 feet. There are hut five stamps up, ths frams is huilt for 10 stamps, and the additional five will be put in place soon. The engine is of 40-horse power, and is run hy a portahle hoiler, which is not largs enough to furnish sufficient steam. It will he replaced hy a larger one. The process under which these ores are worked is very simpls. The ors is run from ths shaft to the mill—a distance 80 feet—into a self-feedsr, from where it runs into the separator, whence it is carried to the hlanket slnices whers the sulphurets are saved. The average assay of ore passing through the battery is $25 per ton, and the concentrations assay from $75 to $100 per ton. The cost of putting this ore through the hattery and hlankets is hut $3 per ton, and the five stamps can easily reduce 12½ tons per day. There are two large tanks, one for the sluices and another for washing the hlankets. The sluices are 350 feet long, hut it is the intention to made them longer. Ths sluices work well, and after the first 150 feet scarcsly a trace of sulphurets can he detected, thus proving that they are caught hy the hlankets. This concentrator is a great triumph for the company, as they now have a sure and profitahle method of working ths thousands of tons of low-grade ore in the mine. A Whits furnace and some pans and settlers will he put in. Chloriders can now go to work with a will, for the cost of reducing will hs materially lessened.—*Belmont Courier.*

THERE are very few coal mining companies that can figure up a profit on last year's husinese. It is stated that there was less money realized last year from the husiness of 26,000,000 tons than there was from ths 17,500,000 of the year preceding.—*Coal Trade Journal.*

Are Telephones Telegraphs?

A somewbat singular discussion, involving tbs question as to whether telsphones are telsgraphs, has arisen in England, growing ont of the fact of ths connection of the Postoffics Department thers with ths telegraph. An application has been made for an injunction against ths Telephone company to restrain them from discharging their functions, except under ths Post-office regulation in relation to the telegraph. After some considerahls discussion it has heen arranged that an injunction should not he taken, hut that ths defendant companies were to keep certain accounts until the hearing and final dscision of ths cass.

The argument on bshalf of the Postoffice ie that telephones are telegraphs within the meaning of ths act by which the latter inventione were committed to the chargs of the Postoffice Department, and the Attorney-General represented it to he a serious grievance that the government, after spending millions on telegraphs, now found their monopoly interfered with hy telephones, which, he submitted, were practically the same invontion. The government had, thersfore, hs said, hsgun these proceedings by information in the Court of Exchequer.

It is reported, although this part of the question was not mentioned during the hearing, that they hope to be able to compel the telephone companies to take out licenses from ths Post-master-General, and pay royalties for doing so. The *Times* has an editorial on this subject, which concludes as follows: "The proposal to obstruct the developmsnt of the invention is one it would he impossihle to defend. The fiscal argument is simply irrelevant. If the nation made a bad hargain in forgetfulness of the admitted commercial principle that few patents ars worth more than three years' purchass of thc receipts arising from them, the nation must hear the loss, however great it may be. It will not hs diminished otherwise than apparently, hy restricting the use of telephones. If any such restriction is sanctioned hy the courts, it can scarcsly fail to he removed by the direct intervention of the legislature. A tax npon telephones would he practically a tax upon knowledge. Any sucb imposts belong to the past rather than to the present or futurs."

STRIKE IN THE QUINN MINE.—At the Quinn mine, Spring Valley, helow Silver City, they cut into genuine hlack sulphuret ore of the richest character. The ore is not only rich in black sulphuret of silver, hut also shows native and ruhy silvsr. A hox of the ore was brought to this city. The sample showed $794.85 gold and $29.65 silver, making a total of $824.50. Hitherto it has heen just the other way. The hundreds have heen in silver and the tens in gold. A day or two since we took a piece of porphyry from the Quinn to Wiegand & Co., who madc a careful assay and found it to contain $1.60 gold and $19.90 silvsr, or a total of $21.50. The rock did not contain a particle of quartz, but had a look of heing mineralized. It was a portion of a houlder of considerahle size that was encountersd in the midst of the ore hody. This rich ore is found at a depth of but 100 feet beneath the surface. Indeed the paying ore is found quits up to the surface, but it is of a very different appearance from that cut into. That at or near the surfacs is of a yellow or rsddish hue, while ths ore just found is, as we have said ahove, genuine hlack sulphuret. The shaft was sunk to the depth of 100 feet when a crosscut was started to the wcst. This crosscut wae driven 70 feet when a deposit of ore 15 feet in width was cut. This ore was of a very even quality, hardly an assay going hslow $12 and few over $55. The strike was in drifting north in the 15-foot vein. Here the rich black sulphuret ors suddsnly showed itself. It was but six or eight inches wids whsn it first appeared, hut within a yard it had attained a width of two feet. It would seem to he the apex of a chimney of splendid ore. Where this strike has heen made is 150 feet north of where the last rich oro was found on the surface and nnder a point where nothing is to hs seen on the top of the gronnd. The Quinn is on a direct line with the Yellow Jacket nsw works, the Forman shaft and other shafts on the lode.—*Territorial Enterprise.*

EASTERN CAPITAL IN MINES.—An articls in tbe Nsw York *Tribune* says: Twsnty million dollars would he a very low estimate of the amount of Eastern capital invested in Western mining enterprises during the past year. Tbe Fifth Avenne hotel is the mining rendevouz of this city, and it is safe to say that one-third of the men who throng ths main corridor from 7:30 to 10 P. M. havs mines to ssll. As you saunter through the crowd the words "mine," "ore," "shaft" and "dividend" are heard on all sides. Some of ths hest properties shnn pnhlicity. "No stock for sale" is a conspicuons advertisement of some companies. This announcement is supposed hy many to hs a ruse, hut it is simply the truth. The stock of four of ths largest mining companies in Leadville has heen taken in large hlocks for investment only. A dividend of $100,000 declared a few days ago will he paid with fewer than a dozen checks. Large properties placed recently have heen sold in lots of not less than 1,000 shares each.

LAST year Colorado produced $2,310,000 worth of coal, and $16,300,426 worth of gold and silver bullion.

MECHANICAL PROGRESS.

Progressing.

The idea of making a train lay down and take up its own rails as it moves along is not a new one, but an interesting realization of the progress which is being made in that direction is now to be witnessed in the Jardin des Tuileries, Paris. The system is that of Clement Ador. The rails on either side of the carriages consist of a series of jointed pieces of rail, with flat supporting pieces; they inclose the system of wheels, passing down over the front and up over the end wheels, and all the wheels have two flanges to prevent any derailment. In front the chains of rail are guided by two distributing wheels, which are governed by the traction, so that on pulling obliquely, right or left, the endless way automatically follows the same direction. At the end of the train, again, are two taking-up wheels, provided with differential motion to meet the difficulty of going in curves, which involves an extension of the rail on one side and a contraction of that on the other, so that whatever the curve (to six or seven meters radius) the way is regularly put down and lifted.

From the mechanical point of view one is struck with the smallness of the force required to move a train thus arranged. In the Jardin des Tuileries the train consists of three carriages, capable of containing in all thirty children, and often full. These are drawn by two goats, which work thus for seven hours. The total load is rather more than a ton. To draw a like weight in three carriages on ordinary roads would require a dozen goats, four for each vehicle. The economy of carriage, then, is incontestable. The normal speed is three to four miles per hour. The system is, of course, not designed for passenger traffic, but for goods, and in many places, with bad roads or none, might be very serviceable.

LUBRICATING BEARINGS.—It is impossible for a bearing to run cool until the high places upon it are so reduced that there will be a uniform film of unguent between the two surfaces. It is a custom for purchasing agents, and in some cases for practical men, when ordering oil, to mention simply "lubricating oil," without specifying the kind of bearings for which it is to be used. The latter is a very essential point. Frequently when the oil is received, it is found to give very poor satisfaction, and some of the bearings are found to run hot. Under these circumstances, the oil is generally charged with the fault, when, in reality, the fault has been in giving the order. A good lubricant for a small, close-fitting, fast-running bearing must be of a very fine quality, and have a light body, in order to distribute itself between the close-fitting surfaces. Such a lubricant is entirely unfit for large bearings, where more body is required to carry the heavy weight which is placed upon them. It is the practice in most shops to use the same kind of lubricating oil for all the machinery, which, when properly considered, is both unreasonable and extravagant, for the reason that a bearing when improperly lubricated is worn away much faster than it would otherwise be, and on fine machinery the lost motion in the bearings requires frequent attention.—*Mechanical Journal.*

INTERESTING TO FOUNDRYMEN.—It is well known that cheaper classes of pig iron contain a certain percentage of sulphur and phosphorus, the separation of both or either of these elements is very desirable, but can not easily be effected in the cupola which is used in most foundries. A contemporary suggests the following simple method, which can be tried at but a trifling expense, and which may improve the character of the iron: To every hundred pounds of iron add from three-fourths to one and one-half pounds of peroxide of manganese, and smelt it together in the usual way in the cupola, then when the iron is tapped from the furnace into the pot or ladle, take a handful of a mixture composed of one part of dry air-slacked lime, and with two parts of oxide of iron or common bog iron ore, have this mixture well dried and pulverized so as to pass through a 60-wire screen, syringe the same over the surface of the melted iron, stir it up with a rod, and then either skim it from the surface or hold the slag back in pouring it into the molds. We have tried the above and find the texture of the iron greatly improved. Manganese ore and bog iron ore can be found in any quantity in California, and at a very low price.

WELDING TUBES AND TIRES.—Herr Krupp, of Essen, Germany, has recently patented in Germany a method of welding tubes and tires, which is based upon an excellent idea, although the practical details recommended by him do not strike us as being very well elaborated. He draws the tube over one of a pair of ordinary rolls, and then heats the whole length of the portions to be welded by a special contrivance, which is a portable fire-box, into which air is so blown that the heat is directed against the weld. After the necessary heat is attained the rolls are set in motion and the place to be welded is repeatedly drawn through them. His heating apparatus appears to us clumsy, and could, we believe, be replaced to advantage by some gas apparatus similar to that used for heating wagon tires in this country and in France.

THE COCKERILL CLASSIFICATION OF STEEL.—The famous Societe Cockerill, of Seraing, Belgium, classify the steel made at their establishment as follows: All steel containing from 0.05% to 0.20% of carbon is graded as extra mild. It has a tensile strength of from 25 to 32 tons per square inch, and an elongation of from 20% to 27% in 8-inch bars. This steel may be welded, but does not temper, and is used chiefly for girder plates, ship and boiler plates, wire, nails, etc. The second class embraces metal ranging in carbon from 0.20% to 0.35%. It possesses a higher tensile strength, from 32 to 38 tons per square inch, but less ductility, the elongation being 15% to 20%. It hardens little and can scarcely be welded, and is the material from which the Cockerill Works make some of their rails, axles, tires and guns. The third class, that of hard steel, is characterized by a percentage of carbon varying between 0.35% and 0.50%, a tensile strength of 38 to 46 tons per square inch, and an elongation ranging from 15% to 20%. It does not weld, but may be tempered. It is used for rails, tires, springs, guide bars of steam engines, spindles, hammers, etc. The hardest steel, having a percentage of carbon varying from 0.50% to 0.68%, is capable of bearing a strain of from 46 to 51 tons per square inch, while it elongates only from 5% to 10% in sample bars 8 inches long. It cannot be welded, but takes a strong temper, and is for that reason used for various cutting tools, files, saws and delicate springs.

COATING METALS WITH BRASS.—Herr J. J. Hesz, of Vienna, claims to have developed a good method for coating metals with brass by electricity. He states that the greatest trouble experienced hitherto in accomplishing this has been to obtain a bath which has the power of dissolving both copper and zinc well, so that alloys of the two may be dissolved and deposited uniformly. With former solutions too strong a current would yield a grayish deposit of zinc, and too weak a current would give a pale reddish color, while in the most favorable case a poor yellow was obtained. He prepares his solution in the following way: Dissolve 84 parts, by weight, of bicarbonate of soda, 54 parts of chloride of ammonium and 13 parts of cyanide of potassium in 2,000 parts, by weight, of water. Then cover the sides of the vessel containing the bath with sheet brass, cast, not rolled, and suspend a sheet in the bath, the former acting as a node and the latter as cathode. After allowing the current to pass through for an hour, the bath will be prepared for any objects to be coated with the same alloy.

NEW VISE AND ANVIL DRILL.—A combination tool consisting of a vise and anvil combined with a drill attachment is being introduced into the machine shops at the East. It is said to be of great convenience and utility. With this tool the work can be held in the jaws of the vise in any desirable position, and a hole may be drilled either straight or at any required angle. It seems well adapted to the work of machinists and all other mechanics working in metals. It is fastened on a bench like an ordinary vise. The drill press can be removed in an instant when the vise or anvil is wanted separately. This combination tool is capable of a wide range of application in various kinds of iron and steel hand work. It is well made in all its parts, and only the best materials are used in its construction. The shaft to which the drill press is fastened and the spindle are both made of steel. Each machine is furnished with a chuck capable of holding drills from half an inch down.

THE SHOP ANGLE.—It is well known that the Sellers, or American standard screw thread, is an angle of sixty degrees, but it may not be generally known that this angle is adapted to many other purposes in the machine shop. It is the best angle for lathe centers, for the cutting edge of lathe and plane tools, for the edge of the cold chisel, the edge of the center drill, the lips of pin drills or counter-bores, the teeth of reamers, the teeth of milling tools, and in short most of the edges used for cutting metals, even the edges of shears for cutting sheet metals. To obtain this angle on tools, gauges should be used in the shop, and the tools and lathe centers ground and finished to them. These gauges may be made of different sizes, one large enough to gauge lathe centers, and another small enough to gauge the edges of cutters, stationary or rotary.

HOW TO DRILL CHILLED CAST IRON.—J. W. Nichols, Windsor, Mass., writes to the *Blacksmith and Wheelwright* as follows: Chilled cast-iron sleigh shoes and other pieces of cast iron too hard to drill can be softened successfully by the following method: Heat the part you wish to drill nearly to a white heat. Then make a hole in the coal in your bin large enough to admit your casting, and pack the coal carefully about the heated portion. Let it remain until cold, when it may be easily drilled. I have tried Chose's recipes and others, but they do not give as good results as the above.

RULE for finding the weight necessary to put on a safety valve lever, when the area of valve, pressure, etc., are known: Multiply the area of the valve by the pressure in pounds per square inch; multiply this product by the distance of the valve from the fulcrum; multiply the weight of the lever by one-half its length (or its center of gravity); then multiply the weight of the valve and stem by their distance from the fulcrum; add these last two products together, subtract their sum from the first product, and divide the remainder by the length of the lever; the quotient will be the *weight* required.

SCIENTIFIC PROGRESS.

Man's Prehistoric Progress.

The caves, tombs and gravel drifts of the earth, which are of all objects the most uninteresting to the casual observer, have in our days become strangely eloquent. At the touch of science they have lent a voice to the dumb past. Raising the veil of antiquity, they have unrolled page after page of ancient history, written neither with pen, nor pencil, but stamped on the rude implements of war or the chase, imprinted on the few threads of decaying tissue that inwrap the crumbling skeleton, engraved on the bracelet of bronze or silver that encircled the slender wrist of some prehistoric beauty, or chased on the brooch of gold that clasped the mantle of some renowned but forgotten chieftain.

So exact are the deductions to be drawn from these mute records of the past that they have been divided into four well-defined ages—the drift age, the age of polished stone, the age of bronze and the age of iron; each of these marking an advance in knowledge and civilization which amounted to a revolution in the then existing manners and customs of the world. The drift age or paleolithic period is marked by deposits of rude stone implements; to it succeeds the neolithic, or age of polished stone, in which the same stone implements were in use, but of a superior class, highly polished and well finished.

The wandering savage who lived by the chase and cut up his prey with the rude, unpolished flint knives of the paleolithic age was coeval with many extinct animals which then ranged over the forests that in those early times quite generally covered the earth. In the caves the rudest occupy the lowest strata; showing that even in that remote age man had the same tendency to improve as now. Some of the remains of the ancient Nimrods have been found in caves and sepulchral tumuli; and of all the living races of men they resemble the Esquimaux most closely. With them are found the remains of such extinct animals as the cave bear, mammoth and woolly rhinoceros.

The neolithic era marked the dawn of a new and higher civilization. In many parts of England, collections of polished stone implements have been found, such as stone axes and adzes, chisels, gouges, small saws, hammers, awls for boring, stone picks for turning up the soil, pestles, mortars, querns and spindle-whorls. Needles have also been found, which imply a knowledge of the art of sewing; and vessels of rude earthenware, which show that these old-world folks could ply the potter's craft with a considerable degree of deftness. They possessed the horse, a small short-horned ox, two kinds of swine, goats and horned sheep, with dogs of a large breed. Their dwellings seem to have consisted of pits roofed with wattle. They were all built, or, rather, scooped out upon one plan. There was a circular shaft for an entrance, going down to a depth of from seven to eight feet, five to seven feet wide at the bottom, and narrowing to three at the top; and round this was a chamber or cluster of chambers. In these huts are found a variety of polished stone implements, bones of the domesticated animals and shreds of pottery. The flint of which these stone implements are made was obtained by quarrying for the flint nodules in the chalk. Many of these mines with the mining tools still remain.

In some instances, caves seem to have been used as dwellings; and, where not employed as a shelter for the living, have been frequently selected as a resting-place for the dead. In these cave mausoleums, numerous skeletons of both sexes and of all ages are found. From the quantities of calcined bones found in some of these graves, it is believed that, in the case of a chief, human sacrifice may have been offered. From the number of these tombs and dwellings, we are led to the conclusion that Europe had in those days a somewhat large and tolerably civilized population, who had flocks and herds, who practiced agriculture, and who were hunters and fishermen.

In the lake dwellings of Switzerland, which are assigned to this era, many interesting discoveries have been made. Three kinds of wheat have been found; also two kinds of barley, two kinds of millet, the remains of fruit such as apples and pears, peas, flax and weeds. For their cattle and swine the lake dwellers seem to have laid up winter fodder in the shape of acorns and beechnuts. They made cloth of the flax, and could even weave it into an ornamental pattern.

However acquired, the possession of bronze marks an era of advancement. The dwellings of the people who used it were better, and their circumstances more comfortable than the tribes they succeeded. They had axes and sickles of bronze, gouges, chisels, hammers and knives; and, as a natural consequence, all the products of their labor were superior and better finished. They could weave well a tough and strong fabric, and their clothes were formed of several pieces sewed together. Their cloth is almost invariably of linen—no woolen cloth belonging to this period having been found either in France or Switzerland; but in a wooded coffin discovered in 1861 at Ribe, in Jutland, the remains of a body was found inclosed in a cloak of coarse woolen cloth; a woolen cap covered the head, the lower limbs wrapped in woolen leggings. Another coffin contained the paraphernalia of an ancient belle, a brooch, a knife, a double-pointed awl, and a pair of tweezers—all of bronze, two studs, one of bronze and one of tin, and a javelin head of flint. Bodies wrapped in woolen cloth have also been found in Britain. It is, however, worthy of remark that it is only in the exceptional cases in which the body is turned into adipocere (an unctuous, waxy substance), that woolen cloth is found; in normal circumstances that fabric would disappear far more rapidly than linen.

The bronze remains found in the Rhone valley prove that the art of metal-working, once acquired, was carried by these early races to great perfection. They were acquainted with the processes of casting, tempering, stamping and engraving metal. With this discovery of a new art came a simultaneous improvement in the potter's craft; the rude cups of the neolithic age disappear, and are succeeded by vessels of an endless variety of form and ornamentation, some of which are extremely beautiful. Some of the vases are inlaid with tin, others are marked with the same patterns employed to decorate the Etruscan vases of Italy; while others, found in the pile-dwellings of the Lake of Bourget, have representations of men and animals. The collections of bronze jewelry are also abundant and curious. They consist of bracelets, armlets, long hairpins with decorated heads, rings, ear-rings, girdles adorned with pendants, brooches, buttons, studs and torques for the neck.

In primeval times, many animals were abundant all over Europe, which seem gradually to have disappeared, such as the cave-hyena, the cave-lion, the mammoth, the woolly-haired rhinoceros, the hippopotamus, the musk-ox, the Irish elk, the wild horse, the glutton, the reindeer, the aurochs, and the urus or wild ox.

With regard to the antiquity of man, Sir John Lubbock comes to the conclusion that man certainly existed in Western Europe during the period of the mammoth, and the presumption is that he also existed in pliocene and even in miocene times; but the proofs of that are to be sought, he thinks, in warm, almost in tropical climates.

From the manners and customs of modern savages much light may be thrown upon the early condition of prehistoric man. After considering the condition and progress of the Hottentots, South Sea Islanders, Esquimaux and others, Sir John Lubbock remarks that, "it is impossible not to admire the skill with which they use their weapons and implements, their ingenuity in hunting and fishing, and their close and accurate powers of observation." By all these qualities we may suppose prehistoric man to have been distinguished in at least an equal degree.

It is evident that man when he first spread over the surface of the earth must have been in a condition represented by the lowest type of savage. Then by slow degrees, by imitation, and by the teaching of experience, the capacity of lodging and clothing himself, and of improving his simple implements, would develop and expand, until man, physically one of the weakest and most unprotected of all animals, would, by dint of that subtle force which we term mind, make himself independent of nature, and at last, "monarch of all he surveyed," and able to cope in his native coverts with the shaggy lion, and overtake in the chase the fleet stag or bounding antelope.

The wild man, like the wild beast, is always timid, always suspicious, always on the watch; and the condition of the savage woman is still more cruel. "She shares," says Sir John Lubbock, "all the sufferings of her mate, and has also to bear his ill-humor and ill-usage. Even the possession of beauty, far from being an alleviation, is only an aggravation of the evils of her lot, by securing for her a hard taskmaster to many masters."

With growing civilization, on the other hand, come security and confidence, and that sense of justice and honor which is the best protection of the weak; and with the increasing and ameliorating influences of science, a great improvement may still be looked for in the condition of our race. We stand, perchance, upon the threshold of a future, brighter than even the brightest dreams of our past; on the verge of a Utopia long deemed impossible, when the moral nature, unvitiated by an erring will, shall no longer fetter the eager soul to base aims and unworthy aspirations, but shall leave it to its free scope and native regality of birthright and action. Then to the human race, still in its vast masses so ineffably degarded, a new and more mighty civilization may unlock boundless stores of knowledge and power, and unseal fresh fountains of pure and unfailing enjoyment.—*Condensed from Chambers' Journal.*

AN UNEXPECTED COMET.—Dr. Gould, formerly of the Dudley observatory, Albany, N. Y., but now Director of the Cordoba observatory, South America, has telegraphed to New York that a great comet is in the neighborhood of the sun, passing northward. No large comet has been expected this year, and no small one at this season, Winnecke's comet not being due until near the end of this year. Reports by mail are awaited with great interest. Should Dr. Gould's dispatch be confirmed, a new member must be admitted to our cometary system; and possibly the nations north of the equator may also be treated to a sight of it.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 12.	Week Ending Feb. 19.	Week Ending Feb. 26.	Week Ending Mar. 2.
Alpha	9½ 9	9 7¾	8¾ 7	9 7¾
Alta	6¾ 4¾	4.30 3.70	3.90 3.05	4.20 3¾
Andes	95c 85c	90c 75c	90c 70c	80c 60c
Alps			1 1.15	90c 75c 60c
Argenta				
Atlantic				
Aurora Tunnel				
Baltimore Con	11¾ 10½	11¾ 10½	12½ 10½	12½ 12
Belcher	50c 40c	40c 35c	25c 20c	30c 25c
Belmont	10½ 9½	9¾ 8½	8¾ 7	10¾ 6¾
Best & Belcher	3.80 3.65	3.55 3	4 2	5 4.10
Bullion	4.80 4.20	4.55 3.55	4 2	5 4.10
Bechtel	2.15 2	2.20 2.05	2.05 2	3.05 2
Belle Isle	1.20 75c	1¼ 90c	1.05 90c	1.10 1.06
Bodie	10½ 9½	9¾ 8¾	9 8½	9¾ 8¾
Benton	2.90 2½	2.80 2.40	2.45 2	2.45 2¼
Bulwer	10½ 9¾	9 8¾	10 8½	9¾ 6¾
Boyle				
Black Hawk	90c 70c	80c 70c	80c 50c	80c 75c
Belvidere	1¾ 1	2 1.30	2.70 2¼	4.55 2.55
Booker	80c 65c	70c 55c	60c 50c	80c 60c
Caledonia	1.20 1	1.05 75c	85c 60c	1.45 80c
California	4 3.45	3.90 3.45	3¾ 3½	3¾ 3.20
Challenge	1.70 1.60	1¾ 1.60	1¾ 1	1¾ 1.65
Chollar	8 6¾	6¾ 6	6 6	6¾ 5¾
Confidence	7 6	7 6	7 6	7 6
Con Imperial	65c 60c	65c 60c	65c 50c	65c 55c
Con Virginia	3.85 3.45	3.85 3¼	3¾ 3¼	3.70 3¼
Crown Point	5¼ 4.40	4.85 4.40	4.70 3.85	4¾ 4.45
Gon Washoe				
Champion	75c 50c	55c 50c	55c 60c	50c 30c
Concordia	50c			50c
Dayton				
DeFrees				
Daney	40c 35c	35c		
Day	60c 65c	60c 40c	60c 45c	55c 50c
Eureka Con	16¾	16¾ 15	14¾ 14	14¾ 13¾
Exchequer	3.85 2.60	3.40 2.80	3 2.65	3¾ 3
Endowment	40c	35c 30c	25c 15c	20c 15c
Gen Thomas				
Grand Prize	1.35 1.30	1.30 1¼	1.35 1¼	1.40 1.30
Gila	5o			20c
Golden Chariot				
Golden Terra	15 14			
Goodshaw	45o 30c	40o 35c	30o 25c	30o 20c
Gould & Curry	6 5¾	5¾ 5¼	4¾ 5¼	4.95
Hale & Norcross	6¾ 5¾	7 6¾	6¾ 5¾	7 5¾
Hillside	1 60c	1¼ 1	1.10 1	1¼ 1
Highbridge				
Homestake				
Hussey				
Independence	1 90c	1.30 1	1.20 85c	90c
Julia	2.05 1¾	1¾ 1.55	1.60 1¼	1.65 1¼
Justice	2.40 1.65	1.80 1¼	1.60 1.15	1¼ 1.30
Jackson	3	2.90 2	2	2
Joe Scates				
K K Con		4	5¼ 4	6 4
Kentuck	3.90 3.60	3¾ 3	3¼ 3	3¼ 3
Kossuth	15c	15c	15o	15o
Keystone				
Lady Bryan	50c 40c	45c 25c	30c 30c	50c 35c
Lady Wash	1.05 80c	85c 70c	70c 55c	80c 65c
Leopard	20c 15c	20c 15c	15c	15c 10c
Leviathan	35c 30c	30c 20c	20o 15c	15c 10c
Leeds	40o 35c	50o 30c	50c	60c
Lee				
May Belle	30c 25c	30c		25o 20c
Modoc	35c	45c 40c	45o 40c	40c
Manhattan	1.70 1.60	1¾ 1¾	1¾ 1.40	1¾
Martin White	1 80c	1 80c	90c 80c	90o 85c
McClinton	60o 40c	50c 40c	50c 35c	70c 45c
Meadow Valley				
Mexican	17¼ 14¾	18 15¾	15¼ 12¾	16 14¾
Mides				
Morning Star				
North Con Virginia				
New York	50c 40c	45c 35c	40o 30c	45c 35c
Northern Belle	16¾ 13¾	17 14¾	16¼ 15	16¾ 15¾
New Coso				
Navajo	40o 30c	35c 20c	30c 20c	30o 25c
Occidental	1¾ 1¼	1.35 1	1.30 1	1.10 1
Ophir	17¾ 16	20 16¼	17¼ 14¾	18 17
Oriental	50o 30c	50o 30c	40c 30c	
Overman	7¾ 6¾	6¾ 5¾	6¾ 5¾	6¾ 6¾
Panther				
Phenix				
Phil Sheridan	20o	20o	15o	20c
Potosi	4.65 4.10	4¼ 3.60	3.70 2	4.85 3.40
Prospect				
Raymond & Ely	85o 70c	80c 70c	80c 60c	1 50c
Richer				
Rock Island				
Rye Patch				
Rough & Ready				
Savage	6¾ 5¾	6 5¾	5¾ 4¾	6¾ 5¾
Seg Belcher	16		19 15	20 16
Sierra Nevada	25 20¾	23¾ 21	22¼ 20¾	23¾ 22
Silver Hill	1.65 1¾	1.35 1	1.05 80c	1.10 90c
Silver King	7	7¾ 7	7	7
Silver Prize				
Succor				
Summit	1.20 1	1.10 1	1¼ 1	1¼ 1
Scorpion	3.30 2.90	3¾ 3	3.05 2.60	3.10 3
Solid Silver	40c 30c	35c 30c	5c	10c
South Bodie	60o 40c	70c 50c	70c 65c	85c 60c
South Standard	25o 15c	30c 25c	30c 25c	25c 15c
Star	25o 15c	25c	20c	25c 20c
St. Louis	25o 20c			
Syndicate	1.70 1.60	1.55 1.40	1¼ 1¼	1.45 1.30
Tioga Con	3¼ 3	3.10 2¾	2.80 2¾	2¾ 2¾
Tiptop	4.40 4	4.10 4.05	4.55 4¼	5¼ 4.60
Trojan	30c 25c	40o 25c	35o 15c	15c
Union Con	37¼ 33	35¾ 34	33¾ 30	37¼ 32¾
Utah	14 12¼	13¾ 12	11¾ 10¼	12 11
Vermont Con				
Ward	1.60	1.65 1.60	1.60	1¾ 1.60
Wells-Fargo	10o 5c	5c	5c	5c
Woodville				
White Cloud				
Yellow Jacket	10 9	9¼ 8¾	8¾ 6¾	9¼ 8¾

Sales at S. F. Stock Exchange.

Friday A. M., Feb. 27.

AFTERNOON SESSION.

330 Alta ..... 3.85@3¾
450 Andes ..... 70@65c
60 Alpha 9
1745 Belcher ..... 12@12½
205 Benton ..... 2½@2.30
175 Best & Belcher 3.90
285 Bullion ..... 4.20@4¼
235 California ..... 3½@3.45
150 Con Virginia 3.60
330 G Dorado 1¼
50 Challenge 1.30
430 Caledonia 80c
160 Chollar 6
250 Con Imperial ..... 60@55c
465 Crown Point ..... 4½@4.60
50 Essex 1¼
160 Exchequer ..... 3@3.10
400 Fairfax 50c
300 Flowery 15c
323 Gould & Curry 5
2400 Golden Gate ..... 75@80c
250 Hale & Nor ..... 6½@6¾
375 Julia ..... 1.45@1.30
360 Justica ..... 1.30@1.40
260 L Bryan 45c
1000 Leviathau 10c
130 Lady Wash ..... 70@65c
455 Mexican ..... 14¼@14½
100 Mackey 20c
100 N Bonanza ..... 45@40c
425 New York ..... 40@35c
90 Occidental 1
190 Ophir ..... 17¼@17½
85 Overman ..... 6¾@6¾
265 Potosi 3.40
450 Savage ..... 5¼@5¾
155 Sierra Nevada 22
200 Solid Silver 10c
735 Silver Hill ..... 90c@1
95 Scorpion 3
250 S Utah 20c
700 Trojan 15c
400 Union Con ..... 33@32¾
1900 Wells-Fargo 5
495 Ward 1.60
655 Yellow Jacket ..... 9¾@9¼

AFTERNOON SESSION.

920 Arcenta ..... 60@65c
900 Albion 30c
100 Addenda 50c
255 Bodie ..... 8¾@9
20 Bechtel 2.05
300 Belcher 12½
100 Belmont 50c
230 Black Hawk 80c
1680 Belvidere ..... 2½@2.65
300 Chamnon ..... 50@45c
100 C Pacific ..... 3¼@3¾
800 Day ..... 55@50c
150 Dudley ..... 45@40c
150 E M Diablo ..... 1¼@1 60
200 Endowment 20c
30 Eureka Con 14
700 Grand Prize ..... 1.35@1.40
300 Hillside 1
250 Jupiter 1.80
200 K K Con 5
130 Mt Potosi 3.30
50 Metallic 2.15
100 Mammoth 1.80
45 Mono ..... 71@67½
150 Manhattan 1¾
60 Northern Belle ..... 15¼@15¾
70 Noonday 4
300 Navajo ..... 25@30c
60 N Noonday 3
1170 Oro ..... 1@1¼
500 Orient 40c
100 Paradise 50c
200 Raymond & E ..... 50@60c
200 Sierra Nevada 22
200 Silver King 7
100 S Bullwer 2
100 S Noonday 1¾
3 170 S Bodie ..... 65@60c
500 S Standard 25c
500 Syndicate 1.40
170 Summit 1
150 Tioga 2.70
220 Tiptop 4.70
170 Wales ..... 3.05@3.10

Saturday A. M., Feb. 28.

910 Argenta ..... 60@65c
55 Albion 30c
480 Andes ..... 69@70c
380 Alta ..... 3.55@3¾
370 Bullion ..... 4.10@4.20
250 Benton ..... 2.35@2.30
915 Belcher ..... 12¼@12½
350 Best & Belcher ..... 3¾@3¾
75 Black Hawk ..... 80@75c
50 Booker 60c
200 Bulwer ..... 9@8¾
150 Bodie 9
50 Bechtel 2.05
200 Belle Isle 1.05
615 Belvidere 2½
50 Boston 1.30
50 C Pacific 3¼
90 Challenge 1.65
250 Champion ..... 30@35c
100 Concordia 50c
380 California ..... 3¼@3½
20 Confidence 7
510 Con Imperial ..... 55c@60c
575 Crown Point ..... 4¾@4.65
250 Con Virginia 3.65
240 Chollar ..... 6@6¾
115 Caledonia ..... 85c@80c
200 Con Dorado ..... 1.40@1.45
200 Day 50c
25 Eureka Con 13¾
100 Exchequer 3
35 Exchequer 3.10
510 E M Diablo ..... 1.60@1.55
100 Flowery 15c
3130 Golden Cate ..... 65@60c
260 Gould & Curry ..... 5@5¼
100 Gomonda ..... 30@25c
150 Grand Prize 1.30
75 H & Norcross ..... 6¾@6¾
210 Julia ..... 1.40@1.30
440 Justice ..... 1.40@1¼
330 Jupiter ..... 1.80@1.85
50 K K Con 4.90
10 Kentuck 5
100 Lady Bryan 45c
100 Leviathan 15c
15 Leeds 60c
535 Mexican ..... 14¼@14¾
200 Mickey 15c
180 Mammoth 1¾
70 Mono 7¾
660 McClinton ..... 50@45c
20 Mt Diablo 2
225 Mt Potosi ..... 3@3.40
200 Manhattan 1¾
170 Metallic ..... 2@2.10
150 Northern Belle 16¾
1000 N Sierra Nevada 8c
200 New York 35c
200 N Bonanza 50c
110 Noonday ..... 3.95@4
700 Orient ..... 40@45c
350 Oro 1¼
205 Ophir ..... 17@17¼
130 Overman 6¾
300 Paymaster 50c
700 Pioneer 5c
280 Potosi 3.40
200 Phil Sheridan 20c
70 Silver Hill 1
135 Savage ..... 5¾@5¾
790 Scorpion 3
650 S Bullwer ..... 1.60@1¼
460 Solid Silver 10c
545 Sierra Nevada ..... 22@22¼
200 S Standard 25c
10 Syndicate 1.40
575 S Bodie ..... 60@65c
150 Tioga Con ..... 2.70@2.65
200 Tiptop 4.60
150 Utah ..... 11@11
1110 Union Con ..... 34@36¾
300 Wells-Fargo 5
200 Ward 1.60
240 Yellow Jacket 8¾

Monday A. M., Mar. 1.

280 Alta ..... 4.10@4.20
100 Alpha 9
755 Andes ..... 70@60c
975 Belcher ..... 12¾@12½
300 Best & Belcher ..... 10¼@10½
2420 Bullion ..... 4.90@5
100 Benton 2.45
550 California ..... 3.30@3¼
540 Con Virginia ..... 3.55@3¾
100 Challenge 1¼
700 Caledonia ..... 80@35c
645 Crown Point ..... 4.55@4.65
625 Chollar ..... 5¾@5¾
150 G Dorado 1.45
310 Exchequer ..... 3.40@3¼
20 Essex 5c
200 Gould & Curry ..... 5¼@5¾
1530 Golden Gate (B) 60c
105 Hale & Nor ..... 6¼@6¾
610 Julia ..... 1.55@1.45
325 Justice ..... 1.45@1¼
150 Leviathan 15c
100 Lady Wash 80c
305 Mexican ..... 15½@15¾
500 Mackey 20c
100 N Bonanza 45c
700 New York ..... 40@45c
50 Occidental 1
195 Ophir ..... 17¼@17¾
105 Overman ..... 6¾@6¾
1510 Potosi ..... 4@3.90
90 Savage ..... 6¼@6
60 Scorpion 3
750 Silver Hill ..... 1@1.10
100 Solid Silver 10c
240 Sierra Nevada ..... 22¾@23
100 Trojan 15c
65 Utah ..... 11¾@12
815 Union Con ..... 36@36¾
600 Wells-Fargo 5c
120 Ward ..... 1.65@1.70
550 Yellow Jacket ..... 9¼@8¾

AFTERNOON SESSION.

700 Albion 30c
250 Addenda 50c
2540 Argenta ..... 65@60c
200 Boston 1¾
755 Booker ..... 65@60c
900 Belmont 10¼
455 Black Hawk ..... 80@75c
365 Belvidere 3.45
270 Bulwer ..... 9@9¼
170 Bodie 9
30 Bell Isle 1.05c
200 Bechtel 2.05
650 Champion 50c
750 Concordia 50c
100 C Pacific 3¾
700 Day ..... 55@50c
200 Dudley ..... 45@40c
300 E M Diablo ..... 1.60@1¼
400 Endowment 15c
200 Grand Prize 1.35
1000 Goodshaw ..... 30@25c
100 Independence 90c
225 Jupiter 2
375 Jupiter ..... 2@1.90
100 K K Con 4
200 Leopard 15c
10 Manhattan 1¾
450 Metallic 2.15
110 Mono 7¾
40 Mammoth 1¾
5 M White 90c
20 May Belle 20c
805 McClinton ..... 65@35c
300 Mexican 14¾
20 Mt Diablo ..... 2@1¾
700 Mt Potosi 3¼
130 Northern Belle ..... 16¼@16¾
1250 N Belle Is 20c
275 Noonday ..... 3.65@3¾
500 Orient 40c
1450 Oro ..... 1@1.20
300 Paradise ..... 50@55c
100 Queen Bee 25c
100 Raymond & Ely 95c
500 Syndicate 1.40
175 S Bullwer ..... 1.90@1.85
80 South Standard 20c
650 S Bodie 75c
65 Silver King 7
100 Tioga Con 2.70
500 University 15c
120 Wales ..... 3@3.10

Tuesday A. M., Mar. 2.

120 Alta ..... 4.10@4
600 Andes 75o
140 Alpha 8¾
740 Belcher ..... 12¼@12½
280 Benton ..... 2¼@2.30
355 Bullion ..... 4.60@4¼
30 Best & Belcher ..... 10¼@10½
140 California ..... 3.45@3½
75 Con Virginia 3.65
50 Con Dorado 1.30
580 Caledonia ..... 1.40@1.45
470 Con Imperial ..... 60@65c
965 Chollar ..... 6¾@5¾
1750 Crown Point 4.55
50 Essex 75c
150 Exchequer 3.10
150 Flowery 20c
3390 Golden Gate ..... 60@70c
235 Gould & Curry ..... 5¼@5
100 G Horcross ..... 5¾@6
250 Julia ..... 1¼@1.45
25 Justice 1.35
500 Kossuth 15c
125 L Wash 75c
100 Leviathan 15c
330 Mackey ..... 20@25c
260 Mexican ..... 15¼@15
700 New York ..... 40@35c
135 N Bonanza 45c
340 Occidental ..... 1@1.10
255 Ophir ..... 17¼@17¾
85 Scorpion 3
320 Savage ..... 5¼@5¾
255 Sierra Nevada ..... 23¼@23
85 Utah ..... 11¾@12
50 Union Con 36¼
700 Wells-Fargo 5c
120 Ward ..... 1.65@1.70
245 Yellow Jacket ..... 8¾@8¾

AFTERNOON SESSION.

200 Albion 30c
770 Argenta ..... 70@75c
500 Belmont 36c
100 Bechtel 2
205 Black Hawk ..... 75@80c
380 Bulwer 9¼
100 Belle Isle 1.10
850 Booker ..... 65@75c
210 Boston ..... 1¼@1.30
200 Belvidere ..... 3.85@4
750 Champion ..... 40@45c
150 Concordia 50c
150 O Pacific ..... 3¼@3¼
355 Day 50c
150 Dudley 45c
130 Endowment 15c
100 Eureka Con 13¾
230 E M Diablo ..... 1¼@1.85
460 Grand Prize 1.30
400 Goodshaw 30c
300 Independence 90c
225 Jackson 2
315 Jupiter ..... 2.25@2.20
300 Leopard 15c
110 Metallic ..... 2.05@2
50 Martin White 90c
500 McClinton ..... 60@65c
50 Mammoth 1.70
40 Mt Diablo 23
100 May Belle 25c
30 Mono 7¾
50 Mt Potosi 4
450 Northern Belle 16¾
300 Noonday 3.65
100 Orient 50c
1200 S Bullwer 1.90
50 S Noonday 1¾
195 Sierra Nevada ..... 1.30@1.40
200 Tioga Con 2.65
100 University 16c
60 Wales 3

Wed'sday A. M., Mar. 3.

200 Alta ..... 4.05@4.10
550 Andes ..... 75@76c
30 Alpha 7¾
505 Belcher ..... 12@12½
30 Best & Belcher ..... 9¼@9¾
175 Bullion ..... 4.40@4½
150 Benton ..... 2¼@2.30
240 C Dorado 1¼
240 Caledonia ..... 1.30@1¼
400 Con Imperial ..... 60@55c
135 Crown Point ..... 4.45@4¾
70 Con Virginia ..... 3.60@3.55
50 Challenge 1.40
170 California ..... 3.45@3.40
50 Essex 1
40 Exchequer 3.15
800 Fairfax 60c
200 Flowery 20c
600 Gould & Curry ..... 4.95@5
1100 Golden Gate ..... 70@75c
105 Hale & Nor ..... 5¾@6
230 Justice 1.20
370 Julia 1.30
50 Kentuck 50c
55 Ophir ..... 17¼@17
30 Overman 6¾
40 Potosi 4
60 Savage ..... 5¼@5¾
50 Scorpion 3
50 Silver Hill 1
120 Scorpion 3
205 Sierra Nevada ..... 22¾@22¾
20 Utah 11¾
75 Union Con ..... 35¼@35¾
30 Day 50c
100 Ward 1¾
180 Yellow Jacket 8¾

AFTERNOON SESSION.

700 Addenda 60c
200 Argenta 70c
500 Albion 30c
200 Altas 5c
150 Belmont 35c
50 Eureka Con 14¾
200 E M Diablo ..... 1¼@1.70
200 Endowment 15c
270 Grand Prize 1.35
200 Gould & Curry 5¼
200 Concordia 50c
75 C Pacific 3¼
200 Day 50c
500 Dudley ..... 45@40c
330 D Standard 75c
50 Eureka Con 14¾
150 E M Diablo ..... 1¼@1.70
200 Endowment 15c
200 Grand Prize 1.35
200 Giant & O A 5¼
100 Gila 20c
300 Goodshaw 20c
100 Hillside 1¼
300 Julia 1.30
370 Jupiter ..... 2¼@2.60
350 Leopard 10c
300 Leeds 60c
400 Martin White 85c
100 Mt Potosi ..... 3.65@3¾
100 May Belle 20c
460 McClinton ..... 70@65c
100 May Belle 20c
200 Metallic ..... 1.80@2
155 Northern Belle ..... 16¼@16¾
100 Noonday 3.70
10 N Noonday 2¾
49 Noonday 3¾
400 Orient 50c
300 Oro ..... 1.60@1.70
300 Paradise 60c
300 Queen Bee 25c
200 Raymond & E 1

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	14	25	Feb 26	Apr 1	Apr 20	B Burris	308 Montgomery st
Belcher S M Co	Nevada	21	1 00	Jan 29	Mar 3	Mar 25	J Crockett	203 Bush st
Belle Isle M Co	Nevada	1	30	Jan 27	Mar 3	Mar 25	E M Hall	327 Pine st
Best & Belcher M Co	California	17	1 00	Jan 29	Mar 4	Mar 24	W Willis	309 Montgomery st
Bodie Tunnel & M Co	California	4	20	Feb 3	Mar 21	Apr 28	A F Main	309 California st
Bullion M Co	Nevada	13	50	Jan 26	Feb 28	Mar 17	J M Brazell	328 Montgomery
Caledonia S M Co	Nevada	30	50	Jan 31	Mar 6	Mar 26	R Wegener	414 California st
ChampionM Co	California	—	05	Jan 20	Mar 1	Apr 1	G C Hurlbut	625 Commercial st
Chollar M Co	Nevada	3	50	Feb 5	Mar 11	Mar 31	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	40	50	Jan 15	Feb 19	Mar 11	J Newhands	203 Bush st
Champion M Co	California	6	50	Feb 28	Apr 5	Apr 27	J Crockett	203 Bush st
Day S M Co	Nevada	5	05	Mar 2	Apr 6	May 3	J F Pew	310 Pine st
Dudley M Co	California	7	25	Feb 4	Mar 8	Apr 5	E C Masten	309 Montgomery st
El Tesoro	California	8	25	Dec 15	Mar 15	Mar 31	W H Chickering	214 Sansome st
Endowment M Co	Nevada	4	25	Mar 1	Apr 5	Apr 26	E M Hall	327 Pine st
Europa M Co	Nevada	8	10	Dec 30	Feb 3	May 6	J L Fields	240 Montgomery st
Exchequer M Co	Nevada	15	50	Jan 13	Feb 17	Mar 9	C E Elliott	327 Pine st
Gila S M Co	Nevada	6	25	Jan 15	Feb 7	Mar 9	W W Parrish	328 Montgomery st
Hale & Norcross S M Co	Nevada	63	1 00	Jan 14	Feb 19	Mar 11	J F Lightner	309 Montgomery st
Hillside M & M Co	Nevada	2	30	Feb 4	Mar 8	Apr 5	F Frankenthal	330 Pine st
Independence M Co	Nevada	5	30	Jan 13	Feb 17	Mar 9	E M Hall	327 Pine st
Indian Queen M Co	Nevada	3	15	Feb 11	Mar 20	Apr 12	G Adams	431 California st
Iowa M Co	Nevada	8	10	Jan 21	Feb 23	Mar 11	R L Thomas	411½ California st
Justice M Co	Nevada	31	50	Feb 9	Mar 15	Apr 5	A E Kelly	419 California st
Leviathan M Co	Nevada	10	25	Feb 17	Mar 20	Apr 10	F A Frisius	330 Pine st
Mammoth M Co	California	4	1 00	Feb 18	Mar 26	Apr 21	A W Rose	302 Montgomery st
McClinton M Co	California	5	25	Feb 6	Mar 12	Apr 2	W H Lent	309 Montgomery st
Metallic M Co	—	2	25	Feb 9	Mar 15	Apr 5	—	309 Montgomery st
New York M Co	Nevada	21	5	Jan 26	Feb 28	Mar 20	D L Thomas	303 Bush st
North Belle Isle M Co	Nevada	2	15	Feb 5	Mar 10	Mar 31	E M Hall	327 Pine st
Potosi M Co	Nevada	3	50	Feb 5	Mar 11	Apr 1	W E Dean	203 Busb st
Raymond & Ely S M Co	Nevada	13	25	Jan 28	Mar 4	Mar 24	W Elliott	328 Montgomery st
Savage M Co	Nevada	41	60	Feb 4	Mar 8	Mar 27	E B Holmes	309 Montgomery st
South Bodie C M Co	California	2	10	Jan 16	Feb 18	Mar 10	—	309 Montgomery st
South Bulwer M Co	California	6	25	Jan 20	Feb 24	Mar 17	W Stuart	320 Sansome st
Telfair M Co	Arizona	2	02	Feb 5	Mar 13	Apr 3	J Pentecost	702 Market st
Tellurium G & S M Co	California	21	10	Feb 24	Mar 25	Apr 20	J M Litchfield	420 California st
Yellow Jacket S M Co	Nevada	36	1 00	Feb 14	Mar 29	Apr 23	M Otey	203 Bush st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona P & M Co	Arizona	1	05	Feb 13	Apr 5	Apr 27	C E Travers	402 Montgomery st
Atlanta M Co	Utah	1	05	Dec 23	Jen 9	Apr 10	A F McCrew	420 Montgomery st
Ætna M Co	Arizona	1	05	Dec 23	Feb 13	Mar 6	J S Benear	420 Montgomery st
Albion M Co	—	1	10	Jan 15	Feb 27	Mar 26	—	7 Stock Exchange
Arizona Concentration Co	Arizona	1	10	Feb 9	Mar 17	Apr 5	C E Travers	402 Montgomery st
Cataract and Wide West Crav M & Co	Cal	2	25	Feb 2	Mar 2	Mar 22	Wm B Lake	26½ Kearny st
Elmor M Co	Nevada	2	45	Feb 16	Mar 22	Apr 12	W Willis	309 Montgomery st
Esta Buena Con S M Co	California	6	20	Feb 21	Mar 27	Apr 27	R N Brooks	509 Sacramento st
Florida Hill M Co	Idaho	2	10	Feb 25	Apr 7	May 4	R Wegener	414 California st
Gover M & M Co	California	40	10	Dec 24	Feb 2	Mar 8	W O Wilson	402 Front st
Ivanpah M & M Co	California	1	10	Jan 19	Feb 23	Mar 11	E J Friedlander	309 California st
Jackson M Co	Nevada	1	10	Feb 10	Mar 16	Apr 5	N Shaw	408 California st
Jupiter M Co	California	7	40	Jan 23	Feb 23	Mar 19	E C Masten	309 Montgomery st
Lady Emma G M Co	California	1	10	Jan 13	Feb 20	Mar 20	F R Bunker	606 Montgomery st
Last Chance M Co	California	1	05	Feb 28	Apr 10	May 3	T A White	3 Safe Deposit build'g
Leeds S M Co	Utah	1	10	Jan 17	Mar 3	Mar 31	—	7 Stock Ext
Liberty Hill Con M & Water Co	Cal	1	60	Dec 30	Jan 16	—	J W Pew	310 Pine st
Maytlower Grav M Co	California	1	10	Jan 19	Feb 23	Mar 16	J Morizio	328 Montgomery st
Mineral Fork M & S Co	Utah	2	08	Feb 21	Apr 3	Apr 24	S Purdy	331 Montgomery st
Oro M Co	California	4	25	Feb 18	Mar 26	Apr 21	—	302 Montgomery st
Phœnix	—	22	30	Jan 19	Feb 20	Mar 26	—	7 Stock Ex
Rocky Point M Co	Calfornis	2	10	Jan 14	Feb 20	Mar 11	A C Taylor	314 Bush st
Tuscarora M & M Co	Nevada	5	15	Jan 24	Mar 1	Mar 22	M P Sperling	309 California st
University G & M Co	California	5	15	Feb 10	Mar 16	Apr 6	W L Oliver	328 Montgomery st
Western M Co	Arizona	2	1 00	Jan 20	Mar 4	Mar 30	C S Curtis	203 Bush st
Wide Awake P & M Co	Arizona	9	03	Feb 11	Mar 15	Apr 3	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Ætna M Co	—	A F McGrew	420 Montgomery st	Annual	Mar 20
American M & Dredging Co	—	E Moresu	220 Sansome st	Stockholders	Mar 8
Butte Hydraulic M Co	California	L L Demery	729 Montgomery st	Annual	Mar 8
Equitable T & M Co	California	C J Collins	227 Montgomery st	Annual	Mar 22
Hale & Norcross S M Co	Nevada	J F Lightner	309 Montgomery st	Annual	Mar 10
Holmes M Co	—	E A Holmes	318 Pine st	Special	Mar 16
Northern King M & M Co	—	E A Holmes	318 Pine st	Special	Mar 13
Original Gold Hill G & S M Co	Nevada	J M Buffington	309 California st	Stockholders	Mar 6
Oro Blanco M Co	—	W O Gould	220 Sansome st	Annual	Mar 8
Quinn M Co	Nevada	T J Blakeney	1014 Palace Hotel	Stockholders	Mar 15
Senator M Co	Nevada	L Reynolds	309 Montgomery st	Annual	Mar 19
Slavonian G & S M Co	—	A F Martin	16 Front st	Annual	Mar 10
Tybo Con M Co	Nevada	W W Parrish	330 Pine st	Special	Mar 10

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	E M Hall	327 Pine st	20	Feb 26
Black Bear G M Co	California	W L Oliver	Safe Deposit Bldg	25	Feb 16
Bodie Con M Co	California	W H Lent	Nevada Block	25	Mar 1
California M Co	Nevada	C P Gordon	Nevada Block	50	Dec 22
Con Virginia M Co	Nevada	A W Havens	Nevada Block	50	Dec 23
Eureka Con M Co	Nevada	P Jacobus	37 Nevada Block	30	Feb 20
Father De Smet Con M Co	Black Hills	Tbeo Widmann	404 Montgomery st	30	Feb 24
Great Western Q M Co	California	A Halsey	312 Montgomery st	25	Feb 3
New York Hill G M Co	—	E B Lightner	327 Clay st	25	Feb 20
Ophir S M Co	Nevada	C L McCoy	203 Bush st	1 00	Jan 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Mar 12

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Feb. 26.

30 Alpha ..... 8¼@8¾
170 Alta ..... 3.20@3¾
350 Andes 70c
75 & Belcher 83
1425 Belcher ..... 12@12½
375 Bullion ..... 3.95@4
160 Benton 2.15
295 California ..... 3.40@3.35
130 Con Virginia 3.70
190 Chollar ..... 6@5¾
685 Crown Point ..... 4¼@

California Board—Latest Sales.

Wed'sday A. M., Mar. 3.			
20	Alpha	8¼	
40	Alta	3.80@3¾	
200	Andes	71c	
200	Argenta	75@71c	
150	Belcher	12½@12¼	
20	Best & Belcher	9¼@9¾	
40	Black Hawk	71c	
20	Bullion	4.55@4.45	
205	Curtis	52½@61c	
30	Caledonia	1.35	
30	California	3.55@3.60	
30	Chollar	5½@5¾	
30	Con Virginia	3.60@3.65	
150	Con Imperial	60@61c	
20	Crown Point	4.40@4.45	
30	Exchequer	3.30@3¾	
200	Goodshaw	26c	
120	Golden Gate (B)	65c	
30	Gould & Curry	5@5¼	
20	Hale & Nor	5½@5¾	
220	Julia	1.45@1.50	
60	Justice	1.30@1.27	
100	Kossuth	14c	
80	K K Con	2	
70	Lady Wash	70@76c	
100	Leviathan	15c	
30	Mexican	14½@14¾	
20	Ophir	17¼@17	
10	Overman	6¼	
20	Potosi	4@4¼	
20	Savage	5½@5¾	
30	Sierra Nevada	22½@22¼	
100	Silver Hill	1¼	
100	South Bodie	81@80c	
30	Utah	11½@11¾	
10	Union	35	
20	Ward	1.60	
85	W Comstock	15c	
100	Wells-Fargo	4c	
20	Yellow Jacket	81@8¼	
	AFTERNOON SESSION.		
1850	Aetna	6@7c	
20	Alpha	8¼	
30	Alta	3.80	
120	Andes	71@75c	
300	Argenta	70@71c	
105	Belcher	12½@12¾	
30	Benton	2.10@2.30	
20	Best & Belcher	9¼	
40	Black Hiller	77c	
20	Bullion	4.60	
125	Caledonia	1¼	
40	California	3.45@3.50	
20	Chollar	5¾	
50	Con Virginia	3.65@3.60	
200	Con Imperial	60@57c	
30	Crown Point	4.45@4¼	
30	Exchequer	3.15	
200	Enterprise	1¼	
70	Julia	1.30	
20	Justice	1.20	
120	Lady Wash	70@69c	
220	Leviathan	15@12½c	
30	Mexican	14½@14¾	
20	N Noonday	3¼	
100	N Sierra Nev	6c	
20	Ophir	17½@17	
10	Overman	6¼	
100	Orient	45c	
10	Potosi	4	
30	Savage	5½@5¾	
30	Sierra Nevada	22½@22¼	
120	Silver Hill	1¼	
150	S Bodie	85@90c	
100	Trojan	15c	
10	Utah	11¾	
20	Union	35½@35	
20	Ward	11	

Mining Share Market.

There is no seeming escape from the death-like stillness which rests upon stock transactions. The leading brokers are not making their expenses. The fluctuations in prices have not afforded a line for profit, they having been so meager. When a spurt is produced, it falls to pieces suddenly because the holders of the stock put it on the market to make sure of the first trifling advance.

The principal event of interest in stock circles is the disposal by Mr. Flood of all his Comstock mining interests to Mr. Mackay, one of his partners, the consideration being understood to be five million dollars. Mr. Flood wishes to confine his attention solely to his banking interests. The transaction exercised no special commotion in the stock market, which fact in itself is a striking comment on the position of stock business just now. A few years ago it would have been considered an indication of lose of faith in the mines by Mr. Flood, and would have occasioned a bad break. But the market is now "broke" so bad it cannot be much worse.

Mr. Mackay is now the "mining king" of the United States, if not of the world.

Dispatches inform us of a slight set back in mining stock matters in New York, occasioned by the break in the Little Pittsburg, of Colorado. This will no doubt set the New Yorkers to thinking a little, and give them an idea that it is not best to confine all their operations to one particular section. This has been the great mistake of operators here, who would not go off the Comstock, and for many years nobody would look at a mine unless in that vicinity. We have learned better now in the bitter school of experience. The New Yorkers have abiding faith in Colorado, and the collapse of a few schemes there would cause a great commotion among investors.

It may be stated in this connection, that the California mines *not* on the Board are all in a prosperous condition, notwithstanding the depressed State of the stock market.

Mr. Sutro has resigned his position as superintendent of the tunnel which bears his name, and Mr. J. W. Taylor is appointed his successor.

Bullion Shipments.*

Since our last issue, we have noticed the following bullion shipments:

Alexander, Feb. 16, $3,493.57; Feb. 18, $1,790.02; Feb. 20, $2,351.81; Ontario, Feb. 23, $7,947.56; Feb. 24, $4,372.41; Feb. 25, $3,815.76; Feb. 26, $3,687.09; Feb. 27, $3,768.21; Feb. 28, $3,352.12; Wells, Fargo & Co., at Eureka, Feb. 24, $1,235.75; Feb. 25, $1,000; Feb. 26, $2,000; Feb. 28, $3,162.22; Richmond, Feb. 24, $15,434.77; Feb. 28, $22,391.84; Horn Silver, Feb. 24, $6,000; McCormick & Co., received Feb. 24, $13,712; Feb. 25, $5,450; Feb. 27, $10,727; Feb. 28, $2,285; Stormont, Feb. 24, $7,962.38; Christy, Feb. 24, $3,608.23; Tybo Con., Feb. 26 (one week), $4,257.50; Argenta, Feb. 25, $12,667; Paradise, Feb. 26, $3,600; Feb. 28, $4,758.18; Eureka Con., for Jan., $129,600; Feb. 29 (past week), 205,975 lbs.; Hannington & Mellor, Feb. 27, $5,000; Star, for Feb., $17,492.

*Desiring to make our list of Bullion Shipments as complete as possible, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

THE total coinage of the various Mints during February was $8,169,969, of which $2,300,400 were silver dollars.

DURING the month of February 902,000 pieces were coined at the Mint in this city of the value of $2,540,000.

THE public debt was decreased $5,672,019 in February.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

ZEILE.—*Ledger*, Feb. 28: A new shaft is being sunk 150 ft from the present one. It has reached a depth of 35 ft, and carpenters are at work putting up hoisting works. Some fair-looking ore has been met with in this shaft, yielding good paying prospects.

STEWART'S SULPHURET WORKS.—The new chlorination works of Stewart & Co., at Sutter Creek are running steadily on sulphurets from the Lincoln mine, and are yielding remarkably well. There is a sufficient quantity of sulphurets on hand to last six months, and with the daily output of the mill, the prospect is that the works will be kept running for the next 12 months.

BUTTE.

WYANOTTE.—Orroville *Mercury*, Feb. 27: Eight of the 23 boxes were cleaned up after a 19 days' run. The result was $818. The above yield is one-third of a bit of 6,000 cubic yards; 225 yards are being worked daily.

MINING ITEM.—The Hendricks and Perkins mining claims, in Morris ravine, have been bonded for four months, in the amount of $500,000. The consolidated properties consist of 1,300 acres of patented land, believed to comprise some of the best hydraulic ground in the county, and the water rights, flumes, machinery, etc., now used in working the Hendricks claim. The new company is known as the Morris Ravine mining company.

FORESTVILLE ITEM.—Oroville *Register*, Feb. 28: The winter has been so cold that mining operations have been suspended most of the time during the last two months. If the snow upon the mountains does not go off with a warm rain, the prospect is very encouraging to our miners who depend for their water upon natural channels. The quartz mining prospects of this section were never so good as they are at present, and we predict for Forbesville and vicinity a celebrity as a quartz section, in the near future, unsurpassed by any portion of the county.

CALAVERAS.

MINING JOTS.—*Chronicle*, Feb. 28: A very wide and promising vein of quartz has lately been struck in the San Pedro, at Glencoe. Work is progressing steadily at the old Enterprise Con., near West Point. The new process of working the ore will probably prove successful. Sinking continues at the Champion. In this vicinity but little hydraulicing has been "indulged" in during the week, on account of "breaks" in the ditch.

MARIN.

KING RANCH.—*Journal*, Feb. 26: Is located at the foot of Tamalpais mountain. Assays of ore yielded: Gold, $54.15; silver, $7.90 per ton. Eight hundred pounds have been milled at San Francisco, with very favorable results.

SAN RAFAEL.—Several tons taken to San Francisco were amalgamated by the new process known as the A. C. Tichenor Lead Fusion furnace—that is, through hot lead, instead of by quicksilver. William Gardner, Assayer for A. C. Tichenor & Co., in his official report to President Briggs, says: "I have carefully assayed the pulp from six sacks of ore furnished by the San Rafael and Coast Range mining company, after having been run through a chamber of hot lead, and it showed barely a trace of any residum of metal. I also assayed the lead after the pulp had been run through the hot lead, and found it to have been increased or enriched thereby at the rate of $21.62 per ton of 2,000 pounds of pulp."

MARIPOSA.

MINING ITEMS.—*Gazette*, Feb. 28: The Washington is in full blast, giving employment to quite a number of men in the mine and on the surface. The No. 9 is being worked with good results. The Pool has several men employed. The rock pays from $14 to $10 per ton, with a good prospect ahead. The partiee from Oakland who recently purchased the Silver lead are pumping out the water. This is an old mine, and has produced, formerly, considerable gold.

MONO.

BELVIDERE.—*Free Press*, Feb. 20: The rich strike is now a fixed fact. Its extent, so far ae uncovered, and its extraordinary richness, place it on the list of bonanzas. Striking it in the shaft, driving 60 ft and raising on the ledge 30 ft, all in high-grade ore, with the ore extending above cast, and below not yet opened, places this mine in the front rank of the rich mines of Bodie. The ore body already developed extends from face of north drift to face of joint south drift, 113 ft. It is known to extend to the main shaft, which will make it 150 ft in length. An assay taken from the upraise went: Gold, $5,144.55; silver, $510.22; total, $5,054.77.

CON. PACIFIC.—The north drift, 400 level, has a total length of 142 ft. During the past week, stringers of quartz have been cut and the drift cut into a large vein of quartz of fair-milling grade the entire width of the drift. The south drift, same level, has a total length of 132 ft.

TIOGA CON.—The shaft is sunk 704 ft. The connection with the Syndicate is now accomplished. The ventilation is complete, the up-cast being in favor of the Tioga. It will save 523 ft of hoisting or pumping of water, and the hoisting and transportation of ore. The upraise on vein No. 3 is, in all, up 131 ft, incline measurement. The vein at this point is about three ft thick, the walls being well defined.

JUPITER.—Excellent progress is being made on the 500 level. The west crosscut from the end of the main south drift is now in 70 ft. The west crosscut from the end of south drift No. 2 is in 30 ft in favorable ground.

ADDENDA.—The new three-compartment shaft has been sunk and timbered 58 ft in the past two weeks; total depth, 189 ft.

UNIVERSITY.—The main shaft is down 357 ft. The ground is improving and growing softer, carrying quartz stringers.

QUEEN BEE.—Bodie *News*, Feb. 26: The north drift from the cast crosscut, 400 level, has now a total length of 136 ft. The ledge improves as the drift advances. The whole face of the drift is in ore. The ledge porphyry and foreign matter in this drift is pinching out and the ore body increasing.

KING BEE.—The double-compartment shaft is down 100 ft. Drift on lode No. 1 shows a ledge three and one-half ft wide of good ore, with clean-cut walls.

BOOKER.—Still drifting on the vein at the 300 level. The ledge is strong, and carries three ft of good milling ore; improving as the drift is advanced. Work at the 400 level is being pressed. The drifts on the ledge, both north and south, have been advanced 40 ft on each. The vein is of a good quality of ore, fully equal to that of the 300 level.

SOUTH BULWER.—Sinking the main two-compartment shaft; total depth, 524 ft. For the past few days have been carrying down the timbering close to the bottom, lowering the pump and putting in additional length of air pipe. The Burleigh drills work well, and sinking is now progressing rapidly. The formation is favorable for sinking, the bottom being in quartz and clay, indicating the near approach to a ledge.

ORIGINAL SUMMIT.—Still drifting on the vein at the 100 level. The vein continues very rich, and increases in size as advance is made. The prospects of this mine are exceedingly good.

SOUTH NOONDAY.—The double-compartment shaft has reached 153 ft, at which point a station has been cut out and crosscutting east and west commenced. The east crosscut is in 15 ft. Expect to cut the ledge on this level in 35 ft. The west crosscut will be run to crosscut the Sandbank ledge. It is expected the ledge will be cut in 75 ft, and a rich body of ore opened up on the upper levels and at the worke on the surface.

DUDLEY.—At a distance of 200 ft from the shaft in the main west crosscut, 500 level, an immense flow of water was struck. An attempt was made to hold it, with the pumps running 200 strokes per minute. The water so gained that it was found necessary to abandon the 500 level, moving the pump 20 ft up the shaft. The water continued to gain, and the pump was moved up 20 ft more. The pump then broke, and it was taken to the surface for repairs. When it was placed back in the shaft, the water stood 95 ft above the station. Since then, with the pumps running 90 strokes per minute, a gradual gain has been made upon it, the water on Feb. 27th being but 40 ft above the 500 station floor. The head of the water has evidently been tapped, and it will be but a few days before work will be resumed in the 500 level.

MARYLAND CON.—The shaft has a depth of 500 ft, the bottom in clay and quartz, giving good assays. At 460 ft a fine ledge was cut, of good milling ore, four ft wide; at the 550 level a station will be opened and crosscuts started for the several ledges already cut in the shaft and upon levels.

HARRINGTON.—The winze in the tunnel has reached a depth of 105 ft; entire bottom in vein matter, and running through it are stringers of ribbon quartz, showing free gold.

NEVADA.

ALPHA.—Grass Valley *Union*, Feb. 29: The new shaft has reached 120 ft, at which point a new level will be opened. The ledge averages 18 inches in size, and shows well in free gold and coarse sulphurets. The rock gives every appearance of yielding a good return when a crushing is made.

ROCKY BAR.—A clean-up of 87 lotde of tribute rock yielded $3,007, or over $34 per load. This is fully up to the average of previous crushings.

DEADWOOD.—*Transcript*, Feb. 27: The Directors report that the main incline has been sunk 175 ft further, and a new level, which was started at a point 420 ft from the top of the incline, has been driven 300 ft during the past year. Good rock was obtained from the 320 level, which has been driven to a point 310 ft from the incline. Some 1,041 tons have been milled, yielding $20,991.32 net, or an average of $25.93 per ton, of which the sulphurets gave in value about 7½%. The mill cost over $10,000.

CUNNINGHAM.—Has been pumped by a party of New Yorkers and men put to work. A lawsuit will follow to dispossess them.

MURCHIE.—There has been reduced at the mill during the year 10,103 tons of ore, the average yield of which has been $12.31 per ton. The gross yield has been $124,420.04, of which $57,393.65 was free gold, and $67,026.39 from sulphurets. The amount of sulphurets saved has been 5.33⅓ of ore crushed.

MINING NOTES.—Grass Valley *Union*, Mar. 2: The Idaho has declared a regular monthly dividend for February of $1 per share, aggregating $3,100. This is the 127th regular dividend. The product of this mine for February is $23,700, an increase of $3,000 over January. The Godfrey gravel mill has again started up, after being kept idle for some time on account of the frozen ditches failing to give a supply of water. Forty miners are engaged in the mine in taking out gravel, which is run out through the tunnel and dumped directly at the mill. The Vulcan, adjoining the New York Hill on the west, is putting up steam hoisting works. The shaft on the mine has cut through two ledges, but when the steam pump starts up it will be sunk deeper to cut the under ledge, which is considered the richest. The incline of the Rocky Bar is being sunk for another level. It is 20 ft below the drain tunnel that tape the present lowest level. A crushing of rock from the Ford & McDonald, on New York hill, this week, will yield handsomely, as the rock is now richly in free gold. Work on the Bulldoser, on Osborn hill, will soon be resumed.

TULARE.

MINERAL KING.—*Times*, Feb. 28: A bar of bullion run from 18 pounds of rock weighed 11 pounds and 6 ounces and assayed upwards of $120 to the ton in silver, 70% lead, which, at the present price of lead, is equal to about $85 per ton. It came from the shaft which is down 16 ft. The drift shows a face of over two ft of solid ore, which will assay over $200 per ton.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Mar. 3: On the 2100 level the ore body east of the Hardy vein prospects exceedingly well. The winze from this level, 40 ft south of the main east drift has a depth of 40 ft. On the 2200 level the north drift along the Hardy vein has a length of 125 ft. The south drift along the same vein has a total length of 124 ft. The north drift along the same vein, on the 2300 level, has a length of 138 ft. The joint Mexican crosscut on this level is in a heavy quartz. The highest assay obtained is $38. Length of crosscut, 100 ft. The main north drift on the 2500 level is in 70 ft from the incline. The main incline is 55 ft below the 2500 level.

BELCHER.—The winze from the 2760 level is down 22 ft. On the 3000 level the drift south has 50 ft to run to reach the parallel of the crosscut east on the 2760 level.

CALIFORNIA.—Crosscut No. 2, 850 level, is in 30 ft. The crosscut running west on the 1500 level is in 80 ft. From the east crosscut on the 2100 level, and 70 ft from the north drift, a raise has been started to prospect the ore vein on the 2000 level in the drift north. The main lateral drift south on the 2300 level has a total length of 180 ft.

UTAH.—The incline is down 200 ft on the slope below the 1750 level. The south drift on the 1750 level is in 185 ft and in vein porphyry.

YELLOW JACKET.—West crosscut, 2700 level, has been cutting ground which is getting softer and admitting of better progress. The north winze is 210 ft on the slope below the 2700 level.

HALE & NORCROSS.—Total depth of the winze, 165 ft. Breadth of vein is being disclosed on the 2200 level by the crosscut west, which has been extended 256 ft and has not reached the west wall yet.

JULIA CON.—The south lateral drift, 2000 level, has reached a length of 135 ft. The winze from the 1800 level is down 235 ft on the slope below that level.

SIERRA NEVADA.—The principal work is in the north drift, 2400 level, which is in 348 ft.

OVERMAN.—Crosscut No. 2 east, 1900 level, is 105 ft in length and is passing through a good-looking formation of porphyry, clay and quartz.

CROWN POINT.—The winze below the 2700 level, 120 ft on the slope. The joint Belcher crosscut east, 2700 level, is in 150 ft.

SAVAGE.—The incline has been pumped out. The drift for the incline from the 2400 level of the C. N. S. shaft is 450 ft in length.

ALTA AND BENTON.—The south drift, 1050 level, into Alta ground, is 315 ft in length, and that north into Benton ground, 448 ft in length, and both continue to skirt the vein.

UNION CON.—The shaft and east winze from the 2400 level are both being pushed for the 2500 level. The southeast drift, 2400 level, is 258 ft in length. The output of ore has been increased to 250 tons per day.

CHOLLAR.—The west drift has reached the point whence connection is to be made with the Hale & Norcross winze from the 2200 level of that mine and the connecting drift started. When the connection is made better ventilation will be secured. Fifty ft of quartz, yielding very fair assays, is in the west drift.

CON. VIRGINIA.—The stopes on the 1550 and 1750 levels are yielding an average of 145 tons of ore per day. The joint California east crosscut on the 2200 level is in 105 ft. The C & C shaft is 55 ft below the 2200 level, the bottom in vein matter.

GOULD & CURRY.—The raise from the 1700 level to meet the joint shaft is up 165 ft. The G. & C. and B. & B. shaft is down 927 ft.

BEST & BELCHER.—The east crosscut, 2000 level, joint with Con. Virginia, is in 150 ft east of the bottom of the winze.

MEXICAN.—The joint Union Con. crosscut, on the 2300 level, is in 120 ft.

CON. IMPERIAL.—The north drift, 2300 level, is now in 70 ft. The joint Alpha winze from the 2600 level is down 250 ft on the slope.

BELMONT DISTRICT.

BELMONT.—*Courier*, Feb. 21: The crosscut running west from 300 level is in the hardest slate ever found in the mine. The No. 3 raise was advanced through a vein of quartz showing milling ore.

SAN ANTONIO.—The crosscut on 450 level is in from foot of incline 82 ft, cutting through seams of quartz and low-grade ore.

EUREKA DISTRICT.

EUREKA CON.—*Sentinel*, Feb. 20: First level—Winze sunk 52 ft; drift bottom of winze in 12 ft. Third level—Northwest drift in 146 ft. Seventh level—Northeast drift in 152 ft; north drift in 128 ft; southeast drift in 103 ft; winze in 30 ft. Eighth level—Southeast drift in 150 ft. Ninth level—upraise 26 ft. Little teuth level—East drift in 169 ft. Tenth level—Drift en quartz ito in 37 ft. Eleveuth level—North drift in 840 ft.

HAMBURG.—Stringers of ore have been encountered and a vein 12 inches in thickness was struck at the depth of 792 ft that assayed $77 in lead.

RICHMOND CON.—The new chamber (No. 15) discovered on the 400 level, under the Tiptop ground, is opening well; a large body of good ore is exposed, and a connection in ore for the whole distance of 380 ft has been made between this chamber and No. 13 on the 600 level. The ore is still making up in the back of No. 15 chamber. In the bottom of No. 15 chamber there is a very fine breast of rich ore exposed, and all the other chambers are opening out well.

JETT DISTRICT.

JETT CON.—The Centennial shaft has a total depth of 60 ft. At a point 58 ft deep the footwall dropped from 40° to 70°, and the ledge changed its dip. The ore shows well in the bottom of the shaft.

WINNEMUCCA DISTRICT.

OHIO.—*Silver State*, Feb. 27: They have 130 ft drifts, and are sinking on the ledge in two places. One of the shafts is down 60 ft on the vein, which is 14 ft wide. The ore is rich, almost every seam in the quartz being thickly coated with horn silver.

ARIZONA.

MONITOR.—*Pima County Record*, Feb. 21: The prospect shaft is in solid ore assaying from $60 to $300. For over 1,000 ft bold croppings trace the course of the ledge, and have been cut in several places showing large bodies of ore worth from $100 to $1,000 per ton.

DOS CABEZAS ITEMS.—The Juniper gold mine has a shaft 80 ft in depth, all in good free milling ore, assaying up in the hundreds. About 80 tons of ore are now on the dump. The lowest of this lot will average $50. Adjoining the Juniper is the Madden, also gold, with a shaft of 60 ft, showing ore all the way. Next is the Greenhorn, which has two shafts sunk, having a depth of 10 ft each. The Bear Cave is one of the finest claims here, its shaft of 40 ft showing a magnificent body of ore. These are western extensions of the Juniper. The eastern extensions of the original location show equally good ore. These are the Murpby, the Pat Price, the McConnelly and MacOorrie. Still west of the Bear Cave, is the Silver Cave South, a ledge 100 ft in width.

SILVER DISTRICT.—Six miles northwest of Ewell springs is Silver district, where some 40 oddlocations have been made, among which are the El Dorado North and South. A union shaft on the two mines is down 80 ft, all in good ore.

EVANS ITEMS.—The Producer has a shaft 26 ft deep, showing 30 inches of black sulphurets and chloride ore assaying from $300 to $1,000. The main shaft of Conquest is down 24 ft, showing chlorides, sulphurets and native silver. On the Mountain View, 26 ft has been sunk; has four ft of ore running from $104 to $500.

GLOBE ITEMS.—*Silver Belt*, Feb. 21: On the Mexican the ledge is 36 ft wide at a depth of 106 ft. At the Seminole a new shaft is being sunk 260 ft west of the main shaft, and from the top down, ore of a very high grade is found. It is bird'e-eye porphyry, carrying chloride, sulphuret and malleable silver.

CENTRAL.—On the Central rich born and wire silver ore have been taken out. Twenty tone of ore on the dump averages $60 silver to the ton. The main shaft has been sunk to a depth of 50 ft and shows a good ore body.

MILWAUKEE.—A shaft on the Milwaukee has been sunk 25 ft and shows very fine ore.

NUGGET.—Messrs. Chilson & Drew have found an excellent ledge of silver ore 300 yards above the Nugget mill site. The shaft has been sunk 24 ft all in ore, which is of value to justify milling. An assay of the general average ore went over 00 ounces in silver per ton. The deeper it is sunk the more valuable becomes the ore. At present they are drifting, and the ore is of a high character. Seventy-eight pounds of nuggets taken out were worth from $4 to $3 per pound.

PILGRIM.—An 8 or 10-inch streak has been struck in the Pilgrim which runs as high as $700 and $800. The ledge is about five ft in width, and will mill, without assorting, about $100.

MINING ITEMS.—*Miner*, Feb. 27: Never within the last decade has the mining outlook for northern Arizona attained such a degree of brightness or prosperity as at present in regard to big strikes in quartz and placers. The Arizona Central (Vulture) is to have 100 stamps erected, and water furnished through iron piping from the Hassayampa, a distance of 12 miles. The Cavo creek mines are to have suitable machinery for their proper development. At Tiptop a good road has been made from mine to mill, the ledge opened so that a large quantity of ore can be secured with the services of a reduced force, and the prospects are exceedingly good for a bounteous yield of bullion. At the Tiger the shipments of silver go out by the thousand daily. In Bradshaw basin the 10-stamp mill of Messrs. Bowen, Knowles & Co., is ready to start up on Prince ore worth $400 to the ton. At the Peck the coming summer will see more bullion produced from the district than ever heretofore. The Black Warrior is showing fine bodies of ore. The Prince has been inspected by Prof. Raymond, and an increased number of miners put to work. On Turkey creek the Masterson and other mines are yielding very superior quality and quantities of ore. At Smithville the Mammoth shows, at 150 ft below the surface, from five to six ft of free milling gold ore. The mill is kept busy on this. In the Black hills the immense copper deposits show a most wonderful amount of ore. At Coyote Holes Gov. Powers has a large force of men developing a number of fair prospects. C. C. Bean is busy prospecting some of his gold, silver and copper lodes. The quartz mines, together with the placers of Lynx, Hassayampa, Antelope and Black Canyon creeks, have given mining matters an impetus hardly ever surpassed anywhere. With the additional stamps that are to be put up in this county within the next six months, about 150, the bullion product that follows will easily thribble that of any past period.

COLORADO.

TROPIC.—*Register-Call:* Ore yielding $500 in silver, gold and copper, per ton, has been uncovered in the main shaft at a depth of 200 ft.

MACK TUNNEL.—Work is progressing on this tunnel. North of the entrance, ex-Mayor Hartman has a force of miners at work in the east shaft of the Lucerne lode. The Lucerne company are developing their portion of that vein by means of a main shaft and crosscut.

HUKILL.—Has a four-ft vein of ore in the lower level of the shaft.

FREEMAN.—There are two veins in the bottom of the first shaft east of the discovery, and through which present explorations are made. The last lot of ore treated at the Boston & Colorado smelting works, yielded a trifle less than $90 per ton.

VIRGINIA CITY.—Georgetown *Courier*, Feb. 19: This mine is located on Bard creek, and has a mammoth lode of decomposed feldspar carrying chloride of silver. The body of milling ore is from six to ten ft in thickness, and assays from 40 to 800 ounces in silver, an average of over 100 assays being about 200 ounces per ton. A shaft has been sunk 65 ft, and a level is being driven from the bot-

CONTINUED ON PAGE 156.

Our Fresh Water Fishes.

[By W. N. Lockington.]

Comparison of the Fresh Water Fish Fauna of the Pacific States with that of the Rest of the United States.

The fresh water fish fauna of the Pacific States is in many respects remarkable, but more eo from the absence of types usually abundant in rivers and lakes than for the presence of any characteristic forms. In this respect it offers a marked contrast to the marine fish fauna, which contains a large numbcr of peculiar genera, and one family, the *Embiotoeidæ* or *viviparous* perch, which hae only one representative elsewhere.

In this compartive poverty of our fresh water fish fauna, we have at tbe same time an evidence and a result of the comparatively modern age, in a geological sense, of the entire coast. There bas not yet elapsed sufficient time for the evolution of highly specialized forms, and the migration of Eastern species, except as assisted by man, is almost precluded by the double barrier of mountains, with the intervening desert basin, that must be crossed by an invading form.

The total number of fishes mentioned in Prof. Jordan's "Catalogue of the Fishes of the Fresh Waters of North America," (1878) is 665. If from this we deduct about 40 species not occurring within the limits of the United States (excluding Alaska, as geographically outside), and about 106 speciee now believed to be doubtful or synonym, we shall have left 519 species. If to this we add the species mentioned in later writings of various naturalists, we ehall have a total of about 540 species, as an approximation to the number of forms occurring in the fresh waters of this country.

In this enumeration the Salmonidæ, Cyprinodontidæ and Gasterosteidæ or Sticklebacks are included, while the Gobiidæ, Belonidæ, etc., eome species of which ascend fresh waters from the sea, are excluded. Out of 12 Marsipobranchia, 5 lampreys and a hag or myxine occur on the Pacific coast.

Of the six or seven Acipenseridæ or Sturgeons, we have three or four; hut we have no *Polyodon* or Paddlefish, no *Lepidosteus* or Bony Pike, no *Amia* or Bow-fin, no *Anquilla* or Eel; and not a single representative of that large family of fishes, the Siluridæ, which includes the catfishes, horned-pouts, etc., of North America, and a very large proportion of the rich fish fauna of South America.

Twenty-nine species of this family are known to occur within the limits of the United States, and one of them, *Amiurus albidus*, a native of the streams from Pennsylvania to North Carolina, has lately been introduced by tbe State Fish Commissioners into California, and is thriving so well that it is already tolerably abundant in the market.

All the Siluridæ are tenacious of life, and can bear with impunity a lengthy deprivation of water. Some of the South American species, living in districts where the ponds and rivers are liable to dry up in eummer, are capahle of taking overland journeys in search of water.

I once purchased a small *Amiurus albidus*, apparently almost dead, wrapped it up in paper, kept it in my coat-pocket for four hours, and then found it alive. After a few minutes in a bucket of water it became quite lively.

Of the Catostomidæ or Suckers, so called from their usually thick lips and downward-directed mouth, about 56 species have been described as occurring in the United States, but of these only eight, including two species of *Chasmistes* lately noticed by Prof. Cope as occurring in Klamath lake, are credited to the Pacific coast.

This group is almost peculiar to North America, the only exceptions being a genus (*Myxocyprinus*) of one known species in China, and the *Catostomus rostratus* of Eastern Siberia.

The large family of the Cyprinidæ, including the various forms of carp, dace, chub, roach, minnows, etc., has, even after deducting all doubtful species, about 190 representatives in the United States, but of these only 24 or thereabouts are on record from the Pacific elope. Among these is the *Gila grandis*, the "Pike" of the markets, one of the largest of the family, attaining a length of four fest.

We have no fresh-water herring or moon-eyed herring *(Hyodon)*, and although at least four speciee of emelts *(Microstomatidæ)* occur in ealt water, it is not on record that any of them ascend the rivers.

In Salmonidæ, including the Microstomatidæ, our waters are especially rich, eince no less than six trout *(Salvelinus Salar), a Coregonus* or white fish, and five species of anadromous salmon *(Oncorhynchus),* occur in various parts of the Pacific region; making a total of 12 species out of about 27 found in the whole of Uncle Sam's domain.

The *Characinidæ*, a South American family, has a single outlier in Texas, but is not represented here; *Percopsis* is not found east of the Mississippi basin; the Esocidæ, or pikes and pickerels, oontine their voracity mainly to the same region, none of their eix or seven species reaching Pacifio etreame or lakes, except in Alaska; no epecies of the *Amblyopsidæ*, or blind fishes, or of the *Umbridæ*, or mud minnows, has yet heen found on this coast and even the large tribe of Cyprinodontidæ, or tootbed minnowe, of which about 35 good species are known to occur in tbe country, has but two representatives on our coast, and they extend only to the southern part of California.

The *Atherinidæ*, or silversides, have tbres species on the Eastern coast and at least two on the Westsrn, and though the Western ones do not figure in Jordan's check list, they ascend our larger rivers.

The only known species of *Aphododeridæ*, or pirate perches, is Eastern; so ie *Elassoma*, which eome make a family; and the Percoid euh-family, *Centrarchidæ*, affords our fresh waters only one out of a total of 51 valid species.

The four speciee of that division of the Percidæ, now known ae Labracidæ, are Eastern, as are the three true Percidæ. The Etheostomatoid division of the same good old family, although it has some fifty-six species in the United States, is not represented on this coast; no member of the *Sciænidæ*, so far as ie known, occurs in our fresh waters; and even the Cottidæ or bullheads give us only two or three out of fifteen or sixteen valid species.

We have no Gadoid or Chromid in our rivers, and three or four stickle-hacke (Gasterosteidæ) do not enrich us much in the way of food fishes.

Altogether, out of the total of about 540 recognized species, helonging to the families herein mentioned, only about 64 are yet known on the Pacific coast, taking that term as comprehending the region between the Sierra and the eea, exclusive of the great interior basin between the Sierra and the Rocky mountaine.

Among the more exclusively marine families, the Gohioid *(Gillichthys mirabilis)* is found in the mud of tidal creeks, and one or more of the species of Syngnathus have been taken in fresh water.

A Long-Neglected Mining Section Coming into Notoriety.

It bas been eome time eince Nevada witnessed within her borders a mining excitement of much importance. Next. to the Comstock, White Pine was the greateet we ever had. Since then there has been no particular rush to any section of the State. Eureka grew up on its own merits, without much ado, or capital, or outside help. Tuscarora, during the early days of the Grand Prize mine, drew together quite a community, as did also tbe discoveries in Paradise valley. Bodie got up a boom something after tbe old style, and took from ns a good deal of muscle and energy; but being just over the California line, it cannot he claimed to have besn a Nevada excitement. There is a section, however, within onr own borders, which is just now attracting a large ehare of public attention. We allude to the Columbus region in Esmeralda county. The Northern Belle was a dividend-paying mine for years, and we are told that there are several properties in the same neigbborhood which promise to he equally productive. Also, the Northern Belle has recovered its ledge at greater depth, and, it is said, is about entering upon a new era of prosperity. The Mount Diablo, Mount Potosi and Metallic are among the new minee which are just coming into prominence. The first named is claimed to have a million or two in sight. The prospects, all around, are spoken of as heing all that could he desired. Experts and mining men from San Francisco, the Comstock and Bodie are flocking to the new Dorado in great numbers. The principal town is Candelaria. Its population is ahout 400, and is daily growing. Several heavy mercantile firms are preparing to locate there. The conntry is one of the roughest and most desolate eections of the State; but being rich in the precious metals it is sure to draw. As things look at this distance, Candelaria is destined to furnish the next mining excitement in Nevada.—*Eureka Sentinel.*

The Mining Debris Question.—Tbe forthcoming report of the Public Land Commissioners, who visited California last autnmn, will contain the following interesting passage on the subject of mining debris: "The importance of the mining debris question is set forth in the testimony accompanying this report. It will appear therefrom that a eerious and increasing conflict exists in California upon this subject, between the miners and agriculturists. It would also seem to be a question falling within the legitimate scope of Congressional aotion. The United States still own 40% of the lands in that State, a large portion of which contain minerale. Facilities for running off their tailings are indispensable to the successful working of these mines, and the Government could ecarcely expect to sell the eame to purchasers and yet deny the necessary conveniences for their operation. But it is claimed that such unrestrained debris facilities destroy the agricultural lands on the lower portions of the streams, and that by the shoaling of rivers and bays navigation is being destroyed and commerce restricted. It should satisfactorily be determined whether these allegations are true, and if so, whether there is an appropriate or just remedy. This commission has enjoyed neither the requisites nor facilities for an intelligent solution of the important question, and it is clear that it falls within our jurisdiotion, hut it is closely allied to the future disposition of the public domain in mineral localities, and it is of such growing importance that we feel warranted in recommending the creation of a properly organized commission, clothed with authority to ascertain the faots and to propose to Congress an adequate remedy for any evils that may be found to exist, which shall settle this vexed question with even-handed justice to all parties concerned."

A Geological Curiosity in the Vicinity of Philadelphia.

The geological wonder known as the Ringing rocks, says the Reading (Pa.) *Times and Dispatch*, ars in Montgomsry county. Ringing hill, as the people there call ths eminence on which the celebrated rocks are found, is on the farm of Abraham Mensch, in Pottsgrove township, three miles northeast of Pottetown. The Ringing rocks cover a space of ahout three-quarters of an acre. In thie tract, boulders are piled upon boulders of all shapes and forms, and so promiscuously arranged that considerable agility is required to walk over them without falling. As one steps from rock to rock, a ringing sound, produced by the nails in the hoot-heels, is plainly heard. On tapping the stones with a hammer quite remarkahle acoustic properties are revealed. Some of them give forth a rich, full tone which would prohably vie with the best bell metal if the stones were fasbioned into hells. One of them in particular, from its depth of tone, is known as the State House bell. This was at one time among the largest of the rocks. It has been broken off, however, but etill has preserved its strong, full toue. The general sound produced by striking the smaller stonee resembles that of a blacksmith'e anvil, some having a littlo clearer ring than others, and no two sounding just alike. In passing from one to another of the larger rocks, one is reminded of the tapping of car wheels by the train inspectors.

We have not heard any satisfactory explanation of the cause of the ringing or bell-like sound of these rocke. Some say it ie owing to there heing a cavern under them. Thie, bowever, can have nothing to do with it, as when the rocks are removed they etill have the same sound. One large and sonorous boulder was taken to the Centennial, and attracted a great deal of attention there. Another was sent to England a year or two ago. There is prohahly a metallic eubstance in this group of boulders to whicb the ringing sound may be attributed. We havo not heard, however, of any geological analysis being made. Half a mile east of the Ringing rocks, and in the same range of hills, there is another group of bouldere which is much visited. Here a lofty pile of rocks surmounts a cavity of considerable depth, the whole being known as the Stone House. Near hy the Stone House is a huge boulder, some 15 or 20 feet high, which, from its peculiar contour, is called the Hay Stack. Besidcs their acoustic qualities, there is another singular circumstance about the Ringing rocks which visitors rarely fail to notice. Many of them have very strange marks or indentations. At some points these resemble the track of a horse's hoof. Others are like the track of a wagon. Some of the larger indentations are said to resemble an elephant's foot, and *fac similes* of the human foot are claimed to be found among the smaller ones.

Coinage.

The following is a statement of the coinage at the United States mints during the month of January, 1880:

GOLD COINAGE.

	Value.
Double-eagles	$1,360,000
Eagles	2,175,000
Half-eagles	3,532,500
Total gold pieces	$7,067,500

SILVER COINAGE.

	Value.
Dollars	$2,450,000

MINOR COINAGE.

Five cents	$300
Cents	58,200
Total minor coinage	$59,000
Total coinage	$9,576,500

How Indians Get Their Gold.—A Bodie *News* reporter noticed eeveral squaws panning out gold dust in emall pools of water formed by the damming up of the flow from the Standard mine. Some of them were quite expert, handling the pan like an old gnlch miner. One of the squaws finished washing out a pan of dirt while the reporter was present. A emall quantity of very fine gold, mixed with sand, remained in tbe pan after the dirt had been washed off. From eome hiding place in her tatters she took out a piece of buckskin with a emall amount of gold and black sand tied up in it. This she untied, placed in it the dust ehe had just panned out, and returned it to its former hiding place among her rags. Looking around to see where the dirt came from, several Indian braves and hoys were observed digging and scratching in the old dumps lying near by. The braves get the dirt and the squawe do the panning out.

Among its many objects of historical interest, the Paris Astronomical Museum contains a pair of Mercator'e glohes, dating from the middle of the sixteenth century. That figuring the earth is the first on which meridiane of longitude and latitude were laid down. It is reported that the great eqnatorial lakes of Africa are all to be found on it.

New District.—Inyo county has always great attraction to old mining adventurers. The ores are very rich and intractable. Just now there ie a new excitement. A new district has been formed under the name of Breyfogle, at a point about 20 miles north of Panamint, in the same range. It is well supplied with wood, water and grass.—*Esmeralda Herald.*

Glimpses of the Rocky Town of Penryn.

Tbe town of Penryn, Placer county, is prettily located on a slops of the foothills, and commands a fine visw of the undsrlying valss and hillocks stretching away toward the vast expanse of the Sacramento valley. Sunset as seen from the village on the day I was tbere, was one of the prettiest sights imaginable, the last rays hreaking through a fleecy cloud and lighting up the cliffe and little valleye in a manner to present the rock, trees and many-hued foliage in the most striking contrast poseible. Although the town is populated by workers—men who delve in the granite quarries (the principal industry of the place)—it would seem to he a delightful locality in which to while away the daye in peace and quiet, and to study the beauties of nature.

There are many small valleys in the vicinity of the town, in which are snug-looking, psaceful homes, with the stoutest, rosiest and healthiest looking children ecampering ahout. In fact, it appears as if such a thing as sickness is unknown there. The rain keeps the place washed and free from all dirt and filth, while the gravelly, quartz-like formation of the hillsides prevente the accumulation of mud.

In the neighborhood are several promising quartz ledges, while one citizen is prospecting what he helieves to be ono of the finest iron mines on the continent. A company of Chicago capitalists recently purchased the Schnabel mine and mill, located between Penryn and Newcastle, and are now working it. The price paid wae some $200,000.

Vine culture is getting to be a prominent industry ahout there, and bids fair to assume considerable proportions within a few years.

The people of Penryn do not look with much favor on the Folsom branch prison, as they fear that the State may be ahle, by the aid of cheap labor, to greatly interfere with the business of individuals engaged in granite quarrying, if, indeed, the effect should not he to drive the latter from the market entirely. This is a matter of no little concern to such towns as Rocklin and Penryn, which are kept up by their granite industries. The Penryn quarries are among the most extensive on the coast and the quality of the rock is unexcelled. At the present time there is a fair force employed under the superintendency of Mr. Griffith, who has recently erected a large and heautiful building, which is used hy him as a etore. Tbe building would attract attention in any city.

Large quantities of stove-wood are shipped from Penryn to Sacramento, embracing live, black and white oak, pine, etc. Excellent wood is delivered at the station for from $4 to $4.50 per cord.

There is an excellent public school in the village, and there is a sufficient number of pupils to warrant the employment of two teachers. —*Cor. Sacramento Bee.*

A Rival Project to the Simplon Tunnel.

As a rival project to the Simplon tunnel, the tunneling of Mont Blanc is proposed as an alternative which possesses several decided advantages over the Simplon route, which was thought to furnish the best practical routo from Paris to Brindisi, by way of Pontaclier and Lausanne. The new project is pronounced to he entirely feasible hy Frenob engineers who have proposed it, and ie said to be receiving favorable consideration. Contrary to general opinion on the snhject, the tunneling of Mont Blanc is declared to he an easier undertaking than that of the Simplon; the estimates of cost for executing the work heing, in the case of the Simplon, 136,000,000 francs, and in the case of Mont Blanc only 75,000,000. Furthermore, it is claimed that the Mont Blanc tunnel will make the journey from Paris to Genoa 97 kilometers shorter, and from Paris to Milan, 44 kilometers shorter than by the proposed Simplon route. The location of the tunnel, which meets with favor from its advocates, is said to be from Chamounix to Courmayeur. Our authority does not go into further details; but the project has met with eome remonstrance on sentimental grounds. We reproduce the following affecting linee, which vividly recall the picture of Mark Twain weeping over the grave of Adam: "The audacity of modern engineering has culminated in a projected attempt on Mont Blanc. It is bad enough that the once virgin eummit should be annually defiled by cockney feet; but that the awful mysteries of its rocky foundation should be invaded by ewarms of rude 'navvies' is past belief, yet it is eeriously contemplated."

A recent course of experiments made to determine the heating power of gas showe that one cubic foot of ordinary 16-candle coal gas will develop 318 heat units, while water gas will give only abont 136.6 heat units per cubic foot.

A Maryland genius has invented a flexible lining for kerosene lamps, which, it ie claimed, greatly diminishes danger in case of breakage, and renders the lamp less liable to explosion.

If the work of exploring and development had been pushed in the Marquette iron district, the region by this time would he in a position to produce at least 2,000,000 tons of ore.

Australia has supplied England, during the last five years, with $131,738,000 in gold coin and bullion.

Copper Industry of the United States.

We have received the following from Messrs. F. W. Heyne & Bro.:

STATEMENT OF THE STOCK, PRODUCT, CONSUMPTION AND EXPORT OF COPPER IN 1879.

Stock, January 1st, 1879, estimated.....	17,000,000 lbs.	
Product, at Lake Superior.....	40,000,000 "	
" at Baltimore, North Carolina, Vermont Smelting Works.....	6,000,000 "	
Total.....	63,000,000 "	
Consumption, averaging 3,500,000 lbs. per month.....	42,000,000 lbs.	
Export.....	13,500,000 lbs.	
Returned.....	2,500,000 "	
	11,000,000 "	
	53,000,000 "	
Stock, December 31, 1879.....	10,000,000 "	

There being no control in regard to stock and consumption, it is difficult to form an estimate with any degree of certainty. From January 1st to end of May, 6,000,000 lbs. were exported from the old stock, at least 9,000,000 lbs. went into consumption, and about 2,000,000 lbs. were left in the hands of speculators; the stock on January 1, 1879, could, therefore, not have been less than 17,000,000 lbs.

The consumption has been very large during the last four months of 1879, and is estimated to have been about 5,000,000 lbs. per month; an average of 3,500,000 lbs. per month is, therefore, not too high.

Taking the consumption for the next five months, January to May inclusive, at 4,000,000 lbs. per month would amount to		20,000,000 lbs.
We have against that:		
Stock, January 1, 1880.....	10,000,000 lbs.	
Receipts, per rail, from Lake Superior.....	4,500,000 "	
Receipts from Baltimore, North Carolina, Vermont, etc., Smelting Works.....	2,500,000 "	
	17,000,000 "	
To be provided for by importation from England.....	3,000,000 "	

Astoria Coals.

The Washington correspondent of the *Standard* says: Mr. Hare, of Astoria, is still here and is doing good work in the interest of tin rebate bill. The specimen of coal he brought from Clatsop county was recently analyzed, as the following letter explains:

SMITHSONIAN INSTITUTE,
WASHINGTON, D. C., January 26, 1880.

Senator Slater, U. S. Senate Chamber, Washington, D. C.—DEAR SIR: The coal from Oregon, which you submitted for examination, has been analyzed by our mineralogist. He has made a quantitative examination upon his own responsibility, which is, as you know, not furnished by the Institute. He reports as follows: Water given off at 212 degrees Fahrenheit, 2.56%; volatile and combustible, 47.29%; fixed carbon (coke), 48.49%; ash (reddish brown), 2.74%.

Very truly yours,
SPENCER BAIRD, Sec.

Referring to the above, we give the following comparative list of other coals, showing the superior quality of Astoria coals:

Comparative Analysis.

	Astoria coals.	Coos Bay.	Nanaimo.	Bellingham Bay.
Water.....	2.56	20.00	2.98	3.39
Volatile combustibles..	46.29	32.59	32.16	33.26
Fixed carbon coke....	48.49	41.98	46.31	45.69
Ash.....	2.74	5.34	18.55	12.66

This is a very important matter, and establishes the fact that in future references to the Astoria coals we are justified in referring to them by their right name, "coals of the very best quality." This ought to be sufficient to stimulate Astorians to the work of speedily beginning the construction of our railroad, at least to the coal fields.

CEMENTS FOR IRON WORKS.—It is sometimes advisable to fix two pieces of iron, as pipes for water or steam, firmly together, as a permanency. A rust cement is frequently used, and the materials are sal ammoniac, sulphur and iron borings. If the cement is desired to act quickly, the proportions should be: Sal ammoniac, 1 part by weight; sulphur, 2 parts; iron borings, 80 parts. If plenty of time can be allowed for setting, make the proportions: Sal ammoniac, 2 parts; sulphur, 1 part; iron borings, 200 parts. The sal ammoniac and sulphur should be pulverized, and the borings of iron tolerably fine and free from oil. The mixture should be made with water to a conveniently handled paste. The theory of its action is simply union by oxidation.

THE amount of silver coin in Holland is estimated at 144,000,000 florins, or about $60,000,000, of which there were recently about 75,000,000 florins in the Netherlands Bank. The gold circulation, inclusive of the bank's reserve, is estimated at 50,000,000 florins, or about $21,000,000.

THE *Japan Herald* reports that the coinage of silver at the mint at Osaka is going on, such is the demand, at the daily rate of 30,000 pieces, and 1,000,000 monthly, with a demand greater than the mint with its present capacity can supply.

ENGLAND, during the five years just ended, imported silver to the value of $331,553,000, and exported it to the value of $349,671,000—being an excess of $18,118,000 of exports of silver over imports.

THE first gold mine in the United States was discovered in South Carolina in 1790.

USEFUL INFORMATION.

The Origin of Bog Iron Ore.

The roots of trees appear to have power to reduce the peroxide of iron, contained in sands with which they come in contact, to the soluble protoxide. When the water which dissolves this runs into low places, where branches, twigs and leaves of trees are slowly decaying, the protoxide becomes reoxized and is deposited in the interstices of the vegetable forms left by the decomposition of the woody fiber. Thus, parts of the trees are not petrified, but ferrified; the whole beds of iron ore consist of these roots of dead vegetation. Where the ferruginous waters do not encounter masses of decomposing wood, but merely lie at rest, as in swamps and ponds, the evaporation causes the ore to be deposited in lumps, from the size of a shot to 500 pounds weight. From the bottom of ponds these lumps can be raised with tongs, like oysters. In either form the large amount of vegetable matter which this ore contains makes the melted iron reduced from it exceedingly fluid, so that it runs into every nook and cranny of the casting mold, and reproduces it with sharp and precise outlines. When bog ores can be procured to mix with other iron ores, they produce a highly beneficial effect in the running of the furnace and quality of metal turned out; though, as a rule, they will not yield 40% of metal. The pig metal obtained from them is so brittle that it breaks to pieces on being dropped on hard ground. Its weakness is in part due to its containing phosphorus, arsenic, etc. When taken from swamps, the workmen often throw into the cavities loose earth, leaves, bushes, etc., which, often within eight years, leave behind them fresh deposits of ore. The most noted places of supply for bog ore in this country are: Monmouth county, New Jersey. Piscataquis county, Main and Snowhill, on the eastern shore of Maryland. In the early part of the century much was obtained from the ponds of Plymouth county, Mass., and from Egg Harbor, New Jersey.

A NEW varnish for protecting metallic surfaces, especially that of iron, is believed to have been found in the application of euphorbium gum. The history of this suggestion is stated to be as follows: The workmen of Natal are said to have noticed that when they cut certain plants of the *euphorbeaceæ*, a thin, adherent layer of gum remained upon them which effectually protected the blade from rusting. To determine the extent to which this protective influence could be relied upon, the experiment was tried of coating sheet iron with the gum and immersing it in the sea water of South Africa, which is highly detrimental in its action upon iron. The trial is affirmed to have proved so successful that a varnish was made of the gum dissolved in spirits, and this was applied to ships' bottoms and to other metallic surfaces. The adherence of the gum after the evaporation of the spirits is said to be perfect. A ten-years' trial of this preparation at the Chatham dockyard, in England, is reported to have given equally satisfactory results, the iron so varnished having remained uninjured after exposure, during that period, to the corrosive action of the water of the docks. In Africa, where the gum is abundant, it is said to have long been in use as a preventive of the ravages of the white ants. Its virtues are ascribed to its perfect insolubility in water, and to its poisonous qualities and extreme bitterness, which make it an excellent protective agent against the lower forms of marine and terrestrial life.

THE COMING WAR SHIP.—Prof. Læwenthal, a German, thinks that the coming war ship will be made of India rubber. His idea is to make the entire hull of rubber one foot in thickness, strengthened below the water line by a light steel frame. The vessel will be driven by an ordinary steam engine, and will have no masts. At the bow will be a projecting spar, to which torpedoes will be affixed, and the entire crew, including the helmsman, will be on the lower deck out of the range of shot. When a cannon ball strikes the India-rubber ship, it will pass directly through it above the heads of the crew, and the hole made by it will instantly close. Paying no attention to such futile attacks, the India-rubber vessel will steam toward her adversary and explode her torpedo. The doomed vessel will instantly sink, while her elastic destroyer will be driven hundreds of yards backward by the recoil following the explosion. Such a vessel, says the inventor, could destroy all the navies of the world, and after her work was done she could be made as strong as ever with the aid of two or three bottles of cement.

THE LARGEST OF LAND ANIMALS.—In the *American Journal of Science and Arts*, Prof. Marsh describes the largest land animal yet known to have existed on the globe. Its name is *Atlantosaurus immanis*. The thigh bone of this creature is over 8 feet long, with a thickness at the larger end of 25 inches, though the bone has no true head. A comparison of this bone with the femur of a crocodile would indicate that the fossil saurian, if of similar proportions, had a total length of 115 feet. That the reptile was 100 feet long when alive is at least probable. The other bones of this animal that have been found are proportionately gigantic; caudal vertebra has a transverse diameter of more than 16 inches. All the bones of this reptile yet discovered are in the Yale College museum. They are from the Upper Jurassic of Colorado.

A SIMPLE FORM OF AUDIPHONE.—A gentleman formerly connected with the Philadelphia *Ledger* is reported to have discovered a simple form of audiphone, which he has tried with satisfactory results, although he is very hard of hearing. A few days ago he was explaining the principle of the audiphone to some friends, and to illustrate his remarks, put a folded newspaper between his teeth, bending it over in the form of the audiphone. To his surprise he found that he could hear as well with the newspaper as with the audiphone. He subsequently attended an auction sale, and putting the catalogue between his teeth, and bending it down with one hand, heard all that was said, although without some such contrivance he could hear nothing. The experiment is a very simple one, well worth trying by all who are hard of hearing. Newspapers, pamphlets, card boards, oven sheets of writing paper seem to serve the purpose as well as the hard rubber audiphone.

TEMPERING THE POINTS OF TOOLS.—After being tempered the volume of the tool is slightly increased, and consequently its specific gravity is decreased. As the expansion or increase of volume is so very slight, it is quite immaterial which is plunged into the liquid first; however, every moment the edge is kept out it is cooling, and the tempering may be rendered defective thereby. Mercury tempers the hardest, then water, then salt and water, then oil of various kinds—as whale oil. As oil cools the metal more slowly, it is not tempered so hard, but the tenacity is increased.

WOOD CARVING is an industry which is carried to considerable perfection among the Germans, and it is fostered by the establishment of carving schools, particularly in districts where the wood used for the work—the Spanish walnut, the finest and best walnut the Germans have—is plentiful. Eighty of these carving schools exist at the present time in Germany, and 80 in Wurtemburg; but so much importance is attached to the results, which have flowed or are expected to flow, from these institutions, that the number of the carving schools in Germany is to be increased to 200.

COLLECTION OF ORNAMENTS.—A New York firm, Palm & Fechter, have a collection of over 1,000 designs—crests, coats-of-arms, vignettes, scrolls, corner pieces, borders, etc.—suitable for painters, decorators, engravers, lithographers, metal workers, wood carvers, and others having use for such ornaments.

GOOD HEALTH.

Bare Brick Walls—Their Influence on Health.

The New York *Times* of January 14th has the following: "At the meeting of the Board of Health yesterday, a report was received from Dr. E. H. Janes, Assistant Sanitary Superintendent, in relation to an inspection of the recent additions to the new court-house. Dr. Janes says: 'I found that the interior walls consist of brick uncovered by plastor or paint, and thereby present an absorbing and evaporating surface, which, in my opinion, is detrimental to the health of those who daily occupy these apartments. From its porous quality, brick readily absorbs not only air and moisture from the ground and atmosphere, but animal vapors and impurities constantly escaping from the lungs and skin of those confined between brick walls are also absorbed and exhaled in turn with the regular changes and purifications of the in-door atmosphere.

"'I am aware that the experiments of Pettenkofer are cited as an argument in favor of bare brick walls, on the ground that air readily passes through them. But persons holding these views forget that animal impurities do not possess the diffusible power of gaseous bodies, but, on the other hand, adhere to porous structures; and while it may be claimed that foul air will, to some extent, escape through the brick walls from an unventilated apartment, the fact remains that air in finding its way through the wall leaves most of its foulness behind. Bricks so exposed become in time exceedingly filthy, and cannot be thoroughly cleaned by any amount of scrubbing. I would therefore recommend that the interior walls of these rooms be covered with some material that will prevent the absorption and subsequent exhalation of moisture and atmospheric impurities.' The report of Dr. Janes was transmitted to the Surrogate, whose clerks occupy the rooms referred to in the document."

Neglect of the Eye.

Whatever an ounce of prevention may be to other members of the body, it certainly is worth many pounds of cure to the eye. Like a chronometer watch this delicate organ will stand any amount of use, not to say abuse; but when once thrown off its balance, it very rarely can be brought back to its original perfection of action, or, if it is, it becomes ever after liable to a return of disability of function or the seat of actual disease. One would have supposed from this fact, and from the fact that modern civilization has imposed upon the eye an ever-increasing amount of strain, both as to the actual quantity of work done and the constantly increasing brilliancy and duration of the illumination under which it is performed, that the greatest pains would have been exercised in maintaining the organ in a condition of health, and the greatest care and solicitude used in its treatment when diseased. And yet it is safe to say that there is no organ in the body the welfare of which is so persistently neglected as the eye.

I have known fond and doting mothers take their children of four and five years of age to have their first teeth filled, instead of having them extracted, so that the jaw might not suffer in its due development and become in later years contracted, while the eye, the most intellectual, the most apprehensive, and the most discriminating of all organs, receives not even a passing thought, much less an examination. It never seems to occur to the parents that the principal agent in a child's education is the eye; that though it gains not only in sense of the methods and ways of existence of others, but even the means for the maintenance of its own; nor does it occur to the parents for an instant that many of the mental as well as bodily attributes of a growing child are fashioned, even if they are not created, by the condition of the eye alone.

A child is put to school without the slightest inquiry on the part of the parent, and much less on the part of the teacher, whether it has the normal amount of sight; whether it sees objects sharply and well-defined, or indistinctly and distorted; whether it be near-sighted or far-sighted; whether it sees with one or two eyes; or, finally, if it does see clearly and distinctly, whether it is not using a quantity of nervous force sufficient after a time not only to exhaust the energy of the visual organ, but of the nervous system at large.—*Dr. Edward G. Loring.*

INVERSION OF THE BODY IN CHLOROFORM ASPHYXIA.—Dr. Sporer describes an interesting case of this treatment in a recent St. Petersburg journal. A leading English medical weekly refers to it as a "novel treatment," but the value of inversion of the body in such cases was demonstrated long ago, though many physicians may not be aware of the fact. The case in question was that of a boy 11 years of age, in whose ear a pea bad become embedded. After numerous trials to remove it, from 30 to 35 drops of chloroform were inhaled from a handkerchief in order to relieve the great pain which these trials caused, and the body was then easily removed. But scarcely had the inhalation ceased when the boy's pulse entirely failed, and he gave every sign of approaching death. Efforts of restoration of the usual kind were tried in vain for more than 20 minutes. His head and the upper part of the body were then thrust out of the window to try the effect of the cool September air; but as no effect was produced, one of the assistants seized hold of the boy by the legs and hung him out of the window with his head downwards, swinging him to and fro like a pendulum. After four or five minutes of this procedure the boy's death-like face became reddened, and to the joy of all present he uttered a cry. The respiration and circulation were restored after more than half an hour's arrest. Dr. Sporer does not believe the recovery was due to the mere exposure to the air, but rather to the inverted position of the body inducing a passive congestion of the anæmic brain, and thus giving an impulse to the action of the heart.

DEATH FROM AN ELECTRIC SHOCK.—An accident of an extraordinary nature occurred on Tuesday night, Jan. 17, 1879, at the Holte theater, Aston, a suburb of Birmingham. The stage is lighted by two electric lights, and when the candles are not burning the connections used for the purpose of crossing the current are hung up over the orchestra. After the performance of the pantomine, Mr. Bruno, the euphonium player, was leaving with the other members of the band, when, presumably out of curiosity, he caught hold of the two brass connections referred to; the man in charge called out to him with the object of warning him of the danger he was incurring. The warning, however, came too late; Mr. Bruno received the full shock of the electric current, generated by a powerful battery which supplies the whole of the lamps in the building and grounds. It is said that the candles not being then burning, Mr. Bruno was unable to disengage himself, and pulled the wire down. The shock rendered him insensible. A medical man was at once sent for, and restoratives were applied, but Mr. Bruno died in about 40 minutes afterwards.—*The Electrician.*

CALOMEL IN TOMATOES.—An old subscriber and friend writes us that a celebrated French chemist and physician, who has analyzed tomatoes declares that they contain all the elements of calomel, and he has known them to salivate persons. She wishes our opinion on this subject, and we have only to say that this idea has been going the rounds of the press for more than 30 years. It is a falsehood from beginning to end. The idea that they produce salivation may possibly have originated from the fact that, eaten in large quantities by some persons, the acid of the fruit seems to irritate those parts of the mouth with which it comes in contact. The idea that tomatoes cause cancer, is another superstition, the outgrowth of the former notion that tomatoes were unfit to eat. They cause neither cancer nor salivation, and may be eaten with impunity by most persons, and often with great benefit.—*Herald of Health.*

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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The Week.

The widely extended rains of the past few daye bave brougbt comfort to tbc agriculturists of tbe State and expcotations to all of good crops for the coming year. Tbe late rains in tbe valleye and late snows in the mountains are welcome alikc to farmer and miner.

No news of a etartling nature concerning mining operations has been given us for some time. Still, developments quietly go on, tbe results of which are of the future more tban the present. Mining stocks are still dull and inactive, the only news of note being tbe transfer of Mr. Flood's miuing interests in tbe Comstock to Mr. Mackay. A year or two ago such a transaction would bave bad a great and visible effect on the market, but now it is hardly heeded. The brokers continue to leave for New York to seek new fields for their labors. The Chinese have also gone Eastward of late, and already the dispatches tell us of their appearance in New York, and of the efforts to prevent their estahlishing a "Cbina Town" in that city.

The daily processions of tbe unemployed in tbie city have stopped, and measures are being taken by wealthy citizens to provide work for all those wbo really want it. Times are still dull, however, and there is very little building going on. It is boped that business will begin to improve before long, hut it is hardly prohable it will until after the adjournment of the Legislature. So many ahsurd and frivolous bills have been, and are being introduced, that capital does not know where it stands; and this state of uncertainty bas of course a tendency to binder the commencement of new entsrprises or tbe greater development of old ones.

Tbe legislative action of the past week ie fully referred to in another column.

HARTMANN, arrested in Paris for tbe attempt nn tbe Czar'e life at Moscow, has confessed that he was engaged in tbe affair.

THE Lone We Tong Eng Ti Association (United Brotherhood of Masons) has heen incorporated in New York.

A State Mineralogist.

In the last numher of the PRESS we gave tbe full text of Mr. Wasson's hill providing for the sstablishment of a Miniug Bureau at San Francisco. This hill has heen favorahly reported on hy the Assembly Committee on Mines and Mining. While complimenting Mr. Wasson on his dsvotion to the mining industry, we are afraid his hill as it stands at present is trying to do too much.

In the first place the clause making it the duty of the State Mineralogist to make such analytical assays as are required, of the specimens collected, would not operate well. He could not make assays for private individuals, of course, since that would hring him into conpetition with people already making a living out of that husiness; and making assays of specimens sent would amount to this.

It is very douhtful if any good will result from the State forming a collection of minerals in San Francisco and another one in Berkeley. The ostensihle objects of each would he identical, and hoth would have to appeal with exactly the same arguments to exactly the same public. The University collection now increases more slowly than is pleasant. It is, of course, important, in this new country, to keep our scientific interests as "unified" as possihle, since it is only in that way that any desirable result can he accomplished.

The Geological Society are doing good work now in collecting specimens, and these they will at some future time turn over to the State. No douht they will do it now if the State Mineralogist is appointed. But this collection is to he kept in San Francisco. There are many who consider that the collection at Berkeley is of little use since it is out of the metropolis, and at a place where it cannot he conveniently examined. Thie is true enough in some part, but people interested sufficiently to examine specimens sbould not mind the trip to the University. A collection in the city would he a very good thing if it did not interfere with that in which such good progress has heen made already at Berkeley.

As we understand the Wasson hill, however, it is not only a mineral collection he is after. A collection of minerals is not all we want. In fact nine working miners out of ten wouldn't kuow much ahout it when they saw it; and half of them would never even go to see it. It seems as if the main idea of most people when they start in to instruct a mining community is to make a collection of minerals. It is all very well in its way aud serves its purpose, hut it does not serve the purpose most needed. It is more useful at a University than anywhere else, since the specimens are used in instruction and for purposes of comparison.

The third paragraph of Mr. Wasson's hill aims more directly at what we conceive is needed. The mining community want an official, paid by the State, whose duty it is to give them information on certain subjects; information which will bs of *practical value* in their daily work. Wben a man finds a certain deposit, and on inquiry be is told that it is a cartain substance, be wants to know something ahout tbe substance; bow it is worked; what it is wortb; bow it is to be treated, etc. The fact that its true and correct mineralogical name is told him is of no practical value to him. He don't care quite as mucb whether it is named rightly or not, as be does to know wbether it is wortb anything.

Mr. Wasson'e bill provides for the maintenance of a library of mining and metallurgical hooks of reference. *That* the Free Library will do for us. A collection of models of mining and metallurgical appliances also provided for, would he a good thing.

What the miners want is some one who will answer their questions, whicb tbey have no opportunity of solving or bunting up themselves. A miner, for instance, sends down a piece of "rock" to know what it is. Writing back to him and telling bim the mineralogical term for the substance he sent, is by no means all he wants. If it is of economic value, be wants to know it. Wants to know if it is wortb anything, and bow mucb; how to go to work to prepare it for market, etc. Perhaps a dozen men in one part of State are at work on tbe same substance, but he does not know it. He would like a small circular sent to him telling him all ahout tbe euhstance, in terms which will he of use to bim.

The writer bas had, in editorial experience in this papsr for eome nine years, ahundant opportunity to know tbe kind of information the miners want. Dozens of letters are anewered every week of the character referred to. There are not so many different substances obtained from mines in this State that a small circular concerning sncb of tbem as are of economic value which could not readily he compiled and sent in answer to eucb queries. This idea could be broadened to any desirable extent, so as to give information about metallurgical processes, etc. Information of a similar character is availahle to agriculturists; wby not to miners? It need not interfere witb the business of mining engineers or assayers. All that can he properly arranged.

It may seem to some tbat this idea is Utopian, hnt to ue it does not appear so. Information is wanted wbich will eventually result in public good, and tbere sbould be a source from wbicb it may be drawn. If the matter ie put in the hands of some compstent person at the University, or some one in this city, it would he carried out with satisfaction.

A State Mineralogist, in the ordinary acceptation of the tarm, collects and identifies minerals. We do not want a man simply to do that. It was tried in Nevada, hut the trial was a failure and accomplished no hensficial result. If the University can provide for the wants of the miners in ths manuer spscified, hy all means let it do so, and do not multiply offices to the injury of all. Mr. A. W. Jackson, Minsralogist of ths University, will no douht bear witness that he has many questions liks thosc referred to brought to him eacb week, and will acknowlsdge the wants the minsrs have in that direction. He is working hard to make ths collection of minerals complets there, as we well know. Still we consider that Mr. Wasson's hill, in its third section, provides for some things whicb the University, witb its present facilities, does not offer to the mining puhlic.

Academy of Sciences.

Tbe regular monthly meeting of the California Academy of Sciences was held on Monday evening last.

B. B. Redding, California Fish Commissioner, donated a land-locked real ealmon, caught in Winnemucca lake, the result of eggs placed in the Truckee river four years ago, whicb was done hy the expenditure of $1,000, given hy Governor Stanford and Charles Crocker for that purpose.

Donations to the library included "Annale of Harvard Astronomical Ohservatory" from Dr. Pickering, "Rhizopods of North America" from Joseph Leidy, and volume one of a new German geograpbical magazine.

Prof. Jordan of the United States Fisb Commission, who is on this coast in the interest of the Government, was invited to address the Association. He said that the lahors of himself and associates havo, as yet, heen principally confined to the waters af San Diego, San Pedro and Santa Barhara. Among the specimene of fish examined were the European shark, of which little has heen heard on this coast, hut it is taken hy thousands in Los Augeles waters for the oil. Mr. Jordan here exhibited a specimen of the true sole, the only one yet found on the Pacific coast. Tho fish sold in our markets as soles are different kinde of flounders. The one shown was picked up in the Chinatown of Los Angeles. Of the flounders, two new species have heen found. One was caught just outside the Golden Gate, and is evidently the young of a species that grows to a large size. The only other specimens of the species known were found in Greenland. Another flounder was of the halihut form. Otber new forms were found of the sting ray. It was found off San Diego, and is of the Europeau genus. Another ray, caught off Santa Barhara, helongs to the Chinese genus. This is only another evidence that fishes of tbe same genera are common to both sides of the Pacific, and as the speaker facetiously remarked, "forming another link hetween California and China." It ie almost as easy, said Mr. Jordau, to find new genera as new speciee on this coast. Several sharks, about three feet long, were found off Santa Barbara, which bave the peculiar faculty of inflating themselves with air when caught, until they are two-thirds as hroad as they are long. This has only heen known hefore hy specimens brought fiom Van Dieman's Land. To the 11 epecies of rock cod, seven more have heen added. Most of the new spécics are of a bright red color. Another new species of surf-fish or percb was found in the San Francisco market.

In conclusion, Mr. Jordan said he and his party would remain in San Francisco ahout two months, then take np a situation at Monterey and Santa Cruz, tben at Tomales bay, tben Puget eound, and tben go to the moutb of the Columbia.

Professor Stillman read a very ahle and interesting paper, carefully prepared, on the gum and coloring matter fouud on the *Acacia Creggi* and the *Larrea Mexicana*, or creosote plant. The gum which exudes from and surrounds its branches is very ahundant, and is the product known to commerce as shellac, of which sealing wax and varnish is made, also lac-dye, a brilliant scarlet dye so popular in England, and used for dyeing hright red military coats. He expressed a belief that if California can compete with British India in the production of this one article, it will give employment to all our idle hands. It is a most valuable commercial product. B. B. Redding said it extended in unlimited supply, as plenty as sage-hrush, from southern Utah to New Mexico, and from the Colorado desert to western Texas. It is most abundant around stations on the Mojave and Colorado deserts, and exudes as the result of an insect'e sting. Calcutta exports a million pounds sterling in value annually of sbellac, selling at 25@35 cents a pound, and almost as much more of lac-dye, selling at 30@40 cents a pound. In 1876, the United States imported 700,000 pounds of shellac alone. To collect this, is simple work for hoys, and will prove an important industry. It will require little or no capital. The twigs are hoiled in hot water and the gum rises to tbe top, is skimmed off, strained and dried on smooth etones, and hand-pressed into flakes, ready to make ssaling wax or varnish. The residus, when allowed to settle, makes lac-dye. The plants live on s rainfall of three inches a year. It is found in all parts of Arizona, and well dsmands the attention of commercial men.

The Ferguson Mine, Mariposa County.

We referrsd soms months ago to the way in which this mine was heing opeued out and worked, as an exampls of trus economy in mining, and indicatsd our conviction that the owners would at an early day hegin to reap ths results of their patient lahors. Thsse anticipations have already hsgun to he fulfilled; the first dividend was declared last month, and from the extensive reserves now opened up in the mine, continuous dividende for some time to come appear to he assured.

The two principal hodiee of ore, over 400 feet long, which, in the main level, are divided hy 200 feet of harren ground, in the bottom level, 200 feet helow the main level, have only 60 feet of unprofitable ground hetween them. This 200-foot level is now over 600 feet in length, the whole distance, with the exception of thie epaco of 60 feet, on the vein, which still etands iu hoth the north and the south end of it, showing that the limits of the ore hody at thie depth are not yet reached. From the way in which these ore hodiee have lengthened as they have heen followed in depth, there ie every prohahility that the 300-foot level will develop an unhroken chute of pay ore from 800 to 1,000 feet in length; and as the ore for eome months past has yielded in the mill from $20 to $28 per ton, the value of the property will he readily apparent.

The mine is in a position of such assured success that the owners have determiued no longer to postpone the erection of hoisting machinery of ample power for all the requirements for years to come, the present more simple appliances having done the work for which they were deeigned. Two horizontal engines, hoisting works and pumps will he erected over the Ferguson ehaft, which is eunk helow the main level, at a point 1,000 feet in the mountain from the mouth of the level. Two air-compressors, each having two compressing cylinders, will supply the air as motive power for the engines and for rock drills, and will at the eame time furnish air for ventilating the more remote portione of the miue, which at present cannot be advantageously worked. These engines and air-compressore have heen huilt in this city hy Messrs. Reynolds & Rix, of Fremont street, from special design, and have heen much admired hy many practical mcn interested in every fresh improvement in our mining machinery. A turhine wbeel under a pressure of 30 feet, will give the power to run the air-compressors, the wator heing drawn from the Merced river, which forms the southern boundary of the mine, and furnishes an inexbaustihle stream in the driest seasons.

The Ferguson now takes its place among our dividend-paying mines, and all the features of the mine from which forecasts of its future may be made, point to its maintaining this satisfactory position for some time to come.

Recent Decisions Relating to Patents, etc.

We give helow brief ahstracts of decisions* rendered upon patent cases in litigation for the benefit of our readers.

Perry vs. Littlefield et al.

U. S. Circuit Court, Nortbern District of New York. Decided Nov. 10th, 1879. Blatchford, J.:

1. Re-issue, No. 4,000, May 31st, 1870, of Patent No. 53,251, Marcb 13th, 1866, and Re-issue, No. 1,823, Nov. 22d, 1864, of Patent No. 10,448, of Jan. 24th, 1854, to D. G. Littlefield, are for improvements upon Patent No. 8,047, of April 15th, 1851, to said Littlefield, and are included in an aseignment conveying an exclusive license under said patent of 1851, and improvements thereon.

2. When the parties to tbe suit are citizene of the same State, a hill to compel the execution of further tranefers under an agreement is not maintainahle in the United States Circuit Court.

Holbrook et al. vs. Small. Same vs. Matthews et al.

U. S. Circuit Court, District of Massacbusetts. Decided Oct. 9th, 1878. Lowell, J.:

1. Expenses of suit are never allowed in assessing damages; nor is interest to be computed upon the amount of profits, except under peculiar circumstances.

2. The powcr given the court by statute to treble the *damages* does not extend to *profits* in a suit in equity.

3. Costs having been taxed equitahly, and in tbe manner to whicb both partiee had consented, neither can he allowed to witbdraw consent upou coming in of the Master's report.

Master's report and clerk's taxation in eacb case affirmed.

* More completo reports of the proceedings may he found on file in the office of the MINING AND SCIENTIFIC PRESS Patent Agency, 202 Sansome street.

SIR JAMES FERGUSON bas heon appointed Governor of Bombay.

The Hofmann Process.

An article written by Wm. G. Kustel some little time since, describing the Hofmann process for the treatment of ores, attracted the attention of several gentlemen interested in metallurgical operations, who gave their opinions of the process in our columns. The controversy hinged more upon the patentability than the practicability of the process, as those who have followed the discussion know. In the last few numbers, however, the writers have dealt more in personalities than in matters of general interest to miners or metallurgists. While we are very glad to have these gentlemen discuss, as freely as they like, all matters connected with mining or metallurgy, personalities are not pleasant. The two letters given below, in answer to those of former correspondents, are inserted in a spirit of fairness to all, and as the conclusion of a discussion which, continued in its present form, would prove unprofitable to all parties.

Mr. Irelan's Statement.

EDITORS PRESS:—I have been a silent observer of the controversy relating to the "Hofmann process"—little thinking that any remarks in the premises would be demanded from me; but under the circumstances—a malicious accusation falsely made—silence would be an admittance of that which is not true.

Being as I suppose the person referred to by Mr. Ottaker Hofmann in your last issue as having been "found at the vats," I will give a correct statement of facts—and not Hofmannize.

In May last in company with a San Francisco "capitalist" I visited the Colorado mine, No. 2, situate in Monitor, Alpine county, California. I was assigned the duty of examining the concentrations, to see if they were properly worked, and other little chores.

On our arrival Judge Griffith, part owner of the property, said I should have an opportunity on the following day of examining into the object of any visit. After waiting patiently until the third day, I remarked that it seemed I was not to have the opportunity promised. On further conversation with Judge Griffith we inferred that Mr. Hofmann was jealous of the work allotted to me. The "capitalist" thereupon informed the Judge I was there in his employ and not to interfere with Mr. Hofmann; in fact I would not accept the position filled by that gentleman, as the salary he was getting would not pay me.

Whether Mr. Hofmann was informed of this last interview I do not know, and care less. We did not think it prudent to take Mr. Hofmann into our confidence. At any rate we were invited to visit the works. On our arrival at the assay office, which faced on the road, a short distance above the mill, I was requested by the capitalist to go into the works, and if Mr. Hofmann raised any objections, to retire. Never having seen the works before, it was natural that I should go in at the first entrance presenting. It so happened this was the all-important "back door" that Mr. Hofmann lays so much stress upon. It is not true that Mr. Hofmann "found me in front of the tanks," but upon entering the mill I went toward the place where I saw the workmen. On reaching the vats I saw Mr. Hofmann, and used the following words in explanation of my being there: I am not here with the object of finding out any secrets—neither do I wish your position. If you have any objections, please say so. He answered, that in connection with the process was an invention of his own which he wished to keep a secret for the present. I then told him I would return to the assay office.

Mr. Hofmann fathers a malicious falsehood when he states he refused to grant my request to visit the works. I never asked his permission to visit them. I was not there to ask or to receive favors from Mr. Hofmann. I was there with the party who was negotiating for the purchase of the property.

I cannot describe an article in place in the works at that time, neither had I the least idea of the Hofmann process, or ask any information thereon from any one, Mr. Hofmann's assertion to the contrary notwithstanding.

After arriving at the hotel, a gentleman asked me about my visit, and I gave him an evasive answer. This gentleman, several others being present, spoke about Mr. Hofmann's method of working; and although I am not the father of a "process," I was satisfied a success, according to the description, was an impossibility. I related to Mr. Hofmann, the same evening, as near as possible, the exact language this gentleman used.

I behaved gentlemanly and honorably toward Mr. Hofmann; and I think his unwarranted, unprovoked, unproven assertions in reference to me should be met with "*Honi soit que mal y pense*," or, in good old-fashioned English, "Young man, your chickens have come home to roost."

Mr. Aaron will bear me witness that, on my return to San Francisco, I told him Mr. Hofmann had informed me that he had a secret in his method of working, and I made no inquiries, and received no information, therefore could not impart any; neither did Mr. Aaron ask it.

I object decidedly to personalities, but if one should say you did, you certainly, in speaking the truth, cannot help saying you didn't. I never play at the game of throwing mud, as it is only those with soiled hands who are the winners—therefore I don't play a losing game.

The "traveling assayer" did carry new crucibles; the object is obvious. Mr. Hofmann accepted those same new crucibles as a gift from the "traveling assayer." The "traveling assayer" left of his own volition, and had pressing invitations from the powers that be to come back soon. Can Mr. Hofmann truthfully make the same statement?

I advised the "capitalist" if he purchased the property to retain Mr. Hoffmann as metallurgist, as he could do no better. Did I a make a mistake?

Mr. Hofmann after giving utterance to his unwarranted accusations, wishes to "forever drop the subject." It is another cry of "Save me, Cassius, or I sink."

WM. IRELAN, JR.

Metallurgist's Answer.

The letter of Mr. Hofmann, in your issue of February 28th, is difficult to answer, because I don't want to be so rude as to say it's all *nonsense*, and so dispose of it in one word, nor do I wish to write a book about it. Perhaps a few facts may help Mr. Hofmann to a better understanding of my position, and to a better temper. I shall speak for myself alone, leaving Mr. Dustken to speak for himself, though I think a part of what I say will be true also as to him.

I did not attack the *merits* of Hofmann's improvement, but the patent on it.

I do not doubt, nor have I intimated such doubt, the advantages of the method in certain cases, such as that in which it was applied by Mr. Hofmann, for I always supposed that he had tried the ordinary course first.

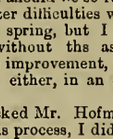
I have never used, or needed to use Hofmann's improvement, neither did I find out anything about it in "a roundabout way."

I never knew anything about the matter, till Judge Arnott applied to my partner for a man to superseds Mr. Hofmann at the Colorado No. 2. I then sent the young man, Beardsley, as I did not wish to go myself. From Mr. Beardsley I received all my information on the subject. If my partner knew last spring what was being done he never told me a word about it. I don't think he ascertained anything except that the company were satisfied with Mr. Hofmann's results. I think Mr. Hofmann's suspicions regarding my partner are as unfounded as his charges against me. Our recommending a young man for the position was a mere matter of business, and should be so regarded.

I did encounter difficulties with the Murchie sulphurets last spring, but I overcame them, measureably, without the assistance of Mr. Hofmann or his improvement, without knowing or thinking of either, in an entirely different way in fact.

When I attacked Mr. Hofmann's *patent*, not the *merits* of his process, I did so without ulterior motive, because I understood it to be a patent on the simple succession of the two processes, in which succession the usual order was reversed, and I thought and still think, that I have a right to do this as a matter of convenience if I think proper. The view of the case presented by Metallurgist had not then occurred to me, and as Mr. Kustel for the defence seemed to take his stand on the very ground which I disputed, that the mere "coupling" of two or more known processes constituted an invention, I continued the discussion with *him* on that basis, and on some incidental points.

FIG. 3.



To answer one of my own questions, as neither of my opponents has done, a question which I am not alone in asking, the reason why the amalgamation of my tailings, after the Plattner-Kiss process, would not be a patentable invention is, that it is not shown that the first part of the treatment is necessary to the success of the amalgamation, but the amalgamation is only supplementary.

If Mr. Hofmann is satisfied with Metallurgist's view, I am content, though, in view of the way in which "Hofmann's process, patented," is presented by Kustel, something might be said on the other side.

I hope with this to have done with a subject which *is* becoming "disagreeable," and I leave your disinterested readers to judge whether Mr. Hofmann's injurious suspicions and insinuations are based on fact, or whether he has looked into his own heart to find motives *sui generis* for others acts. Perhaps it may help him and others to a more just estimate to inform him that the Mr. Aaron of whom he entertains so mean an opinion is identical with the correspondent who indicated the only tenable argument in favor of *any* patent on the Hofmann process, who was actuated by a desire to do justice, and who signed himself

METALLURGIST.

Improvement in Microscopic Eye-Pieces.

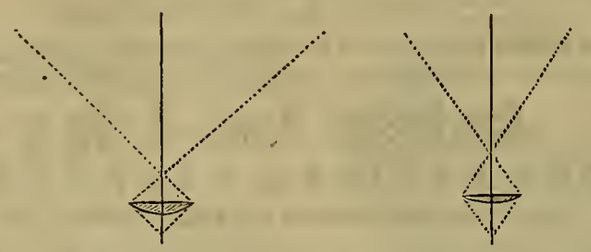
[By J. H. WYTHE, M. D.]

The magnifying power of microscopic objectives depends on the diameter of the cone of rays at the upper part of the tube of the instrument. As in Fig. 1, the cone of rays from an objective of short focal length is much wider at the base than the cone from one whose focal length is larger.

The diameter of such a cone may be increased by using a concave lens, or msuiscus, which produces still greater divergence, as in Fig. 2.

If this diverging lens be made achromatic, no injurious effect can happen to the image formed by the objective, save the loss of light consequent on enlargement. Even a non-achromatic concave lens or meniscus may be usefully employed to amplify the image, so that an objective of low power may be made to magnify an object as much as one of shorter focal length.

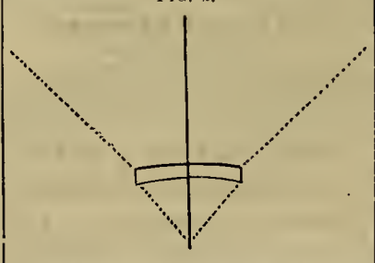
FIG 1.



Theoretically, a perfectly achromatic amplifier is needed, but practically, one not achromatic is quite useful. The degree of amplification depends on the concavity of the amplifier, its nearness to the objective, the length of the tube, and the power of the eye-piece used to concentrate and magnify again the image produced.

The diameter of the microscope tube has an important relation to the distinctness and luminosity of the image. Few tubes are wide enough to utilize more than a small proportion of the rays proceeding from an objective. The field glass of the eye-piece should be of the greatest diameter possible for its focal length, and the tube wide enough to receive it, in order to concentrate the greatest number of rays from the objective. The short tubes of French and German microscopes are supplied with narrow eye-pieces, which cut the cone of rays nearer the objective and give a more brilliant image than would be possible in a longer tube. If the tube be longer, it must also be wider, and the eye-piece of corresponding diameter.

FIG. 2.



In considering the construction of the microscope with a view to greater amplification by the eye-piece, it occurred to me that the concave lens or meniscus used to diverge the rays of the objective should form a part of the eye-piece and be of as large diameter as the tube will allow. If it be of small diameter, it must be placed nearer the objective. This is the form and position of the amplifiers of Tolles, Zentmayer and others.

One of the amplifiers, exhibited by me to the San Francisco Microscopical Society on a previous occasion, consists of a conical meniscus (Fig. 3), whose position in the tube and effects correspond with the amplifiers above named. With this simple addition placed in the lower end of the draw tube, the magnifying power of an objective can be nearly doubled with little loss of light or of definition.

The Other Form of Amplifier

Exhibited is still better. A double concave lens, or meniscus, of as great diameter as the tube will allow and of considerable diverging power, is placed at a distance of from two to four inches in front of the eye-piece. In the improved form in which I now present it, a concave meniscus of six inches equivalent focus and one and a half inches diameter (which formerly served as part of the object-glass of a small telescope), is placed in a draw-tube at the end next the eye-piece and about three inches from the latter. To counteract the aberration of the amplifier, I have sometimes substituted for the plano-convex field glass of the Huygenian eye-piece a convex meniscus of short focus, which gives also a very wide and flat field of view. Ordinary eye-pieces and the periscopic eye-pieces of Gundlach may also be used with the amplifier. The amplifying eye-piece, thus constructed, has given me great satisfaction. If the concave meniscus were made achromatic, it would doubtless be a still further improvement, yet the performance of the eye-piece leaves little to be desired. The wavy, basket-like, longitudinal striæ on *Surirella gemma* and the hexagons on *P. angulatum* are well seen with a one-fourth objective, and the *Frustula Saxonica* and *A. pellucida* (dry) have been resolved by it with a non-adjusting one-eighth of Gundlach's.

In Place of the Concave Meniscus

Referred to, I have also used, with nearly as good effects, a double concave lens of two or three inches equivalent focus, such as can be obtained at an optician's for about 50 cents. So that by a very small cost of time and money, the possessor of an ordinary objective may increase the power of his instrument to a very great degree.

I reiterate the conviction before expressed, that further improvement of the microscope may be looked for in the construction of eye-pieces—regulating their magnifying power and increasing their diameter so as to concentrate rays from the objective, which are now absorbed by the sides of the tube.

Legislative Matters.

Mr. Chamberlain's new bill to prevent the flow of mining debris in certain rivers of this State, provides that the State and two consulting engineers are constituted a Board of Engineers, whose duty it shall be, under the direction of the Governor, to proceed immediately to the construction of a series of such dams or other works on the Yuba, Bear, Feather and American rivers, at such points in the mountains or foothills, as to said Board shall seem most effectual, to arrest and stay the flow of debris from hydraulic mines, the cost not to exceed $600,000; no plan not to be adopted unless concurred in by two of said Board and the Governor—the Secretary of State Engineer to be Secretary of the Board. Each month's report shall be made of work done and work contemplated for ensuing months. The right of eminent domain may be exercised under Title 7, Civil Code, for the purpose of condemning land upon which to build dams and other works, and to stow debris; all of which is declared a public use. It also provides for keeping and payment of accounts, and appropriates $600,000. Chinese or Mongolian labor is prohibited.

Mr. Carr, of Yuba, has also introduced a bill to dispose of mining debris, and protect the rivers and lowlands of California from drainage thereby. It provides for a Board of State Drainage and Protection Commissioners, to consist of the State Engineer, Surveyor-General, and the Governor, who shall preside, and a Secretary, at $2,400. The Board shall report on or before the 1st of January, annually. The State Engineer shall, within thirty days after the passage of the act, submit to the Board a report containing the result of his investigation as to drainage and protection, with plans, having in view the object of the act, and state localities where protection is most needed; and then the Board shall proceed to act. Lands may be condemned under the Code, but no levees, embankments, etc., shall be purchased, except on proof of actual damage made. To pay expenses, a tax of one-tenth of one per cent. on all taxable property in the State, in addition to other taxes, shall be levied in 1880.

A bill has been introduced, and referred to the Committee on Mines, adding new title to the Code authorizing the establishment of mining districts by Boards of Supervisors.

Braunhardt has introduced a bill which is supposed to encourage the mining interests and suppress stock gambling. The bill is similar to that introduced in the Legislature of 1878 by Tuttle, with additional sections providing for advertising mining notices of incorporations.

The Assembly Committee on Mines and Mining has agreed to recommend Wasson's bill for the establishment of a Mining Bureau at San Francisco for the collection of mineral specimens.

WE call attention of mining and quartz millmen to the advertisement in another column of W. E. Shepman, proprietor of Pacific Gold, Silver, etc., Plating Works, established in 1868. They furnish silver-plated amalgamating plates for saving gold, and guarantee good work and lowest rates. The works have lately been removed to 41 Geary street, San Francisco.

THE delivery from the Benicia arsenal of $12,000 worth of arms and ammunition to the Governor of California has been ordered by the Secretary of War.

SIX men and several teams were buried in a snowslide Friday last at Logan, Utah, but subsequently four of the men were rescued.

THE war between the Western Union and American Union Telegraph Companies is becoming very warm in the Northwest.

A Glacier in Colorado.

A gentleman who has during the past two years traversed the mountains in the vicinity of Leadville, and penetrated almost evcry one of the secret recesses, informed a *Herald* reporter yesterday that there is within 25 miles of this city one of the most interesting curiosities of nature—a veritable glacier, presenting all the characteristics of the glaciers of Switzerland, both in magnitude and motion, its progress he ing gradually down the gulch. The scene of this curiosity is located in the Mosquito range, about 15 miles north of the pass. Our informant states that he first discovered it about three years ago, when out on a prospecting tour. It was then nearly a mile in length, and at the hottom of the gulch presented a sheer precipice of ice not less than 150 feet in hight. Later in the season the place was visited again, when it was found that the great mass of ice had melted uutil at its face it was not more than 100 feet high, the loss from the surface reducing its length to ahout half a mile. Again, early in the following year, the place was visited, and the glacier was found to have regained its hulk, showing that the accumulation of ice and snow during the winter was ahout one-third its gross hulk.

The rocks on the sides of this immense mass of ice show the marks of attrition, proving he yond all controversy that the glacier is in motion. Indeed, the earth at the foot of the glacier, heaved up in great masses, shows that it is gradually moving down the gulch into the valley. During the summer a large stream of water flows from the face of the ice cliff. Our informant is of the opinion that the glacier, as it progresses out of the deep gorge in which it was formed, will slowly melt away, and that it will not last many years. It is out of the way of ordinary travel, and the route to the scene is exceedingly difficult, so that it is not likely to be visited except by prospectors and hunters.—*Leadville Herald.*

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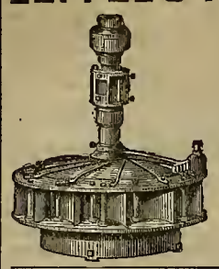

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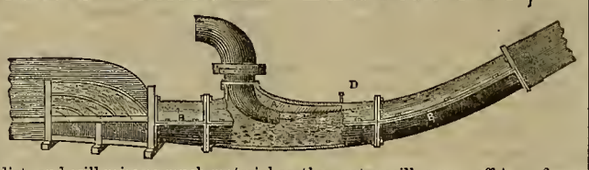

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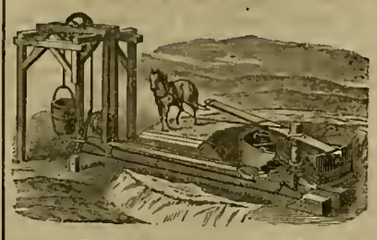

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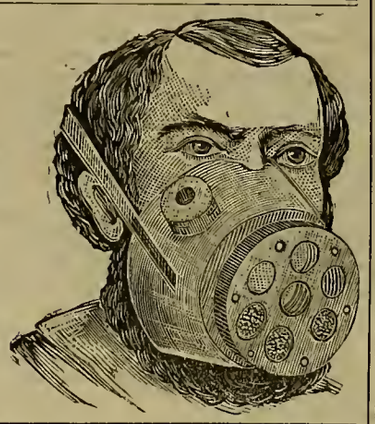

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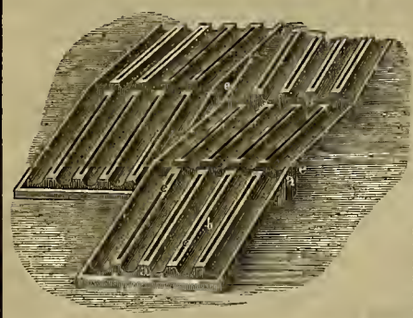

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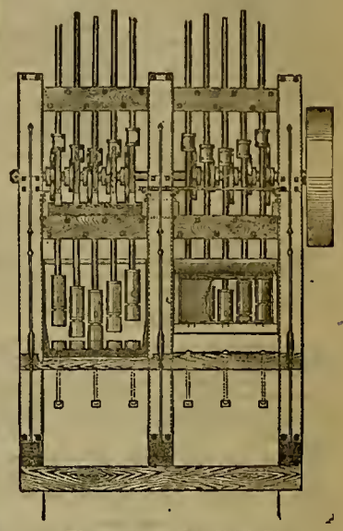

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CONTINUED FROM PAGE 149.

tom. Several mill runs have been made which returned from 55 to 105 ounces in silver per ton. The ore is free milling, and can be treated under stamps at an expense of but a few dollars per ton.

HERCULES & SEVEN-THIRTY.—A fine body of ore was struck in the 80 level running west from the Roe shaft. The vein is about a foot in thickness, composed of galena carrying ruby and gray copper, and is worth $400 or $500 per ton.

PIONEER.—This property has been improving steadily during the past summer as developments has progressed in the lower workings. The mine pays dividends as regularly as a national bank, and if it had a 100-stamp mill instead of a 16, it would be one of the great mines of the country.

O. K.—*Register-Call*, Feb. 27: The level going west from the tbe second station is in 205 ft, a very good ore vein having been passed through in the last 40 ft.

BOSS NO. 2.—This property, situated in Quartz Valley Mining district, sent off last week 738 pounds of first-class ore, for which $437.97 were paid, being at the rate of $905.90 per ton; also 5,332 pounds of second class assaying 399 ounces silver per ton, for which was received $953.60, or a total of $1,296.66.

HASELTINE.—A load of first-class ore brought $1,020.90 over and above treatment. The ore weighed 2,612 pounds, or a price value of $783.70 per ton. The ore came from the 100 west level, in the bottom of which there is a good vein. There is now in sight in this particular portion of the mine $15,000 worth of ore.

IDAHO.

MONTANA.—*World*, Feb. 24: Near Bonanza City, is beyond doubt the richest gold and silver mine on the continent. At the depth of 140 ft the vein is from 12 to 15 ft wide, and the ore worth from $2,000 to $5,000 per ton.

ELK HORN.—Work has been resumed on the Blue ledge, which yielded so much bullion in early days, and about 40 tons of ore taken out. The vein is four and a half ft wide.

UTAH.

PARK ITEMS.—*Mining Review*, Feb. 21: Information reaches us that coal has been discovered near Heber. If the indications as reported are reliable, the owners can find a very good market in Park City. The Ada No. 1 has struck a three-ft vein of ore which assays from $113 to $600 per ton in silver. Over 600 tons of bullion lie on the dump of the Frisco smelter awaiting transportation, and is fast accumulating on the Horn Silver smelter's dumps.

BINGHAM ITEMS.—The Howard has two men at work drifting on the vein, which is about three ft wide between walls. The ore averages about $50 per ton. At the Red Cross a tunnel is being run on the vein and is in about 130 ft.

BARBEE & WALKER.—Silver Reef *Miner:* The main working incline runs to the 300 station at an angle of 45°. The first south level started 125 ft from the mouth of the incline is in 160 ft on the vein; the ore is of high-grade and continues to the surfaces. The second south level in 179 ft and shows fair grade ore; the upraise from this level shows a large amount of pay rock. The bottom of the incline is 40 ft below the 300 level, which runs north 400 ft. A crosscut east from the main vein near the station is run 50 ft and strikes a back ledge of high-grade ore. Another crosscut has been run from the face of the drift 40 ft west and a fine body of ore uncovered. The 200 north level shows a vein of high-grade ore, the richest that the mine ever produced.

Meetings and Elections.

GOLDEN CHARIOT M. CO.—Mar. 2. Trustees: Sam'l Rosener (President), Joseph Clark (Vice-President), John Rosenfield, R. T. Carroll, H. W. Scales, B. Speur, A. Borland. The Secretary is J. T. McGeogbau and Treasurer Augio-Californiа Bank.

PACIFIC ROLLING MILL CO.—Trustees: D. O. Mills, Wm. Alvord, Louis McLane, Nicholas Luning and James O. Fair. The Trustees organized by electing the following officers: President, William Alvord; General Manager, L. B. Benchley; Superintendent, Patrick Noble; Secretary, C. M. Keeney.

MINING TRUST CO.—In connection with the new Mining Exchauge in New York, a Mining Trust Co. has been organized and the following officers elected: President, H. G. Stebbins; Vice-President, Elisha Riggs; Mining Director, Milton S. Latham; Treasurer, C. F. Christiansen; Secretary, Drake DeKay; Board of Trustees—L. Von Hoffman, H. G. Stebbins, Elisha Riggs, R. C. McCormick, L. M. Lawson, H. A. W. Tabor, Drake DeKay, S. B. Elkins, A. P. K. Safford, Henry Havemeyer, W. F. Shafer, R. W. Leavitt, Milton S. Latham, J. B. Chaffee and George D. Roberts. The new board will be known as the American Mining Stock Exchange. The membership will be limited to 800, and will be entitled to a share in the Trust company. The annual dues will be $100. Business will commence when 100 members are enrolled. All the stocks placed on the list will pay $500 fees and a tax of $100 annually. All the managers of mines listed at the exchange are required, as early as possible, to make arrangements for the registry and transfer at the office of the Mining Trust company in New York city. This rule will force mines listed on the board to have offices in New York, and will practically transfer all the business of the mines so listed from the Pacific to the Atlantic coast.

News in Brief.

A SEVERE earthquake occurred at Yeddo on the 25th.

CHIEF DOUGLASS has been placed in the fort at Leavenworth, Ks.

THE entire Russian fleet in the Ural sea has been ordered into the Oxus.

THE President has nominated Pinobback to be Naval Officer at New Orleans.

YELLOW fever prevails on board the U. S. steamer *Marion* at Montevideo.

THE death of the wife of Chief Justice Prince, of New Mexico, is announced.

THE strength of the British force in Burmah is to be maintained another year.

THE work of boring the St. Gothard tunnel was satisfactorily completed Feb. 29th.

THE unemployed workingmen at Ottawa, Ont., are showing signs of discontent.

THE condition of Princess Louise is said to be more serious than at first reported.

JOHN MCGINLEY was stabbed 22 times at Gold Hill, Nev., recently, by A. J. Caldwell.

A COMMISSION of Supreme Control has been appointed at St. Petersburg by the Czar.

VERA SASSULITCH, the famous female Nihilist, has been arrested at St. Petersburg.

THE order prohibiting the importation of neat cattle from Canada has been revoked.

THE coinage at the Mints during February was 3,885,020 pieces, of the value of $5,129,969.

THE Postmaster-General's recent order in regard to the Star mail service has been suspended.

THE King of Belgium is sending six small steamers to Stanley, for use on the Congo river.

THE recent severe weather in Idaho and eastern Oregon caused a loss of 20,000 head of stock.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING FEBRUARY 24, 1880.

234,886.—APPARATUS FOR BURNING HYDRO-CARBONS—H. H. Fames, S. F

224,937.—ENGINEER'S SHOE—W. H Mintzer, Clayton, Cal

224,938.—PAVING TILE—W. J. Mitchell, S. F.

224,939.—RETURN CRATE—R. E. Morey, SanGabriel, Cal.

224,940.—ORE FEEDER—D. J. O'Harra and D. Feit, Reading, Cal.

224,954.—MEDICAL COMPOUND—T. J. Robbins, Middletown, Cal.

224,957.—MINER'S COMBINATION TOOL — W. S. Rosecrans, San Francisco.

224,964.—VALVE-GEAR FOR STEAM PUMPS—W. P. Stephenson, Portland, Ogn.

224,975.—GRAPE PICKER—T. C. Truman, Fresno, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

RETURN CRATE.—Roswell E. Morey, S. F. Patented Feb. 24, 1880. No. 224,939. In sending fruit, vegetables, poultry, game and other articles to market, boxes, crates or coops must be employed, and these, when empty, are either broken up or lost to the shipper, or else they must be returned by the transportation companies at their own expense, which is the usual custom. In order to reduce these empty packages to smaller dimensions, so that the expense of transportation will be lessened, various methods for folding them have been tried, in many of which hinges have been employed. These hinges become broken or torn off, and the expense of manufacturing is also considerable. In this device the crate or box is formed, the sides and ends of bars which are preferably rounded on the inside by suitable means so as not to bruise the contents. The ends of these bars meet at the four angles, and a long bolt passes through the overlapping ends at each of the four corners, extending from top to bottom. The top and bottom may be made of slats, or of boards to form a tight top and bottom, as may be desired. When this crate is empty the top and bottom are removed, and the sides turn about the bolts and fold together.

PAVING TILE.—Wm. J. Mitchell, S. F. Patented Feb. 24, 1880. No. 224,938. This invention relates to certain improvements in tiles and blocks which are employed for paving purposes, and it consists in the formation of a block, so that its upper half will project beyond the lower half upon two adjacent sides, said projecting portions being provided with dovetail depressions and interlocking projections. By this construction the projecting upper half of each block will rest upon the corresponding projections of the lower halves of the two blocks lying next to it upon these two sides, and each block thus supports two others, and is, in turn, supported by two others. It is usually preferable to lay the tiles with cement, so that when it has set the whole bed will be solid.

Economic Geology at the University.

EDITORS PRESS:—Some time ago I sent from the University circulars to the mine owners, Superintendents and Presidents of the Pacific coast, asking their co-operation in the formation at the University of a collection of ores, wall rocks and other useful minerals, that should be a complete representation of the economico-geological resources of the State. My object in founding such a collection was three-fold. First, that there might be at some central accessible locality a collection of ores that might be consulted at any time by any one interested in our metalliferous resources; the existence of such a collection would certainly be of great convenience to the mining community, often saving laborious journeys into the mountains for the examination of material that might be just as easily consulted here. Second, that the requisite material might be at hand for the illustration of my lectures upon Economic Geology, to be delivered to the students of the College of Mines. Third, that the geological relations of the ore deposits of the coast might be systematically studied. Much has been learned, it is true, from the examination of separate, isolated deposits, but they have never yet been studied *as a whole*. They could not be, because such investigations could not be carried out without the aid of an extensive collection of ores and wall rocks, and till now such a comprehensive collection as is contemplated has never been made. Ore deposits are subject to *laws*, but it has been found that very few only of these laws are of such a *general* character that the results of the experience of one country can be safely applied to another. Every mineral region must be studied by itself, and the laws of its formation worked out independently. I conceive this to be a work of the greatest practical value to California, and sincerely hope that it will be appreciated and forwarded by every one in anyway connected with the mining interests of the State.

The matter to which I desire particularly to call the attention of the mining public through the columns of your valuable paper, is the fact that the large majority of those who in response to my circular have sent material to the ore deposit collection have desired assays of the material sent. Now aside from the fact that the State has never authorized this department to enter into competition with private enterprise in the prosecution of commercial assays, is the further utter impracticability of attempting such a thing. As soon as it should become generally known that the State furnished assays free of charge, it would require the constant services of half a dozen assistants to keep abreast of the demands that would flood in upon us.

It must be accepted as a fundamental principle that no department of the University will ever undertake commercial work of any kind, and the success of the museum of economic geology, so far as it depends upon the co-operation of the mining community, must rest entirely upon the appreciation of the great importance of the three objects above indicated.

A. W. JACKSON.

University of Cal., Berkeley.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Chew JACKSON'S BEST Sweet Navy Tobacco

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

A. F. MCGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F MCGREW, Secretary.

Office—Room 7, No. 420 Moutgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. MCGREW, Secretary.

Office—room 7, No. 420 Montgomery St., San Francisco, California.

California and Oregon Land Company.—

Principal place of business, San Francisco, California. Location of works, Lake and other counties, Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 5th day of February, 1880, an assessment of Thirty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary.

Any stock upon which this assessment shall remain unpaid on the 15th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 15th day of April, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, 318 Pine street, room 5, San Francisco, California.

Cataract and Wide West Gravel Mining

Company. Principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 2nd day of February, 1880, an assessment (No. 2) of Twenty-five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 25½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 8th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 29th day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. B. LAKE, Secretary.

Office, room 18, 25½ Kearny Street, San Francisco Cal.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 40) levied on the Twenty-fourth day of December, 1879, the several amounts set opposite the names of the respectivs shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Ashby, Mark T.....	7	5000	$500 00
Ashby, Mark T.....	16	500	50 00
Ashby, Mark T.....	19	1200	120 00
Drew, J P.....	254	500	50 00
Drew, J P.....	255	300	30 00
Drew, J P.....	250	200	20 00
Drew, J P.....	257	500	50 00
Drew, J P.....	258	250	25 00
Dennis, John C.....	249	440	44 00
Dennis, Delia H.....	250	500	50 00
Dennis, Delia H.....	251	250	25 00
Plaisted, F A.....	90	300	30 00
Plaisted, F A.....	91	100	10 00
Plaisted, F A.....	92	100	10 00
Plaisted, Thankful P..	89	500	50 00
Prince, Chas.....	222	100	10 00
Prince, Chas.....	223	100	10 00
Prince, Chas.....	224	50	5 00

Also, 510 shares of the old issue, equal to 2550 shares of the new issue of the capital stock of the said Gover Mining and Milling Company.

Names.	No. of Certificats.	Old No. Shares.	No. New Shares.	Amount
Dennis, E.....	174	10	50	$5 00
Dennis, Ezekiel ..	271	10	50	5 00
Foy, J K.....	396	50	250	25 00
Foy, J K.....	400	50	250	25 00
Foy, J K.....	634	10	50	5 00
Foy, J K.....	635	10	50	5 00
Foy, J K.....	636	10	50	5 00
Foy, J K.....	637	10	50	5 00
Foy, J K.....	656	60	300	30 00
Marr, C H.....	918	40	200	20 00
Skinner, E C.....	441	100	500	50 00
Skinner, E C.....	619	100	500	50 00
Skinner, E C.....	620	50	250	25 00

And in accordance with law and an order of the Board of Directors, made on the Twenty-fourth day of December, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Monday, the First day of March, 1880, at the hour of ons o'clock P. M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

W. O. WILSON, Secretary.

Office, room 8, No. 402 Front street, San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Gover Mining and Milling Company is postponed to Monday, the eighth day of March, 1880, at 12 o'clock M.

W. O. WILSON, Secretary.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) levied on the 14th day of January, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
J R Robbins, Trustee....	13	500	$50 00
J R Robbins, Trustee....	17	68	6 80
J R Robbins, Trustee....	61	1000	100 00
J R Robbins, Trustee....	65	333	33 30
J O Whitney, Trustee....	39	1000	100 00
A Hinds.....	57	1000	100 00
A Hinds.....	58	1167	116 70
A Hinds.....	194	500	50 00
A Hinds.....	108	100	10 00
J K Cooper, Trustee.....	106	100	10 00
J K Cooper, Trustee.....	107	100	10 00
J K Cooper, Trustee.....	108	100	10 00
C A Hunt, Trustes	117	8334	833 40
M Van S Rice.....	200	500	50 00
M Van S Rice	201	500	50 00
M Van S Rice.....	202	500	50 00
M Van S Rice.....	203	500	50 00
T L Bibbins, Trustes....	09	100	10 00
T L Bibbins, Trustee....	100	100	10 00
T L Bibbins, Trustee....	101	100	10 00
T L Bibbins, Trustee....	103	50	5 00
T L Bibbins, Trustee....	120	100	10 00
T L Bibbins, Trustee....	121	100	10 00
T L Bibbins, Trustee....	122	100	10 00
T L Bibbins, Trustee....	123	100	10 00
T L Bibbins, Trustee....	124	100	10 00
T L Bibbins, Trustee....	125	500	50 00
T L Bibbins, Trustee....	132	1000	100 00
T L Bibbins, Trustes....	133	1000	100 00
T L Bibbins, Trustee....	134	1000	100 00
T L Bibbins, Trustee....	130	1000	100 00
T L Bibbins, Trustee....	142	450	45 00
T L Bibbins, Trustee....	146	100	10 00
T L Bibbins, Trustee....	147	50	5 00
T L Bibbins, Trustee....	148	50	5 00
T L Bibbins, Trustee....	150	500	50 00
T L Bibbins, Trustee....	157	100	10 00
T L Bibbins, Trustee....	162	100	10 00
T L Bibbins, Trustee....	163	100	10 00
T L Bibbins, Trustes....	169	500	50 00
T L Bibbius, Trustee....	170	500	50 00
T L Bibbins, Trustee....	174	100	10 00
T L Bibbins, Trustee....	176	50	5 00
T L Bibbins, Trustee....	181	100	10 00
T L Bibbins, Trustee....	185	100	10 00
T L Bibbins, Trustee....	189	50	5 00
T L Bibbins, Trustee....	213	100	10 00
T L Bibbins, Trustee....	216	500	50 00
T L Bibbins, Trustee....	217	500	50 00
T L Bibbins, Trustee....	218	500	50 00
T L Bibbins, Trustee....	219	3000	300 00
T L Bibbins, Trustee....	220	500	50 00
T L Bibbins, Trustee....	221	250	25 00
T L Bibbins, Trustee....	222	250	25 00
T L Bibbins, Trustee....	223	100	10 00
T L Bibbins, Trustee....	232	100	10 00
T L Bibbins, Trustee....	225	100	10 00
T L Bibbins, Trustee....	226	100	10 00
T L Bibbins, Trustee....	227	100	10 00
T L Bibbins, Trustee....	228	100	10 00
T L Bibbins, Trustee....	229	100	10 00
T L Bibbins, Trustee....	230	100	10 00
T L Bibbins, Trustee....	231	100	10 00
T L Bibbins, Trustee....	233	500	50 00
T L Bibbins, Trustee....	234	500	50 00
T L Bibbins, Trustee....	235	500	50 00
T L Bibbins, Trustee....	236	500	50 00
T L Bibbins, Trustee....	237	50	5 00
T L Bibbins, Trustee....	254	20	2 00
T L Bibbins, Trustee....	262	100	10 00
T L Bibbins, Trustee....	263	100	10 00
T L Bibbins, Trustee....	264	100	10 00
T L Bibbins, Trustee....	265	100	10 00
T L Bibbins, Trustee....	266	100	10 00
T L Bibbins, Trustse....	267	100	10 00
T L Bibbins, Trustee....	268	100	10 00
T L Bibbins, Trustes....	269	100	10 00
T L Bibbins, Trustes....	270	50	5 00
T L Bibbins, Trustee....	271	50	5 00
T L Bibbins, Trustee....	272	50	5 00
T L Bibbins, Trustee....	273	50	5 00
T L Bibbins, Trustee....	203	1000	100 00
T L Bibbins, Trustee....	378	97	9 70
T L Bibbins, Trustee....	383	150	15 00
T L Bibbins, Trustee....	384	50	5 00
T L Bibbins, Trustee....	303	50	5 00
T L Bibbins, Trustee....	424	100	10 00
T L Bibbins, Trustee....	425	100	10 00
T L Bibbins, Trustee....	426	100	10 00
T L Bibbins, Trustee....	427	100	10 00
T L Bibbins, Trustee....	428	100	10 00
T L Bibbins, Trustee....	429	100	10 00
T L Bibbins, Trustee....	430	100	10 00
T L Bibbins, Trustee....	431	100	10 00
T L Bibbins, Trustee....	436	1000	100 00
G R Cottrell, Trustee....	144	1000	100 00
G R Cottrell, Trustee....	166	500	50 00
J Colman, Trustee.....	354	100	10 00
M French, Trustee.....	346	1000	100 00
H R Taylor, Trustee.....	349	50	5 00
Jos F Nounsan, Trustee.	361	100	10 00
Jos F Nounnan, Trustee.	366	100	10 00
J Griswold, Trustee.....	441	6900	690 00
Unknown.....	247	30	3 00
Unknown.....	249	8	80
Unknown.....	251	65	6 50
Unknown.....	253	30	3 00
Unknown.....	255	30	3 00
Unknown.....	259	42	4 20
W Townsend, Trustee....	410	1000	100 00
W Townsend, Trustee....	411	500	50 00
W Townsend, Trustee....	412	500	50 00
J M Hinkle, Trustee.....	369	1700	170 00
T A Wright, Trustee.....	294	1000	100 00
T A Wright, Trustee.....	370	300	30 00
T A Wright, Trustee.....	307	20	2 60
T A Wright, Trustee.....	309	1000	100 00

Names.	No. Certificate.	No. Shares.	Am't.
J R Robbins.....	357	20	2 00
G L Waters, Trustee.....	419	200	20 00
W J Gwynn.....	402	1000	100 00
Geo O McMullin, Trustee	421	500	50 00
M K Lauden, Trustee....	287	250	25 00
M K Lauden, Trustee....	288	250	25 00
M K Lauden, Trustee....	390	1000	100 00
M K Lauden, Trustee ..	391	1000	100 00
M K Lauden, Trustee....	392	1000	100 00
M K Lauden, Trustee....	393	1000	100 00
M K Lauden, Trustee....	394	1000	100 00
E A Richardson, Trustee.	315	500	50 00
E A Richardson, Trustee.	316	500	50 00
E A Richardson, Trustee.	317	500	50 00
E A Richardson, Trustee.	318	500	50 00
E A Richardson, Trustee.	319	500	50 00
E A Richardson, Trustee.	320	500	50 00
E A Richardson, Trustee.	321	500	50 00
E A Richardson, Trustee.	322	500	50 00
E A Richardson, Trustee.	323	500	50 00
E A Richardson, Trustee.	324	500	50 00
E A Richardson, Trustee.	325	500	50 00
E A Richardson, Trustee.	326	500	50 00
E A Richardson, Trustee.	327	500	50 00
E A Richardson, Trustee.	328	500	50 00
E A Richardson, Trustee.	329	500	50 00
E A Richardson, Trustee.	330	500	50 00
A H Todd & Co., Trustee.	418	200	20 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 314 Bush street, San Francisco, on Thursday, the 11th day of March, 1880, at the hour of —o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

T. L. BIBBINS, Secretary.

Office—314 Bush street, San Francisco, California.

OFFICE OF THE

Original Gold Hill Gold and Silver Mining Company,

Gold Hill Mining District, Storey County, Nevada.

NOTICE!

A special meeting of the stockholders of the Original Gold Hill Gold and Silver Mining Company will be held at the office of the Company, rooms 3 and 4, second floor, 309 California street, San Francisco, on Monday, the 15th day of March, 1880, at 2 o'clock P. M., for the purpose of disposing of the stock belonging to the Company, and such other business as may legally come before said meeting. Transfer books will be closed on Saturday, the 6th day of March, 1880, at 3 o'clock P. M.

J. M. BUFFINGTON, Secretary.

DIVIDEND NOTICE.

Office of the

STANDARD CONSOLIDATED MINING CO.,

San Francisco, March 2, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 13) of Seventy-five (75) cents per share was declared, payable on Friday, March 12th, 1880, at the office in this city, or at the Agency of the Nevada Bank of San Francisco, in New York.

WM. WILLIS, Secretary.

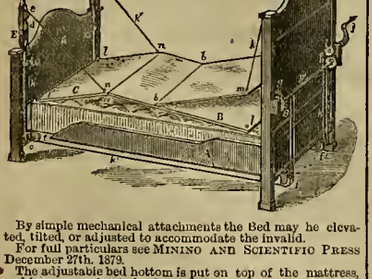
Office—Room 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

Manufactory, 17 & 19 Fremont St., S. F.

The Archer Patent Invalid Bed.



By simple mechanical attachments the Bed may be elevated, tilted, or adjusted to accommodate the invalid.

For full particulars see MINING AND SCIENTIFIC PRESS December 27th, 1879.

The adjustable bed bottom is put on top of the mattress, and by means of noiselessly operating cords and pulleys the patient may be put in any desired position.

The bed is adapted for persons in good health who wish an easy position, as well as it is for invalids.

This bed is of the latest improved form, with a view to simplicity, convenience and ease to the occupant.

A limited number of State and County Rights for sale.

Orders for the Patent Bed can be filled immediately.

Satisfaction will be given to those desiring to interest themselves in the manufacture or sale of this article.

JAMES H. ARCHER,
Madison, Yolo County, Cal.

A. S. HALLIDIE.

Office, No. 6 California Street,

SAN FRANCISCO.

Manufacturer and dealer in all kinds of

Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire

Of all sizes on hand or made to order.

Barbed Fence Wire.

Sole Proprietor of

Hallidie's Endless Ropeway,

For the Transportation of Ores, Etc.

Send for a Circular.

A. S. HALLIDIE.

Office, No. 6 California St., San Francisco.

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BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings

Hooker's Patent Celebrated

STEAM PUMP

The Best and Most Durable in use. Also, a variety of other

PUMPS

For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF

IRON PIPE AND MALLEABLE IRON FITTINGS

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES.

To Railroad Men, Mining Superintendents, Street Railroads and Lumber Dealers!

The undersigned are prepared to furnish prices and all particulars for

Broad and Narrow Gauge

LOCOMOTIVES!

From the Baldwin Locomotive Works,

For Freight, Passenger, Logging Coal or Gold Mine Service.

BALDWIN

Steam Street Car Motors,

For use on City or Suburban Roads.

Railroad Iron, Spikes, Bolts, Etc.

From the best Eastern manufacturers.

CARS FOR FREIGHT, PASSENGER

Or any other service.

Also, STREET CARS, from the Billeneyer & Small Co., York, Pa.

Wheels of every Size and Description

From A. Whitney & Sons, Philadelphia.

WILLIAMS, DIMOND & CO.,

202 Union Block, junction Market & Pine Sts., San Francisco

Ready Roofing

AND

GRANITE CEMENT.

The most durable and cheapest Roofing in the world. Every man can roof his own house.

READY ROOFING CO., of New York.

Agency, 413 Pacific Street, San Francisco.

SUB-IRRIGATION.

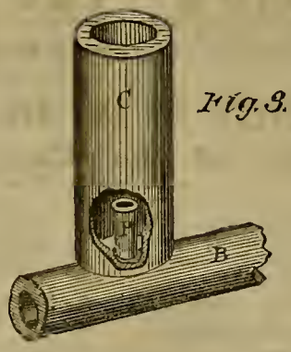
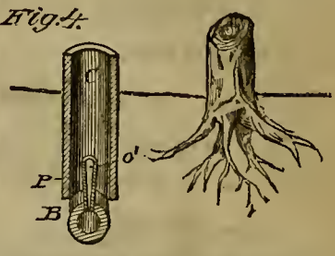


Fig. 3.

Fig. 4.



—FOR—

Orchards, Vineyards, Small Fruits, Alfalfa, Lawns, Vegetables, Etc.

The Asbestine System consists in conducting the water in conorete pipes laid below reach of the plow.

It savcs from three-fourths to nine-tenths the water used in surface irrigation.

It is under perfect control, and can be applied wherever irrigation is needed.

The surface remaining dry there is no need of Summer Cultivation, either before or after irrigating.

The soil is never excessively wet *and cannot bake*, but remains moist, loose and at a nearly uniform temperature, promoting a long-continued Summer's growth.

Aoything which the soil lacks as plant food (manure, lime, etc.,) can be easily, directly and economically applied in liquid form; the pest of the vineyard—phylloxera—can thus be easily reached.

No grading is necessary, as the system works perfectly on hillsides and undulating land.

Roots *cannot* get into the pipe, neither can it *suck mud*—difficulties never overcome by any other system of sub-irrigation.

The pipe is made cootinuously with a recently patented machine which *makes and lays* it in the trench, following all the undulations and curves.

Water is not kept in the pipes; but is applied abont twice a month.

Three men will easily lay 1,200 feet of two-inch pipe in 10 hours.

This system and machines used are fully protected by U. S. Patents.

Our pipe machine makes the cheapest and best tile drain known, and is especially valuable for making and laying pipe for conducting water from springs, ont of canyons, etc.

For further ioformation, circulars, etc., address WILSON & BROWER, General Agents for California, Sacramento, Cal., or

Asbestine Sub-Irrigation Co.,

Los Angeles, Cal.

PACIFIC MACHINERY DEPOT.

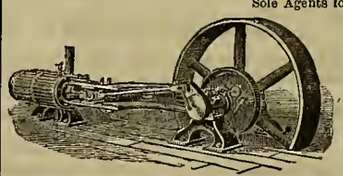
H. P. GREGORY & CO.,

Nos. 2 and 4 California Street, San Francisco.

Importers and Dealers in every description of

MACHINERY!

Sole Agents for the Pacific Coast for



BUCKEYE

Engine Company.

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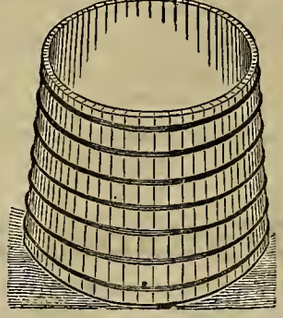

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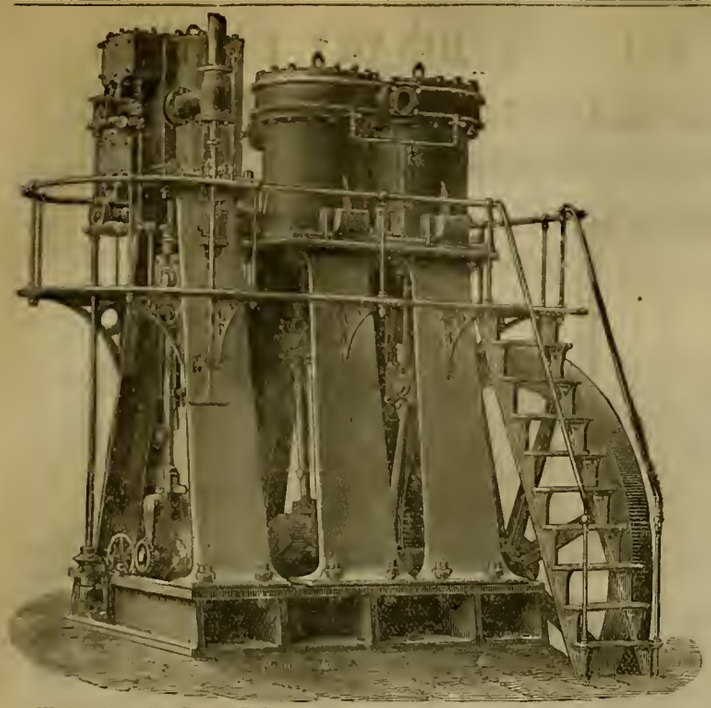

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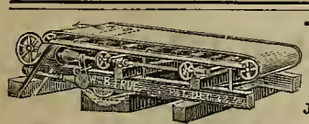

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VOLUME XL Number 11.

The Mining Boom.

From all portions of the great mining fields of the country we are daily receiving evidence of the rapidly increasing favor into which the mining industry is rising. The most conservative and cautious people are losing their timidity, and are embarking in mining ventures with a boldness that surpasses the operations of veterans in the same ranks. All classes of those who have any money to invest look upon mining as being paramount to all other means of increasing their capital. Neither age, sex or occupation place any bar upon the actions, in this line, of individuals. From the bootblack to the banker, through all the intermediate grades of capital; from the corn doctor to the surgeon of consummate skill; from the constructor of wheel-barrows to the builder of the most intricate steam engines; from the scullion in the kitchen to the millionaire owner of the palatial residence; and through every phase of social life, from the lowest to the highest—all are swelling the grand army of stock buyers, and becoming thereby co-partners in mining properties.

This is not to be wondered at when the rapidly increasing yield of the mines is taken into consideration. It ceases to appear like an infatuation when we meet the daily records of new and rich discoveries of mineral veins. Were not the facts substantiated by the production of million as positive testimony, it might seem that a glamour was cast by some magic spell over the entire community. But it is no transitory vision, it is no evanescent delusion—it is a fixed and permanent reality. The miner's pick is more potent now than was the magician's noted talisman of bygone ages. At its practical stroke, from the darkness of the mine it brings to light the yellow gold, the glistening silver, the bright brown copper, the more ductile lead, and the sombre-hued iron. It opens receptacles of hidden treasures, that since creation's dawn have awaited its sturdy blows to break away the casement that enclosed them. It wields more power than did the subtle spells of the alchemist eons of years ago, and transmutes the crumbling rock into bright, pure gold. It sends the unsightly ore to the furnace, from whose fusion is extracted the noble metal.

And what is more remarkable still, is the sudden and universal development of all this mineral wealth. The fields which our grandsires tilled are found to hold beneath the depth which their plowshares reached crops of such exceeding richness, that the product of a single acre would thrice fold pay the original value of the farm. The waste and barren mountains hold within their veins, crops of more value than the most fertile plains could ever produce. Nor are such instances isolated ones. Every where throughout the country, where the presence of metallic deposits were not even thought of, rich yields are extracted from the new mines that are opened. The young men who left their homes in the Eastern States to join the gold seekers of California in the days of '49, have gone back matured in years, and educated by experience in practical mining, to see even at the thresholds of the old homesteads, and under the surfaces of the old farm fields, mines that rival in richness those of the Pacific shores.

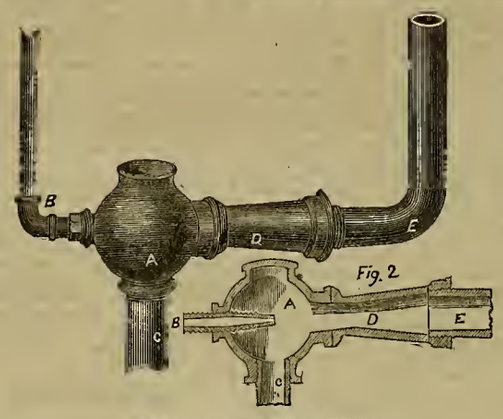
From the *Maine Mining Journal* we learn that 27 mines were recorded in January and February of the present year, the aggregated capital stock in them amounting to $13,500,000. They are yielding richly in gold, silver and copper. From the Carolinas, Virginia, Georgia and Tennessee, new developments are being made, and many old mines reworked. From the galena regions new discoveries are noted of richness in excess of all previous ones.

From New Mexico, Arizona, Colorado, Montana, Idaho, Utah, Nevada and California, the notices of strikes come so numerous and frequent that only a passing mention of the most important of them can be made. Ore containing from 500 to 2,000 ounces of silver to the ton is often reported. There are mines that are putting out from $5,000 to $10,000 per day. If the attempt were made to name all the mines that are yielding over $100 daily, there is not a journal in the United States that could find space enough in its columns to do so. With such rich strikes and so generally distributed as they are, it is evident that the mining "boom" must continue to increase both in the investors and amount invested, and in the yield from the mines that has brought it into existence and still keeps it in progress.

There is evidently a rich future in store for our country from the product of this industry. It is now receiving an impetus that will extend its production. It has not yet attained its maximum of output, and from its capabilities of producing it may safely be stated that it has only commenced to display its power of yielding treasure. If its real future could be accurately set forth now, the statement would be deemed a wild fiction or an impossible romance, and yet, that statement would not be an exaggeration.

The American Steam Siphon.

We give an engraving herewith of the American steam siphon, manufactured in this city, by W. T. Garratt & Co. *A* is the body of the siphon; *B*, the steam pipe; *C*, the suction pipe; *D*, in Fig. 1 is the reducing pipe; *D*, in Fig. 2, the throat. The operation is as follows: Steam is turned on through the steam pipe, *B*, and rushes across the globular chamber, *A*, into *D*, carrying the air into *A* and *D* before it, thereby exhausting the air from *A*. Water to supply its place rises through the suction pipes, *C*, from atmospheric pressure, as in ordinary suction pipes, when the steam jets force it onward through *D E* with a velocity proportioned to the pressure in the steam boiler.



AMERICAN STEAM SIPHON.

ANOTHER COMET.—The Smithsonian Institution has received from the Astronomer Royal of England the announcement of the discovery by Gill, at Cape Town, South Africa, on February 12th, of a comet in 8 hours 58 minutes right ascension, 12° 31′ north declination, with a daily motion of 2° 35′ in right ascension and 20′ south

An Improved Billiard Table.

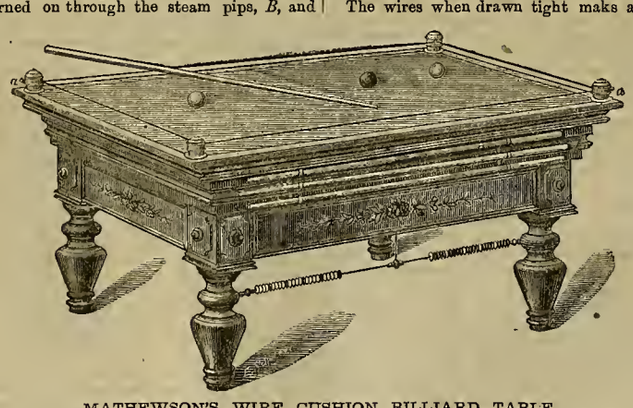
We illustrate on this page an improvement in billiard tables, for which Mr. S. R. Mathewson has recently applied for letters patent through the MINING AND SCIENTIFIC PRESS Patent Agency.

The special feature in the table is its peculiar cushion, which, instead of being solid rubber, is made of a piano wire stretched tight, the elasticity of which answers the purpose of the ordinary cushion. These wires cross each other inside the corners of the corner studs, so that the ball can never touch the studs. A very ingenious and easily arranged method is employed to keep the tension of the wires perfect, this mechanism being in two of the corner studs, so the wires can be tautened at any time.

The bed of the table is made of a peculiar composition formed in a plastic state and allowed to harden. This when smoothed off is covered with cloth in the usual way, and is perfectly solid in its wooden bed, but not half as heavy as the ordinary beds. The screw and wedge principle is applied to the leveling device on the legs, so an accurate adjustment is possible.

The wires when drawn tight make a much more elastic cushion than those of ordinary form, and the balls can be driven many more times across the table than when a rubber cushion is used. The cue can be passed under the wire when desired, so some shots are possible which cannot be made with a solid cushion.

Mathewson & Co., 28 New Montgomery street, under Palace hotel, have several different sizes of this table, some of them for children's use. The ordinary size is the same as that commonly used. The simplicity of construction enables the manufacturers to make them for a great deal less than the tables in ordinary use. The piano-wire cushion is rubber coated so the balls are not bruised, and there is no more noise than with a rubber cushion.



MATHEWSON'S WIRE CUSHION BILLIARD TABLE.

Battery and Copper Plate Amalgamation.

At the recent annual meeting of the American Institute of Mining Engineers, Prof. R. H. Richards, of the Massachusetts Institute of Technology, read a paper upon "Battery and Copper Plate Amalgamation." The paper was prepared from notes made by him during a series of experiments which have recently been made at the mining laboratory of the Institute, with a small five-stamp mill, with a view to a careful investigation of the conditions most favorable to a higher yield from gold ores than is generally obtained in ordinary mill practice. In the progress of these experiments, Prof. Richards soon found that two sources of error tended to vitiate the results. One of these sources of error, and the one to which he attaches the greatest importance, he terms the "overlapping error," which is due to the circumstance that the amalgamated copper plates require, before attaining an efficient condition, saturation with a certain amount of gold, which does not appear in the returns when ordinary scraping of the plates is resorted to. He therefore adopted the plan of using a new set of the thinnest copper plates obtainable for every experiment.

The results arrived at with two different kinds of ores—one from Canada and the other from New Hampshire—strikingly illustrated the difference of the condition of the gold. In one case almost all the gold was obtained from the plates within the battery, while very little would be gathered from the copper plates and the mercury trap. The fact that a large portion of the gold was deposited on the plates outside of the battery in the second case, proved in how finely divided a state the precious metal was in the ore. He had found, during the course of his experiments, that plates saturated with *silver* amalgam would act promptly in taking up gold, so that plates so prepared helped him to overcome the errors due to the inaction of fresh plates. With these precautions he had succeeded in saving 85% of the assay value of the ores.

In the discussion following the reading of the paper, Mr. Park, who incidentally mentioned a new process for deoxidizing copper, stated that he had found that plates free from oxygen would not take up gold. Prof. Silliman, who spoke highly of the line of experiment followed out by Prof. Richards, pointed to the experiences of mill managers in the Black Hills and elsewhere, who all recognized the fact that the first runs of a new mill are far behind the later returns—a circumstance which was undoubtedly due to the fact that the copper plates must first be saturated.

He spoke of recent practice at Bodie, where the difficulty of working ores with extremely fine gold was overcome by using a minimum of water and pumping the water back into the battery, where is was used over and over again. Mr. N. S. Keith said that a spongy condition of the plates was a necessity for good work, and explained the manner in which it was probably formed, corroborating Mr. Park's observations.

Mr. O. Heinrich, referring chiefly to the working of Southern ores, spoke warmly against the prevailing practice of fast driving of mills. He pointed, as an example of close working, to the old practice in the Tyrol, and urged the necessity of more cautious and careful stamping. It was owing to this unskillful use of the stamp mill that justice was not generally done to it.

IN San Domingo, on February 10th, an insurrection broke out in the south. Gen. Antonio Castello, the leader of the insurgents, was killed, with six companions. In the capitol 16 persons implicated in the movement were under arrest. It is expected that they will be executed. The government was master of the situation.

IN the center of the Malheur river, near the Stone house, in Baker county, Oregon, is an island 20 or 30 feet in diameter, out of which gushes hot water. The island is covered with grass, and the phenomenon is an interesting one.

AN energetic effort is being made by the leading citizens of San Francisco to stop the incendiary talk of the labor agitators.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Meadow Lake—Its Past, Present and Future.

[Written for the PRESS.]

The Gould Process.

Meadow Lake, like many other old landmarks in California has had its ups and downs, and fallen into decay. In its early days it prssented all the features that oharactsrizs the average miniug district on the coast. Many a sturdy miner put up his last dollar in claims and town lots, and like Sellers, in the "Gilded Age," saw "Millions in it," and eventually had cause to mentally curse ths luck on general principles that induced him to go thither. Dwellings, hotels and husiness houses sprung up like mushrooms, on the very crests of the Sierras, and their rsmains have stood since its dssartion like so many specters of its former condition.

But from prssent indications, "Richard will be himself again." Capital and intelligent lahor have again directed their attention to Meadow Lake, and its refractory and rehellious ores have to yield their treasures "to man'e relentless dominion." Your correepondent is indebted to Mr. Jamee Gould for valuable information concerning the process used hy him, and by his request makee it puhlic to the world.

The process in Truckee is known as the Gould process. Gonld does net claim this as hie private property, and any parties visiting Meadow Lake will he given every opportunity to inveetigate the process thoroughly. It is no secret, and every man owning or interested in mines there is familiar with the process. An air of mystery has so prevaded all the alleged processes for reducing these ores to euch an extent that the public have lost confidence in any and all attempts made in that direction. It is a well demonetrated fact that the hard common eense of the practical miner has done more to develop the mining industries of the coast than all the fine-spun ecientific theories of the scientist and alchemist.

Mr. Gould is a practical amalgamator, having made that his husinese for over 20 years in the different qnartz districts of California; also at the Black Bear and Klamath mines in northern Califrnia. He ie indebted to Mr. George F. Deetkin, a gradnate of Freiburg, for a large part of his euccess. I will try to give, in Mr. Gonld'e own language, his treatment of the ore. Any practical millman acquainted with quartz reduction, knowe to dry crush quartz, the ore is first dried hefore crushing. The ore at Meadow Lake ie first cruehed by a dry crushing mill, and then roasted "in a reverheratory furnace, without salt," to dead roast. The amalgamation is then made with the ordinary iron pan.

Samples of the Meadow Lake ore assayed by Prof. Price, of San Francisco, went $97 per ton. The tailings showed $2 gold and $3.50 silver per ton. Several runs were made the last eeason on rock from the Grant mine, with an eight-stamp mill which gave very eatisfactory results. One run of 13 tone from the Grant mine, milled by this eystem, produced 95% of the assay, or in the aggregate, $1,285.

From the experience of the past season Gould is satisfied the ore can be worked at a coet of $5 per ton. Some chronic doubters will say that this process may work the Grant ore, and not other ore from different lodee in the district; hut we answer them hy eaying that oree from nearly all the lodes have been worked by this process on a small ecale successfully. The ealt is the leading feature in the process. Nearly all the so-called processes have failed on account of using salt in the roasting process.

Mr. Frank Pausen, of San Francisco, a man of means, is interested largely in Meadow Lake. J. L. Lemson & Co., of Truckee, and numeroue hardy miners, with good practical experience, are engaged, and active operations will he reenmed this season and pushed vigorously. The parties interested are eatisfied that the ores can be worked and pay a handsome profit. Among the companies organized are the Carlisle, the U. S. Grant Co., Girard Center, Gazelle and Meadow Lake Con. The Grant Company have already sent a force of men to take out rock, and expect to make a run on 60 tone of rock as soon as the weather will permit. Mr. Booth, an expert from San Francisco, wae up to the district the past season, and was astonished at the simplicity and the results attained. The Grant Company have lahored under considerahle difficulty thie season, have heen at great expense in fitting up aud getting the property in rnnning order, hut they have heen successful, and Meadow Lake rock has paid the bills.

From Cisco, on the C. P. R. R., to Carlisle, the distance to Meadow Lake ie nine miles by the trail. There is a wagon road from Truckee, on the C. P. R. R., the entire distance of 23 miles. Machinery and supplies were brought in by this route the past season, and Truckee will he the depot for everything going that way; and from every indication Meadow Lake will again be one of the most flourishing mining dietricts on the coast. The district is a perfect network of quartz lodes, and a great many hona fide locations have heen made.

Mr. Gonld is entitled to oredit for his successful efforts to reduce these refractory ores to subjection. Meadow Lake ores have heretofore defied the combined attacks of the scientist and his crucihle, hut this plucky little Irishman demonstrated heyond douht that they can he worked, and worked profitahly.

Any persons visiting the district will be furnished evsry facility to investigate thoroughly; and as to douhting Phillips' and Thomas', ws say come and see. Ahout the middle of June the roads will he passahle, hut owing to snow, at pressnt it is difficnlt to make the trip.

GEORGE E. MARSHALL.

Truckee, Cal., Feh. 18, 1880.

Tellurium in Mariposa County.

EDITORS PRESS:—In looking over a lats number of your excellent paper I noticed a communication, from the pen of Prof. Joseph LeConte, on "The Mineral Known as Tellurium." Ac cording to the learned gentleman's statement, this valuahle substance is only found in a very small portion of this State, and that is in the counties of Tnolnmne and Calaveras. Now, I do not profess to he a scientific mineralogist, hut if Prof. Le Conte will extend his ohservations to Mariposa county, I will guarantee to show him plenty of mines the ore of which carries quite a percentage of genuine petsite tellurium; which in return yields from 40% to 45% in gold. But it must not be expected that a sulphuret carrying such a large percentage of the preciove metal is found in large masses like the sulphurets of iron, galena, and others too numerous to mention.

The telluridee of gold are ahout as scarce as the gold itself, and I have always noticed in working in a mine which has any tellurium. that when the ore is rich in gold it is likewise rich with the other mineral. Perhape just at the present time the Virginia mine, located on the mother lode, three miles southeast of Coulterville, is the richest mine we have in this county in tellurium. At any rate the average assay of the ore is from $800 to $1,000 per ton.

Then we have the Eureka, Compromise, Bandareta, Scanlan, Hasloe, Mary Harrison, Furgerson, Hite, Pine Tree and Princeton mines, in all of which the ore carries more or less tellurium. The Princoton mine is one of the richest in this county, having produced $3,500,000 in 700 feet of depth; and whenever the ore was paying from $40 to $200 per ton in gold, it wae very rich in tellurides. The Hite mine, down now ahout 800 or 900 feet, and which has been worked continuously for the last 18 years, has produced at least $2,000,000, and in this there ie more or less tellurium in the quartz. Four miles from the latter, and on the eame range, ie the Furgerson mine, which has heen worked for the last 16 years, and is down 700 feet. It has made the original owners rich, and the ore carries tellurium from surface oroppings to the hottom of the eump. The Washington mine, near Hornitos, is the deepest one we have in this county, being down 1,200 feet. It has paid its regular monthly dividend for years, and is improving in depth; has had tellurium from top to hottom.

Suffice it to say that every deep mine in thie county which has paid its way from the surface croppings down to the present workings, has what is termed tellurium in the ore. We are etrongly of the opinion that tellurinm is to he found, in eome form or other, in every rich gold quartz mine in this State. In eome mines the tellnrides may be so thoroughly hlended with the other sulphnrets as not to be distinguishable nnder an ordinary fire assay, for it is of euch a volatile nature that, in order to get a correct test, the ore must he worked with great skill, and assayed for the tellurium alone. It is only within the last decade that it has attracted much attention for the gold it contains, and hence it is that so few miners know anything about it, or know it when they see it.

S. RUDOLPH.

Feh. 24, 1880.

A FINE MINE.—The Carson *Appeal* furnishes the following little hit of satire: Gen. Batterman, Superintendent of the State Prison mine, furnishes the following encouraging report: He has now 143 men at work on ore level and taking out the finest quality of rock. There has in fact heen no change in the appearance of the formation since his last report. Car eamples show high assaye of granite of the best quality, and the experts believe that they are in as fine a hody of huilding rock as can be found in the State. Little or no water is encountered and the pump ie running at ahont ten strokes per day. The tunnel, opened hy some parties who were anxious to drift off into California and New Mexican ground (to visit some relatives), has been closed np, as it was encountering an unfavorahle formation of wardene and ehotguns. The cages are all in good order and furnished with excellent eafety catches. The ventilation in the lower level of the prison floor has been somewhat improved by an upcast winze connecting with the roof. By the next visiting day they expect to show eome good work in the north drift. There ie still room for a few more men on the day shift. Applications for work can be made Judge King, of the District Court, or Sheriff Hill.

The Richmond Mine.

An exchange speaks as follows of the Richmond Con. mine at Eurska: The Richmond, of this district, is perhaps the greatsst mins in ths world to-day. The developments of ths last six months are simply marvelous. It is no secret that the mins is looking hettsr, at the prssent time, than ever hsfore in its history. From the 200 lsvsl along down to a point far hslow the 600, thers is such a mass of choice ore as was never disclosed, to our knowledge, anywhere in any mining property in the United States, not excepting the celehrated Big Bonanzas of the Comstock, which yisided to their fortunate shareholdsrs such fahulous returns as to practically glut and depreciats the silver markets of hoth the old and the new world. The Richmond honanza has a demonstrated depth of over 400 fset, and at such points as crosscuts have been run, it is shown to have a width of more than 200 fset; that is to say, they have a column of ore approximating 500 fest in hight hy 200 fest in width. How much deeper it goes no man can foretell, though thers is every indication that it extends into the earth indefinitely. It is a peculiarity of ths ore hodies of Ruhy hill that they terminate in immense heds, the first sections of the chute heing merely the stem of the pear, as it were. Should this theory hold good in the present instance, and there can hs no douht that it will, the Richmond bonanza must widen into acres of good ore when a sufficient depth shall have heen attained. This portion of the mine being comparatively virgin ground, there is no estimating the great value of the development now progressing with such satisfactory results at every stroke of the pick, for, if we are correctly informed, every day witnessee a marked improvement. The ore, too, is of a much higher grade than has hitherto ruled in the minee of Ruby hill, running on an average, say, $80 per ton. The body, as a whole, is also freer of waste material than usually obtaine. The Richmond is, in a word, a grand mine, whose unparalleled promise and value can scarcely be computed at this writing. There is ore enough in sight to run the furnacee at their fullest capacity for more than two years, without the development of another ounce. Where is the next mining property on the face of the glohe in whose favor as much can be said?

The future of thie magnificent property cannot be too highly appreciated by the people of thie community, guaranteeing as it does permanency and prosperity to every interest here dependent npon the mining industry. Director Prohert, Manager Rickard and Foreman Longley are also to be congratulated on their excellent management and the hright prospects of the company. These gentlemen, in their respective spheres, have ably and sufficiently promoted the success of those whom they so faithfully represent.

The Mineral Riches of Japan.

The Japanese have now a completely organized geological survey, somewhat similar to our own, with a full etaff of native eurveyors, under an American chief, Mr. B. S. Lyman. The first report of progress of thie survey, for 1878 and 1879, has just been published, and contains eome accurate and valuahle information on the mineral wealth of the country. Mr. Lyman describes a survey journey which he made with some of his etaff from June, 1878, to February, 1879, extending over a dietance of 2,800 miles. Mr. Lyman reckons that the coal fields of Western Japan contain abont 620,000,000 tons, and if one-third be deducted for the working, there will remain 400,000,000 tone, representing a value at the cost of $1,000,000,000. Inconsiderahle as this ie in comparison with the large and rich coal fields of other lands, it is quite equal in value to all the metal products together, except iron. The copper of all the workable mines ecarcely reaches the value of $750,000,000; the 8 or 10 gold and silver mines, which were formerly worked and may be eo again, may, including the lead, antimony and tin mines, the workability of which ie doubtful, be valued at not more than $250,000,000. On the other hand, the value of the iron amounts to at least $250,000,000,000, or 250 timee more than that of the coal. The relative importance of the mineral products of Japan (excluding Yesso and the small coal fields of Kii, Ise, and Iwaki) may be represented hy the following numbers: Iron, 1,000; coal, 4; copper, 3; and all other metals (chiefly gold and eilver), 1. The total value of these products reachee the sum of about $252,000,000,000—*i. e.*, just as much as the coal fields of Yesso, which in other respects is eo poor in natural products. Mr. Lyman gives some details concerning 24 of the hot springs in Shimotsuke, Iwashiro, Uzen, and Ugo, and a table of the petroleum eprings of Japan, according to which hy far the most numerous and most productive are in Echigo and in Akita Ken, and the total delivery in the year 1879 was 4,525 gallone per day.—*London Mining Journal.*

UTAH has 285 stamps for crushing ore, thns distrihuted in the different mining districts, viz: Beaver, 20; Bingham, 40; Camp Floyd, 20; Hoinansville, 10; Ophir, 10; Park, 80; Silver Reef, 38; Stockton, 13; and Tintic, 52. The 285 stamps are in 19 miles, including five in Silver Reef, three each in Tintic, Park and Bingham, and one each in the others. There are also 23 etacks for reducing smelting ores, hut not more than a dozen run regularly. At several places silver is extracted by leaching.

The Corundum Mines of North Carolina.

The name "corundum" is applied to all crystallized alumina. It is the hardest mineral in the world, except the diamond, and whsn in ths crystalline form and transparent constitutes the Oriental gems, the sapphire, ruby, emerald, topaz, etc., which are of great value, some eveu exceeding the diamond, hecanss they aro mors rare. It is used for ahrasive purposes, hut as yet a sufficiant quantity has nevsr heen found in this country to taks ths place of emery. It is much hardcr than emery, performing the work in less time.

Corundum occurs in ths great chrysolite helt extsnding from the southern part of Virginia to middls Alahama, passing in a southwestsrly direction through the mountainous portion of North Carolina. Iu the southwestern counties in ths Nantahala range of mountains (one of the spurs of the Blue Ridge), and lying on either side of Buck creek (a trihutary of ths Tennessee), at an elsvation of from 3,000 to 4,000 feet, is the so-called Cullakenes corundum mines, which has heen considered the largest dsposit of corundum in this country. It covers an area of 300 acres. This mine was purchased in April, 1879, hy Herman Behr & Co., and has heen worked since May, with what success is not reportsd.

In Macon county, N. C., on the western slops of the Blue Ridge, at an elevation of ahout 2,500 feet, is Corundum hill, formerly known as Cullasagee mine. This mine was discovered in 1872; it was afterwarde purchased by E. B. Ward, and worked for 18 monthe hy Col. C. W. Jenke, of Boston. Rumor eaye that gems of exceedingly great value were taken out. In July, 1878, this mine wae purchased by Dr. H. S. Lucas, for the Hampden Emery Co., of Chester, Mass. They commenced mining August 20th, and up to the present time have taken out 200 tone of corundum; also, in washing some of the dumps left there when worked by Col. Jenks, were found many fragments of the Oriental gem, perfectly transparent and of very great hrilliancy. Among these is an emerald weighing 30½ carats, and eeveral ruhies of the finest color.

In the eastern part of Jackson county, N. C., at the foot of one of the highest peaks of the Blue Ridge, is what is termed the Hog Back mine. Thie mine was operated for a limited season by the Hampden Emery Co.

Northweet of the Pigeon, in Heywood county, N. C., is still another deposit of corundum, called the Presley mine, which has been worked since one year ago last March.

In Madison and near the Buncombe county line, in the eame State, is an outcropping of chrysolite, carrying corundum, which covers an area of 75 acres, and has heen worked for the Hampden Emery Co. for the past scason.—*Scientific American.*

A Lucky Fall.

The Sonora *Independent*, says: The most singular mannor of heing struck with a fortune in prospecting that we ever heard of occurred ahove Spring gulch on Sunday last. Mr. Snow, late of San Francisco, now prospecting in this vicinity for other parties, was out on a quartz hunt with Dr. Drake, of San Francisco. They were returning home, it heing stormy, when Snow (who was riding a horse along the trail) was suddenly missed hy his companion. Snow'e horse had slipped off the bluff, and down he went at an angle of 45°, horse, rider and rifle (which he grippled firmly in his hand), rolling over and over in the enow, nntil he brought np against a mase of stone etanding out of the snow, its top covered with moss. He was not hurt ae the cold, soft cushion had saved his bones from the hard ground beneath. Scrambling up against the rock, he noticed that it was quartz, and where the horse had accidentally kicked of the moss something glittered. His eyes "hugged" out, but he did not etop to hrush them off, his hande were too husy clawing off the moss. Darkness coming on he had only time to hreak off a few specimene, which are filled with pure ore. One small piece, exhibited in town, was estimated to he three-quarters gold. Tone of it are apparently etill awaiting its owner. Snow says the vein is about 30 feet thick, and in his impnleive generosity he gave away several ehares eon after his arrival. He told us that he "would not look at $25,000 for his interest." It ie without doubt the richest mass of quartz ever discovered in thie county, except the Divoli honanza, recently opened here in Sonora. Of course, he told us to keep it ont of the paper; hut the caution we find to he getting monotonous. Mr. Snow is very well known in San Francisco as an actor of merit, and a gentleman well-deserving the good fortune he has "tumhled to." Some men are born rich, others have riches thrust upon them, bnt Mr. Snow has drifted through air and snow, right slap up against a pile of richness that would make old Rothschild'e keen eyes turn green with envy.

SUTRO TUNNEL.—February 22d was measnring day. The south header is not running. The north header was then 644 feet from the parallel of the C. & C. shaft. The north lateral runs 100 feet west of the C. & C. shaft and the distance from the end of the curve is 2,738.378 feet. This curve adds 25 feet to the length of a direct line to the center of the tunnel, making the north header at the time of the measurement a little over 2,179 feet in length, and carrying it some 66 feet into Con. Virginia ground.

MECHANICAL PROGRESS.

New Process for Making Bessemer Steel.

A new process, invented by Mr. Jacob Reess, of Pittsburg, is thus described:

In order to properly explain the advantages of the new process, it should be remembered that the iron *per se* is of the same quality wherever found or by what process produced. The different qualities of iron known as pig metal, cast iron, wrought iron and steel, are covered by foreign matter, which accompany the ores or has been incorporated with the metal in its manufacture. All processes employing different agents produce different results; hence the Catalon process produced the charcoal bloom iron; Cost'a process gave us the puddled iron; the cementing process gave us German steel; Huntsman'a process gave us crucible cast steel; Bessemer gave us Bessemer steel, and more recently the open hearth process gives us a still different quality of steel.

The Bessemer and open hearth process appeared at first to threaten the extinction of all processes except the blast furnace, but in practice it was discovered that neither of these processes was competent to eliminate phosphorus from the iron; and not until the Bessemer patents had expired was this difficulty practically removed. Now, by the use of my dephosphorizing process, all grades of metals may be converted into iron or steel, both in the Bessemer converter and in the open hearth.

In practice it has been found that, while the Beasemer process is best adapted to produce rails, etc., the open hearth process produced soft steels to the best advantage. In the present ordinary open hearth practice, and for which I hold the patent in this country, it requires eight hours to convert pig metal into steel. The first six hours and a half is consumed in decarbonizing the metal. By the new process I am enabled to decarbonize the metal in ten minutes, thus shortening the time consumed by the open hearth process 80%. In producing soft steel by the open hearth, the high heat required to decarbonize the metal was very destructive on the furnaces. Now, by the new process, the metal is practically decarbonized and desiliconized before it gets to the furnace, and as a result soft iron or soft steel will be produced cheaper than steels high in carbon. The process is especially adapted to the requirements of the merchant trade, as different grades of iron or steel may readily be produced to fill orders in such quantities as may be required. The plant may be constructed to produce 100 tons.

Friction of High Velocities.

The subject of friction at high velocities, especially with reference to the friction of hearings and pivots, of brakes, etc., is one to which much less attention has been given than the importance of the matter seems to demand. Very meager reports have been placed upon record even of the work that has been done. Moreover, what has been written, as bearing upon the subject, has been chiefly negative, so far as relates to this particular question; and much of what has been done is mostly inapplicable—on account of difference of conditions—to the ordinary work of the mechanical engineer. At a recent meeting of the English Institute of Mechanical Engineers a committee was appointed to make special research as to what has been done in this direction. We copy the following paragraphs from the report of that committee:

A difference has long been recognized between what has been called static friction, or the friction of rest, and dynamic friction, or the friction of motion, the co-efficient in the former case being, in many instances, much higher than in the latter. The recent experiments of Prof. Fleeming Jenkin in conuection with this matter, although made at the opposite end of the scale of velocities to that about which the committee is now chiefly concerned, have great interest in connection with the general question of velocity and friction. By experimenting at extremely low velocities, he has shown that in certain cases, where there is a very marked difference between the two co-efficients mentioned, the co-efficient of friction decreases gradually as the velocity increases, between speeds of 0.012 and 0.6 feet per minute; and his experiments indicate a probability of a continuous rather than a sudden change in the value of the co-efficient between the conditions of rest and motion. In cases where there is little or no differences between the co-efficient of rest and motion, no difference was found at the velocities between which he experimented. His experiments were made with a very small steel spindle of 0.1 inch diameter only, resting in rectangular V notches, the pressure being constant, and due to the weight (86 pounds) of a disc carried by the spindle, and revolving with it.

Prof. A. S. Kimball has also made a number of experiments upon the question of velocity and friction. At common, but somewhat slow speeds, he finds the friction between pieces of pine wood to decrease rapidly as the speed increases. With a wrought-iron shaft of one inch diameter, working in a cast-iron bearing well oiled, an increase of velocity of rubbing from 6 to 110 feet per minute caused the co-efficient of friction to fall to 0.3 of its first value. The pressure in this case was about 67 pounds per square inch. Other experiments on lubricated journals at smaller pressures gave a diminution of the co-efficient from 0.15 to 0.05, as the velocities increased from 1 to 100 feet per minute. At such low speeds as from 0.59 to 2.2 feet per minute, a similar decrease was found; while at the still lower velocities of from 0.002 to 0.01 feet per minute, the friction *increased* with the velocity.

Prof. R. H. Thurston has carried out a number of experiments to determine the effect of changes, not only in velocity, but also in pressure and temperature, upon the fractional resistance in lubricated bearings. His conclusions are that the co efficient at first decreases, but after a certain point increases with the velocity, the point of change varying with the pressure and the temperature. At a pressure, for instance, of 100 pounds per square inch and a temperature of 150° F., the minimum value of the co-efficient is reached at a speed lying between 100 and 250 feet per minute; while at the same pressure, but at a much lower temperature (apparently) the value of the co-efficient increases continuously from 30 feet per minute, the lowest velocity tried, up to 1,200 feet per minute. As the general result of his work, Prof. Thurston has come to the conclusion that for a cool and well-lubricated bearing the co-efficient of friction increases with the velocity, and approximately as its fifth root, at all speeds exceeding 100 feet per minute. It is much to be regretted that Prof. Thurston has published no information about his very important experiments, in this part of the subject, except a few table of epitomized results. Neither the sizes of the journals tested, the number of tests made, nor any particulars as to the variation of the experiments among themselves are given, and very few details as to the way in which they were carried out. Until this information is made accessible (as it is to be hoped it will be made) it is not easy to estimate the degree of importance to be attached to these results.

A NEW METAL FOR JOINTS.—According to the *Colliery Guardian*, Messrs. J. B. Spence & Co., of London, Manchester and Glasgow, have invented what they term "a new metal for joints"—a thing that has long been felt to be needed, especially by gas and water companies, and others who have much to do with jointings, particularly iron to stone or wood; a metal which is to supersede lead for jointing water or gas pipes and filling up holes in defective castings. It is run into the joints in the same way as lead, but without caulking, it will produce an hermetically-sealed joint, and the patentee claims for his invention the advantage of the metal over lead, inasmuch as it will stand a pressure of 500 to 800 pounds; that a joint is made in about one-fifth of the time usually employed; that it is not affected by aqueous or atmospheric action; it can be used over and over again without losing any of its qualities; and that it is free from poisonous substances; and, not being acted upon by water alkalies or acids, may also be used for lining cisterns for domestic and other purposes. It can also be used as a substitute for lead in its application to industrial and artistic purposes. There is certainly one very great advantage which this metal has over lead, namely, its cheapness, which the patentee states is one-third of that of lead—an advantage which will certainly recommend itself to economists. We are not advised as to what this substance is.

INTERESTING FACTS.—Prof. Gore, in 1869, and subsequently Prof. Barrett, in 1873, drew attention to certain anomalies that occurred in the expansion and contraction of iron wire; and in 1877 Prof. Norris published the result of his experiments on the same subject, which appear to confirm Chernoff's theory in a remarkable manner. In cooling a strained iron wire from redness, it was found that the contraction due to cooling was, at a certain point and for a limited period, changed into action of elongation. In good iron wire this irregularity could not be detected, but in hard wire and steel it was very apparent. The wire has to be raised to a very high temperature before the temporary elongation during cooling can be seen; and it does not take place if the wire is heated only just beyond the temperature at which it occurs. Prof. Norris' researches have led him to the conclusion that in steel and in iron containing free carbon, there is a contraction of shortening which is excited by heat and which proceeds simultaneously with the dynamical expansion and masks its true amount. This is divisible into high and low temperature contraction.

LUBRICANTS.—The choice of a lubricant is frequently ill made. Common kerosene oil is too often injudiciously used in place of a thicker or more bland oil, because the heat produced by friction rapidly vaporizes the oil and leaves the journal dry. Crude petroleum for the same reason is fitted only for very slowly-revolving journals, such as water wheels. For very heavy machinery, or for gearing, tallow and black lead rubbed up together is the best lubricant, and is also the best for wagon and carriage axles during the hot weather. For light-running machinery, sperm oil is the best; good olive oil that has not become rancid and acid, is perhaps the second best, and for winter use lard oil is excellent, but is rather too drying to be a first-class lubricant. Castor oil is better for axles in the winter, and black lead with it is a help at any time.

SCIENTIFIC PROGRESS.

An Immense Meridian Arc.

The Geodetic Junction of Europe and Africa Effected.

On examining a map of Europe and considering the numerous geodetic operations that have covered the British islands, France, Spain and Algeria, one readily sees how desirable it is to connect the system of triangles into one whole, reaching from the northernmost of the Shetlands (61° latitude) to the great desert of Africa (34° latitude.) It is gratifying to know that Spain and Algeria have been lately brought into geodetic connection, so that science now possesses a meridian arc of 27°, the greatest hitherto measure on the earth, and projected astronomically on the heavens. This important work was undertaken by the governments of France and Spain, and has been carried out under the direction of Gen. Ibanez and M. Perrier. Preparations for it have been going on for several years. Four mountain hights were at length selected for signaling operations, viz.: Mulhacen and Tetica in Spain, (the former being the highest in that country), and Filhaoussen and M'Sabiha, between Oran and the frontier of Morocco.

It was decided not to trust alone to solar signals, but also to employ the electric light at night, and the event fully justified this resolve, for the solar signals totally failed, being seen neither in Spain nor Algeria. The difficultiss of the enterprise, then, will be obvious on consideration, for to produce the electric light with sufficient intensity it was necessary to have recourse to electro-magnetic apparatus driven by steam engines, and the problem was that of hauling up Gramme machines, engines of six-horse power and various instruments to summits of 1,000 to 3,550 meters high, making roads on these desert mountains, organizing supplies of water and fuel, and finally providing accommodation and sustenance at each station for 30 to 100 men and 15 or 20 beasts.

The time open for operations was short, between the intense heat and early snows. On August 20th, all were at their posts—Colonel Barraquer on Mulhacen, Major Lopez on Tetica, Captain Bassot on Filhaoussen and M. Perrier on M'Sabiha. But in vain were solar signals sent by day, and electric by night; the vapors from the Mediterranean proved impervious to the beams. At length, however, on September 9th, after 20 days of feverish expectation, M. Perrier perceived the electric light of Tetica, visible sometimes to the naked eye, like a round reddish disk, as bright as *a* in Arcturus, which appeared near the horizon. On the 10th he perceived the electric light of Mulhacen. The Spaniards also perceived the French signals and a period of definite observation was entered upon extending from September 9th to October 18th. The geodetic junction of the two continents was at length realized. The numerical results arrived at with regard to those four immense triangles of some 70 leagues length of side are given in a communication by M. Ferrier to the French Academy, and are shown to have satisfactory accuracy.

Scientific Farming Practical.

Mr. Buckmaster, before a well-attended meeting of farmers, held at Tadley, in England, the other day, to consider a scheme for teaching the science of farming, said that there was no opinion more deeply ingrained in the mind of the English farmer than the belief that there was some antagonism between science and practice. Some even went so far as to say that the two are incompatible. The farmer who drains his land or tries a new manure, or a new machine, or a new crop, calls himself a practical man; he despises all experiment, and laughs at the teaching of scientific men. He is not conscious that when he is thinking over new plans and adopting new methods of cultivation he may be illustrating in his daily work a series of chemical and physiological experiments of extreme complexity and importance. Men of the highest order of intellect, and whose researches were the most original, have been practical men. Practice and theory are but phases of the same form of thought. The practical farmer, if he ever permits his mind to rise above the traditions and empirical rules of his forefathers, and asks, "Could not that have been done in a better and more perfect way; would not this be an improvement?" becomes a theorist, and when he tries to realize these conceptions, he becomes a practical man.

Theory and practice are inseparable in every art, however much men may seek to disunite them. The most practical man is often the most theoretical. Every operation is with him a theory. He recognizes no change; he will admit of no trial or experiment, because that would be an acknowledgment of science. Every science is built up of principles, and these principles carried into work are called practice. There is the science of astronomy and the art of navigation; the science of geometry and the art of land measuring; the science of mechanics and the art of making machinery; the science of chemistry and the art of agriculture. Almost every science is the basis of a cognate art. The most obvious and natural way of arriving at a real knowledge of the art of agriculture would be to know something of those principles on which the art is based, are being nothing more than the application of principles previously acquired. A farmer who is able to unite a perfect mastery of principles with a knowledge of practical details is an educated and scientific farmer. It might reasonably be inferred that the shortest and easiest method of learning any industrial art, and the surest guide to new discoveries in the art, would be a knowledge of those fundamental principles upon which the art was based. No amount of practical skill and experience could ever replace the want of scientific knowledge in farming.

THE AIR IN SEA WATER.—It is only in recent years, and through the well-equipped expeditions that have been engaged in exploring seas, that the question as to the amount and composition of the air in water has been systematically treated. Important researches of the kind were carried out by Herr Jacobsen on the *Pomerania*, in the Baltic and North sea; one result of these being that the proportion of oxygen in the air of surface water was found pretty constant between 33.64% and 34.14%. Again, Mr. Buchanan, of the *Challenger* expedition, found it to vary between 33% and 35%, the largest proportion being in the neighborhood of the South Polar circle, and the least in that of the trade-winds. A new study of the question by Herr Svendsen and Herr Tornoe, in connection with Norwegian expeditions to the sea between Norway, the Faroe islands, Iceland, Jan Mayen and Spitzbergen, has recently appeared. In some respects former methods of procuring the water and of analysis were improved on, and laboratory experiments were made as to the absorption of air by sea water. These observers got higher numbers in the surface proportion of oxygen than were obtained for the North sea; thus, south of 70° latitude the average was 34.96%; and between 70°, and 80°, 35.64%, instead of 33.93%. This corresponds, however, with what Mr. Buchanan met with in the latitude of the Antarctic circle, viz: 35%. It appeared, further, that the oxygen in the surface water was always considerably greater than as found by laboratory experiment; so that, apparently, it does not depend alone on pressure and temperature, but also on some still unknown causes.

A NEW WAY OF STUDYING SOUNDS.—The London *Times* reports that a new and simple way of producing colored rings, which seems capable of some interesting applications, has been recently brought to public notice by M. Guebhard. A saucer filled with not very pure mercury is all the apparatus required. Then clear off with a piece of card or paper the thin pellicle of oxide and dust, breathe on the bright surface, and a magnificent system of colored rings is given by the film of condensed moisture then formed. Instead of four or five "irises" described by Newton, six or seven can be well made out, and the thickness of the film increasing from the border inwards, the order of hues is reversed. Still better effects can be got by dropping volatile substances (as petroleum oil) on the mercury surface, instead of breathing on it; but the most remarkable results are had with the collodion. Diluted with ether, this gives pellicles on the mercury, which may be detached (after their thickness and colors have been regulated at will) and transferred to paper. M. Guebhard has utilized these effects in study of the sounds of the voice. Vowel sounds uttered above the moistened mercury surface produce characteristic ring figures which throw new light on the nature of the vibrations involved. The vibratory state, indeed, for vowel sounds, appears to be often very complex, the figures presenting groups of several ring systems, indicating several centers of percussion.

RECENT PROGRESS IN MICROSCOPY.—At the second annual reception of the New York Microscopical Society, February 7th, the retiring President, Mr. J. D. Hyatt, gave a brief account of the present condition, prospects and recent progress of microscopy. After referring to the success of the Continental makers of objectives years ago in attaining a certain mediocrity in the manufacture of lenses, Mr. Hyatt said that of late they have been altogether distanced in optical science by English and American opticians. The principal feature of advance during the past year was the celebrated Zeiss oil-immersion objective. The greatest success in micrometer manufacture of recent years was credited to Prof. Rogers, of Cambridge, who, by means of a complicated instrument constructed by himself, has been enabled to lay off lines upon a glass slide at distances apart of one one-hundredth and one one-thousandth of an inch with such accuracy that the deviation is less than one one-millionth of an inch.

PENETRATIVE POWER OF THE ELECTRIC LIGHT. Some time ago we mentioned an experiment with the Maxim light made at Saratoga, N. Y., to test the distance at which the electric light would illuminate a given spot, and it was found that a concentrated beam carried seven miles furnished enough light to read by. A more crucial test of the great penetrating power of the electric light is furnished by the experiments of the officers of the French-Algerian Triangulation Service, who recently saw the electric light from a distance of more than 164 miles. This observation is proof, if proof were wanted, of the great value of the light for maritime purposes, when it is exhibited from sufficiently elevated positions.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 19.	Week Ending Feb. 26.	Week Ending Mar. 4.	Week Ending Mar. 11
Alpha	9 7½	8½ 7	9 7¾	8¾ 8
Aita	4.30 3.70	3.90 3.05	4.20 3¾	3¾ 3.90
Andes	90c 75c	90c 70c	80c 60c	75c 50c
Alta				
Arzenta	1.30 1	1.15 90c	75c 60c	95c 60c
Atlantic				
Aurora Tunnel				50c
Baltimore Con	1½ 1	1½ 1	1½ 1¼	1¼ ¾
Belcher	1½ 1	1½ 1	1½ 1¼	1¼ ¾
Belmont	40c 35c	25c 20c	30c 25c	20c
Best & Belcher	9¾ 8½	8¾ 7	10¾ 8¼	10¾ 9¾
Bullion	4.55 3.55	4 3	5 4.10	5¾ 4.55
Bechtel	2.20 2.05	2.05 2	2 2.05	2 2.35 2
Belle Isle	¼ 90c	1.05 90c	1.10 1.0	1¼ 1¼
Bodie	8¾ 8¼	9¾ 8¼	9 8¼	9 8¾
Benton	2.80 2.40	2.45 2	2.45 2¼	2.45 2.20
Bulwer	9 8½	10 8¼	9¼ 8¼	9¼ 8¾
Boyle				
Black Hawk	80c 70c	80c 50c	80c 75c	1¼ 80c
Belvidere	2 1.30	2.70 2¼	4.55 2.65	3.80 2¼
Booker	70c 55c	60c 50c	80c 60c	90c 60c
Caledonia	1.05 75c	85c 60c	1.45 80c	1.40 1.15
California	3.90 3.45	3¼ 3¼	3¾ 3.20	3.65 3.40
Challenge	1¾ 1.60	1¼ —	1.60 1¼	1¼ 1¼
Chollar	6¾ 6	6 5	6¾ 5¼	6¾ 5¾
Conface	7 —	7 6	7 —	7¾ 7
Con Imperial	65c 60c	65c 50c	65c 55c	65c 55c
Con Virginia	3.85 3¼	3¾ 3¼	3.70 3¼	3.70 3¼
Crown Point	4.85 4.40	4.70 3.85	4¼ 4.45	4¼ 3.40
Con Washoe				
Champion	55c 50c	55c 50c	50c 30c	60c 25c
Concordia			50c 50c	45c
Dayton				
DeFrees				
Daney	35c			
Day	60c 40c	60c 45c	55c 50c	45c 40c
Eureka Con	16¾ 15	14¾ 14	14¼ 13¾	15¾ 15
Exchequer	3.40 2.90	3 2.65	3¼ 3	3.60 3
Endowment	35c 30c	25c 15c	20c 15c	20c 15c
Gen Thomas				
Grand Prize	1.30 1¼	1.35 1¼	1.40 1.30	1.40 1¼
Gila			20c	25c
Golden Chariot				
Golden Terra				
Goodshaw	40c 35c	30c 25c	30c 20c	50c 45c
Gould & Curry	5¾ 5¼	5¾ 4¼	5¼ 4.95	6¼ 5
Hale & Norcross	7 5¼	6¾ 5¼	7 5¼	6¾ 5¾
Hillside	1¼ 1	1.10 1	1¼ 1	1.40 1.10
Highboe				
Homestake				
Hussey				
Independence	1.30 1	1.20 85c	90c	1¼ 1¼
Julia	1¼ 1.55	1.60 1¼	1¼ 1.45	1.40 1¼
Justice	1.80 1¼	1.60 1.15	1¼ 1.30	1.55 1¼
Jackson	2.90 2	2 —	2 —	2¼ 2
Joe Scates				
K K Con	4 —	5¼ 4	5 4	4 3
Kentuck	3¾ 3	3¾ 3	3¾ 3	3¾ 3
Kossuth	15c	15c	15c	
Keystone				
Lady Bryan	45c 25c	50c 30c	50c 35c	50c 30c
Lady Wash	85c 70c	70c 55c	80c 65c	75c 65c
Leopard	20c 15c	15c —	15c 10c	10c
Leviathan	30c 20c	20c 15c	15c 10c	15c 10c
Leeds	50c 30c	50c —	60c —	50c
Lee				
May Belle	20c —	20c —	25c 20c	35c 25c
Modoc	45c 40c	45c 40c	40c —	40c
Manhattan	1¾ 1½	1¾ 1.40	1½ —	1.55 1.30
Martin White	1 80c	90c 80c	90c 85c	85c 75c
McClinton	50c 40c	50c 35c	70c 45c	1 65c
Meadow Valley				
Mexican	18 15¼	15¾ 12½	16 14¼	16¾ 14¾
Mides				
Morning Star				
orth Con Virginia				
New York	45c 35c	40c 30c	45c 35c	40c 35c
Northern Belle	17 14¾	16¾ 15	16¾ 15¾	16¾ 16¾
New Coso				
Navajo	35c 20c	30c 25c	30c 25c	30c
Occidental	1.35 1	1.30 1	1.10 1	1.05 90c
Ophir	20 16¾	17¾ 14¾	18 17	18¾ 17¾
Oriental	50c 30c	40c 30c		
Overman	6¾ 5¾	6¾ 5¼	6¾ 6¼	6¾ 5
Panther				
Phenix				2
Phil Sheridan	20c	15c	20c	20c
Potosi	4¼ 3.60	3.70 2	4.85 3.40	4.65 4
Prospect				
Raymond & Ely	80c 70c	80c 60c	1 50c	1 55c
Richer				
Rock Island				
Rye Patch				
Rough & Ready				
Savage	6 5¾	5¾ 4¼	6¾ 5¼	6¼ 5
Seg Belcher		19 15	16 —	17¾ 17
Sierra Nevada	23¾ 21	22¼ 20¾	23¼ 22	23¾ 21¾
Silver Hill	1.35 1	1.30 1.05	80c 1.10	90c 1 75c
Silver King	7¼ 7	7 —	7 —	7 —
Silver Prize				
Succor				
Summit	1.10 1	1.10 1	1¼ 1	1 1¼
Scorpion	3¼ 3	3.05 2.80	3.10 3	3¼ 3
Solid Silver	35c 30c	5c —	10c —	
South Bodie	70c 50c	70c 65c	85c 60c	80c 75c
South Standard	30c 25c	30c 25c	25c 15c	35c 20c
Star	25c —	20c —	25c 20c	20c —
St. Louis				
Syndicate	1.55 1.40	1¼ 1¼	1.45 1.30	1¼ 1¼
Tioga Con	3.10 2¼	2.80 2¼	2¾ 2¼	3 2¼
Tiptop	4.10 4.05	4.55 4¼	5¼ 4.60	5 4¼
Trojan	40c 25c	35c 15c	15c —	15c 10c
Union Con	35¼ 34	33¾ 30	37¼ 32¼	40¼ 36¼
Utah	13¾ 12	11¾ 10¼	12 11	12 10¾
Vermont Con				
Ward	1.65 1.60	1.60 —	1¾ 1.60	2 1¼
Wells Fargo	5c —	5c —	5c —	5c —
Woodville				
White Clond				
Yellow Jacket	9¼ 8¼	6¾ 6¾	9¼ 8¾	9¼ 8¼

Sales at S. F. Stock Exchange.

Friday A. M., Mar. 5.

65	Alta	3.80	
1000	Andes	70@75c	
550	Belcher	12¾@12½	
135	Best & Belcher	10@10¼	
60	Benton	2.40	
1685	Bullion	5@4.80	
80	California	3¾@3.65	
540	Crown Point	4.40@4¼	
50	Con Virginia	3.70	
490	Chollar	6¾@6¾	
430	Caledonia	1.30@1¼	
750	C Dorado	1.45@1.40	
75	Challenge	1.65	
250	Exchequer	3¾@3.40	
100	Essex	1¼	
100	Fairfax	60c	
300	Flowery	20c	
2450	Golden Gate	75c	
250	Gould & Curry	5¾@5¾	
580	Hale & Nor	6¾@6¾	
650	Julia	1.35@1.40	
140	Justice	1.30@1¼	
25	Kentuck	3¾	
700	Leviathan	10@15c	
50	Lady Wash	70c	
100	Mexican	15¾	
500	Mackey	15c	
120	N Bonanza	45@50c	
145	Ophir	17¾@17¾	
30	Overman	6¾	
90	Occidental	1.05@1.10	
300	Phil Sheridan	20c	
595	Potosi	4@4.05	
500	Pioneer	10c	
195	Scorpion	3@3.05	
320	Savage	5	
135	Sierra Nevada	22@22¾	
50	Seg Belcher	17¾	
480	Silver Hill	85c@1	
40	Utah	11¾@12	
100	Union Con	36¼@36¾	
100	Ward	1.70	
800	Wells-Fargo	5c	
490	Yellow Jacket	8¾@9¼	

AFTERNOON SESSION.

650	Addenda	90@85c	
270	Albion	30c	
380	Argenta	85@95c	
495	Belle Isle	1¼	
450	Boston	1¼@1.30	
1250	Belcher	12¾@12¾	
1095	Booker	80@85c	
645	Belvidere	3¼@3.90	
310	Bulwer	9¼@9	
1160	Black Hawk	90c@1.15	
40	Bodie	8¾	
600	Benton	2.30@2.35	
600	Champion	60@55c	
1250	Concordia	50@45c	
110	C Pacific	4	
800	Day	45@40c	
600	Dudley	75@70c	
975	D Standard	1.20@1¼	
375	E M Diablo	12@1 65	
10	Eureka Con	15	
2500	Endowment	20c	
1355	Grand Prize	1¼	
300	Goodshaw	45c	
100	Gila	25c	
120	Hillside	1.10@1.15	
60	Independence	1.15	
70	Jackson	2	
700	Jupiter	2.30@2.85	
20	K K Con	5	
800	Leopard	10c	
745	Mono	3¾@4	
380	May Belle	25@35c	
890	McClinton	90@85c	
100	Manhattan	1¾	
100	Metallic	1.80	
560	Mt Potosi	4@3.95	
335	N Noonday	3.90@4	
605	Oro	2.10@1.90	
2350	Orient	10@5c	
420	Paradise	1.10@1.20	
1450	Queen Bee	65c	
200	Raymond & E	1	
100	Rustler	25c	
470	Syndicate	1¼	
1250	S Bulwer	1.90@2	
500	S Standard	25@30c	
100	S Bodie	80c	
340	Summit	1.90@2	
725	Tioga	3	
315	Tiptop	5	
1800	University	30c@40c	
120	Wales	3	

Saturday A. M., Mar. 6.

170	Alta	3.80@3¾	
130	Andes	70@75c	
920	Argenta	85c@90c	
400	Albion	30c@35c	
330	Addenda	75@80c	
65	Best & Belcher	10¾	
1290	Belcher	12¾@11¾	
350	Bullion	4.95	
10	Benton	2.45	
16s	Bodie	8¾@8¼	
70	Bechtel	2¼@2.30	
345	Black Hawk	1¼	
750	Belvidere	3.80@3.55	
515	Booker	85c@90c	
100	Bulwer	9¼	
100	Boston	1.30	
230	California	3.60@3.55	
110	Con Virginia	3.70@3.65	
360	Chollar	5¾@5¾	
2260	Crown Point	4.45@4.35	
400	Con Imperial	65c@60c	
70	Challenge	1¾	
175	Caledonia	1¼@1.40	
450	Con Dorado	1.45	
95	C Pacific	4@3¾	
60	Chamption	6@5¾	
400	Concordia	50c	
300	Day	45@40c	
650	Dudley	1¼@1	
250	D Standard	1.15@1.10	
230	Exchequer	3.40	
60	Eureka Con	15	
550	Endowment	15@20c	
270	E M Diablo	1¼	
200	Flowery	20c	
850	Goodshaw	50@45c	
50	Golden Gate	75@80c	
30	Glory	1¼@1	
150	Gould & Curry	5¾@5¾	
10	Giant & O A	5	
590	H & Norcross	6¾@6¼	
100	Hillside	1.40	
360	Hale & Norcross	7@6¾	
85	Julia	1.45	
900	Jupiter	2.70@2.60	
180	Lady Wash	70@75c	
20	Lady Bryan	30c	
400	Leviathan	15c	
563	Lichtan	16¼@16	
50	Mackey	15c	
130	Manhattan	1.30	
100	Mt Potosi	3.90@3.80	
150	Metallic	2	
255	McClinton	80@85c	
80	Monroe	1¼	
650	May Belle	35@25c	
125	Maumoth	2	
400	New York	35@40c	
150	N Bonanza	45@50c	
400	Northern Belle	16¼@16¾	
100	N Belle Is	25c	
150	Noonday	3.90	
115	N Noonday	3.90@4	
700	Orient	10c	
350	Ophir	18¾@18¾	
80	Overman	6¼@6¾	
315	Occidental	1.05@1	
850	Oro	1.80@1.85	
400	Potosi	4.10@4	
100	Paradise	60c	
1970	Queen Bee	60@55c	
10	Savage	5¼	
10	Seg Belcher	16¾	
850	Sierra Nevada	23¼@23¼	
215	Silver Hill	95@90c	
310	Scorpion	3.15@3¼	
150	S Bodie	80c	
570	Succor	20c	
500	S Standard	25c	
520	Syndicate	1¼@1.70	
200	S Bulwer	1.80	
200	Silver King	7	
50	Tioga Con	3	
500	Tiptop	4.45	
220	Utah	11¼@11	
500	Union Con	40@40¼	
1250	University	20@25c	
150	Ward	1.90@2	
30	Wales	3	
115	Yellow Jacket	9¼	

Monday A. M., Mar. 8.

50	Alta	3.90	
150	Andes	70c	
90	Best & Belcher	10¾	
1965	Belcher	11¾@11¼	
255	Bullion	5¼@5¾	
50	Benton	2.40	
200	Con Virginia	3.70	
415	Chollar	6¾@6¾	
330	Crown Point	4.40@4.30	
230	California	3.60@3.65	
50	Confidence	7	
110	Caledonia	1.40	
710	C Dorado	1¼@1.45	
125	Exchequer	3¼@3.60	
100	Essex	1¼	
200	Flowery	20c	
330	Gould & Curry	5¾@5¾	
450	Golden Gate	75c@80c	
200	Lady Bryan	30c	
200	Leviathan	15c	
235	Mexican	16¼@16¾	
1450	Mackey	15c	
230	New York	40@35c	
100	N Bonanza	45@50c	
10	Opnar	1¾	
70	Overman	6¾@6¾	
150	Occidental	1	
355	Potosi	4.65@4.60	
200	Phil Sheridan	20c	
115	Savage	5¼	
345	Sierra Nevada	23¼@23¼	
290	Silver Hill	95c@1	
130	Scorpion	3¼@3.40	
100	Trojan	15c	
340	Union Con	39¼@39¾	
100	Utah	11¾	
30	Ward	2	
205	Yellow Jacket	9¼@9¾	

AFTERNOON SESSION.

550	Argenta	85@80c	
930	Albion	30c	
1250	Alta	3.90@3¾	
505	Addenda	70@60c	
40	Bodie	9	
800	Boston	1.30@1¼	
400	Bechtel	2¼	
100	Booker	60c	
510	Belvidere	3.85@3.60	
260	Bulwer	9@9¼	
540	Black Hawk	1.20	
25	C Pacific	3¾	
1050	Concordia	50c	
300	Champion	40@35c	
870	Day	40c	
100	Dudley	90c@1	
1915	D Standard	1¼@1.20	
200	Endowment	15c	
490	E M Diablo	1¼	
90	Gila	20c	
1015	Grand Prize	1¼@1.35	
435	Goodshaw	50@45c	
700	Hillside	1.10@1¼	
240	Independence	1¼@1.20	
1330	Jupiter	2.40@2.85	
200	Leopard	10c	
200	Leeds	50c	
250	Metallic	2¼	
40	Modoc	40c	
100	Mt Potosi	3.90	
100	Mt White	80c	
2400	Mammoth	2	
1100	McClinton	95c@1	
400	May Belle	25c	
140	Mono	8¼@8¾	
550	Northern Belle	16¾	
100	N Belle Is	40c	
10	Noonday	3.80	
30	N Noonday	3¾	
600	Oro	1.65@1¾	
200	Orient	10c	
400	Paradise	60@55c	
345	Queen Bee	55@45c	
90	Raymond & Ely	45c	
40	Tioga Con	2¼	
150	Tiptop	4¼	
1800	Real del Monte	1¼	
300	Star	20c	
950	South Standard	25@35c	
100	Silver King	7	
550	S Bulwer	1.90@1.80	
225	Summit	1¼	
150	Syndicate	1.10	
500	Tiptop	4¼	
40	Tioga Con	3	
200	University	20c	
120	Wales	3@3.05	

Tuesday A. M., Mar. 9.

30	Alpha	8¾	
150	Andes	70c	
75	Alta	3¾@3.60	
490	Bullion	5	
580	Belcher	10@9¾	
100	Benton	2.20@2¼	
10	Best & Belcher	10¾	
200	Confidence	7	
2300	Con Imperial	60@65c	
85	Con Virginia	3.65@3.70	
450	Chollar	5¾@5¾	
240	Crown Point	3.60@3.55	
130	Caledonia	1.15@1.20	
125	Challenge	1¼	
250	Con Dorado	1¼	
50	Essex	1¼	
300	Exchequer	3¼@3.20	
200	Flowery	20c	
450	Golden Gate	80@35c	
150	Gould & Curry	5¾	
50	H & Norcross	6¾	
405	Julia	1¼@1.20	
320	Justice	1.15	
185	Kentuck	3¼	
250	L Wash	10@65c	
300	Leviathan	15c	
150	Mexican	15c	
220	Mackey	15c	
410	N Bonanza	50@45c	
290	New York	40@35c	
40	Occidental	1	
135	Ophir	17¾	
10	Overman	5¾	
200	Pioneer	15c	
50	Potosi	4.30	
405	Sierra Nevada	22@21¾	
340	Savage	5¼	
275	Silver Hill	90c	
170	Scorpion	3.20	
50	Succor	20c	
415	Union Con	36¾@37	
100	Ward	1.65	
35	Yellow Jacket	8¾@8¼	

AFTERNOON SESSION.

1210	Argenta	75@65c	
415	Addenda	60@65c	
600	Atlas	5c	
500	Aurora	50c	
100	Albion	25c	
250	Belding	1¼@1.20	
25	Bodie	8¾	
100	Bechtel	2.30	
1160	Black Hawk	80c@1	
450	Booker	65c@70c	
50	Boston	1.30	
850	Belvidere	3¤2¼	
450	Champion	40c@50c	
50	Caledonia (B H)	2.60	
600	Concordia	55c@60c	
290	C Pacific	3¼	
1000	D Standard	1.10	
750	Day	50c	
405	Dudley	85c@75c	
230	Eureka Con	15¾@16	
600	Endowment	15c	
330	E M Diablo	1¼	
1550	Grand Prize	1.30	
2890	Goodshaw	50@45c	
50	Gila	25c	
500	Holmes	20@1	
30	Hillside	1.35	
1110	Inexpendence	1¼@1.15	
250	Jupiter	2.80	
320	Leopard	10c	
100	Lee	2	
50	Manhattan	1¼@1.55	
320	Mono	8@7¾	
525	McClinton	90@95c	
130	Mammoth	2@1.95	
100	Martin White	85c	
700	May Belle	25@30c	
475	Mt Potosa	4	
200	Noonday	3¾	
1125	N Belle Is	40c	
70	Northern Belle	16¾	
70	N Noonday	3¾	
1200	Orient	10c	
400	Oro	1.70@1¾	
400	Paradise	60c	
350	Queen Bee	55c	
100	S Bodie	75c	
300	S Bulwer	1.85	
1000	Summit	1¼	
400	South Standard	25@30c	
100	Summit	1¼@1.40	
100	Star	20c	
80	Tioga Con	2.95	
200	Tuscarora	25c	
80	Tiptop	4¼@4.65	
650	University	20c	
420	Wales	3.10@3¼	

Wed'sday A.M., Mar. 10.

40	Alpha	8¾	
190	Alta	3¾@3.60	
435	Andes	65@60c	
130	Bullion	4¾@4.55	
295	Belcher	10@9¾	
155	Best & Belcher	10	
190	Benton	2¼@2.20	
60	Caledonia	1.20	
250	California	3¾@3.55	
450	Con Virginia	3.65@3.60	
250	Chollar	5¾@5¾	
50	Confidence	7	
350	Con Imperial	60c	
350	C Dorado	1¼@1.45	
845	Crown Point	3 80@3¾	
100	Exchequer	3¼@3.05	
100	Essex	1¼	
380	Gould & Curry	5¾@5¾	
1150	Golden Gate	70@75c	
235	Julia	1¼@1.20	
200	Justice	1.15@1.20	
70	Kentuck	3¼	
400	Leviathan	15@10c	
405	L Bryan	45@50c	
170	Mexican	15	
30	Mackey	15c	
200	N Bonanza	45c	
30	Overman	5¾	
100	Occidental	90c	
70	Ophir	18	
400	Pioneer	15c	
50	Potosi	4.40	
115	Scorpion	3@3.05	
185	Sierra Nevada	21¼@21¾	
270	Silver Hill	80c	
30	Savage	5¼@5¾	
260	Union Con	37¼	
100	Utah	10¾	
110	Yellow Jacket	8¾@8¾	

AFTERNOON SESSION.

600	Argenta	65@60c	
1030	Addenda	60@65c	
400	Altas	5c	
100	Albion	25c	
100	Belding	1.10	
140	Booker	75@70c	
200	Boston	1.30@1¼	
275	Belvidere	3.80@3¾	
30	Bodie	8¼	
175	Bechtel	2	
30	Bulwer	8¾@8¾	
150	Belle Isle	1¼@1.30	
700	Champion	40@50c	
200	Concordia	50c	
150	C Pacific	3¾	
560	Dudley	75@70c	
2000	Day	50@60c	
1350	D Standard	1@1.10	
150	E M Diablo	1¼	
125	Eureka Con	15¾	
250	Endowment	15c	

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt. Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	14	25	Feb 26	Apr 1 Apr 20	B Burris 309 Montgomery st
Belcher S M Co	Nevada	21	1 00	Jan 29	Mar 3 Mar 25	J Crockett 203 Bush st
Belle Isle M Co	Nevada	1	30	Jan 27	Mar 3 Mar 25	E M Hall 327 Pine st
Belmont M Co	Nevada	23	20	Mar 3	Apr 8 May 5	J W Pew 310 Pine st
Belvidere M Co	California	6	50	Mar 4	Apr 6 May 1	C V D Hubbard 203 Bush st
Best & Belcher M Co	Nevada	17	1 00	Jan 29	Mar 4 Mar 24	W Willis 309 Montgomery st
Bodie Tunnel & M Co	California	4	20	Feb 3	Mar 21 Apr 28	A F Main 309 California st
Bullion M Co	Nevada	13	50	Jan 26	Feb 28 Mar 17	J M Brazil 328 Montgomery st
Caledonia S M Co	Nevada	30	50	Jan 31	Mar 6 Mar 26	R Wegener 414 California st
Champion M Co	California	—	05	Jan 20	Mar 1 Apr 1	G C Hurlbut 525 Commercial st
Chollar M Co	Nevada	3	50	Feb 5	Mar 11 Mar 31	W E Dean 203 Bush st
Champion M Co	California	6	50	Feb 28	Apr 5 Apr 27	J Crockett 203 Bush st
Day S M Co	Nevada	5	05	Mar 2	Apr 6 May 3	J F Pew 310 Pine st
Dudley M Co	California	7	25	Feb 4	Mar 8 Apr 5	E C Masten 309 Montgomery st
El Tesoro	California	8	25	Dec 15	Mar 15 Mar 31	W H Chickering 214 Sansome st
Endowment M Co	Nevada	4	25	Mar 1	Apr 5 Apr 26	E M Hall 327 Pine st
Hillside M & M Co	Nevada	2	30	Feb 4	Mar 8 Apr 5	F Frankenthal 330 Pine st
Indian Queen M Co	Nevada	3	15	Feb 11	Mar 20 Apr 12	G Adams 431 California st
Julia Con M Co	Nevada	1	50	Mar 3	Apr 7 Apr 26	H A Charles 419 California st
Justice M Co	Nevada	31	50	Feb 9	Mar 15 Apr 5	A E Kelly 419 California st
Leviathan M Co	Nevada	10	25	Feb 17	Mar 20 Apr 10	F A Frisius 330 Pine st
Mammoth M Co	California	4	1 00	Feb 18	Mar 26 Apr 21	A W Rose 302 Montgomery st
McClinton M Co	California	5	25	Feb 6	Mar 12 Apr 2	W H Leut 309 Montgomery st
Metallic M Co			25	Feb 9	Mar 15 Apr 5	309 Montgomery st
New York M Co	Nevada	21	5	Jan 26	Feb 28 Mar 20	D L Thomas 303 Bush st
North Belle Isle M Co	Nevada	2	15	Feb 5	Mar 10 Mar 31	E M Hall 327 Pine st
Oriental Con G & S M Co	California	6	50	Mar 3	Apr 3 Apr 17	H C Hinman 411 California st
Potosi M Co	Nevada	3	50	Feb 5	Mar 11 Apr 1	W E Dean 203 Bush st
Raymond & Ely S M Co	Nevada	13	25	Jan 23	Mar 1 Mar 24	W L Elliott 328 Montgomery st
Real Del Monte M Co	Nevada	10	50	Mar 4	Apr 10 May 8	C V Hubbard 203 Bush st
Savage M Co	Nevada	41	50	Feb 4	Mar 8 Mar 27	E B Holmes 309 Montgomery st
Sierra Nevada M Co	Nevada	62	2 00	Mar 8	Apr 10 Apr 28	E L Parker 309 Montgomery st
Soutb Bulwer M Co	California	6	25	Jan 20	Feb 24 Mar 17	W Stuart 320 Sansome st
Telfair M Co	Arizona	2	02	Feb 5	Mar 13 Apr 3	J Pentecost 702 Market st
Tellurium G & S M Co	California	21	10	Feb 24	Mar 25 Apr 20	J M Litchfield 420 California st
Utah S M Co	Nevada	23	2 00	Mar 3	Apr 28 May 20	G C Pratt 309 Montgomery st
Yellow Jacket S M Co	Nevada	36	1 00	Feb 14	Mar 29 Apr 28	M Otey 203 Bush st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona P & M Co	Arizona	1	05	Feb 13	Apr 5 Apr 27	C E Travers 402 Montgomery st
Atlanta M Co	Utah	1	05	Nov 23	Jan 9 Apr 10	A F McGrew 420 Montgomery st
Albion M Co		1	10	Jan 15	Feb 27 Mar 26	— 7 Stock Exchange
Arizona Concentration Co	Arizona	1	10	Feb 9	Mar 17 Apr 5	C E Travers 402 Montgomery st
Cataract and Wide West Grav M Co	Cal	2	25	Feb 2	Mar 2 Mar 22	Wm B Lake 264 Kearny st
Equator M Co	Nevada	2	45	Feb 16	Mar 22 Apr 12	W Willis 309 Montgomery st
Esta Buena Con S M Co	California	6	20	Feb 21	Mar 27 Apr 27	R N Brooks 509 Sacramento st
Florida Hill M Co	California	2	50	Feb 5	Apr 7 May 4	R Wegener 414 California st
Gover & M Co	California	41	10	Mar 8	Apr 12 May 3	W O Wilson 402 Front st
Jackson M Co	Nevada	11	1 00	Feb 10	Mar 16 Apr 5	C N Shaw 408 California st
Jupiter M Co	California	7	40	Jan 23	Feb 23 Mar 19	E C Masten 309 Montgomery st
Lady Emma G M Co	California	1	10	Jan 13	Feb 20 Mar 20	F R Bunker 606 Montgomery st
Last Chance M Co	California	1	05	Feb 28	Apr 10 May 3	T A White 3 Safe Deposit build'g
Leeds S M Co		1	10	Jan 17	Mar 3 Mar 31	— 7 Stock Ex
Mayflower Grav M Co	California	7	10	Jan 19	Feb 23 Mar 16	J Morizio 328 Montgomery st
Mineral Fork M & S Co	Utah	2	08	Feb 21	Apr 3 Apr 24	S Purdy 331 Montgomery st
Oro M Co	California	4	25	Feb 18	Mar 26 Apr 21

75	Gould & Curry	84	
150	Justice	11@1.15	
200	Julia	1.20@1.16	
90	McClinton	90c	
50	Mexican	15@15	
40	Potosi	41	
900	Summit	1½@1.20	
50	Silver Hill	85c	
20	Savage	54	
40	Scorpion	3	
10	Union Con	37	
25	Yellow Jacket	8½	

California Board—Latest Sales.

Wednesday A. M., Mar. 10.			
50	Ætna	6c	
750	Atlanta	7c	
40	Alta	3.60	
200	Andes	70c	
200	Argenta	70@65c	
95	Belcher	10@10½	
20	Best & Belcher	10@10½	
25	Black Hiller	85c	
85	Bullion	4 80	
100	Caledonia	1.20	
25	California	3.60	
30	Con Virginia	3.70	
200	Con Imperial	62½	
120	Crown Point	3.95@3.85	
140	Exchequer	31	
200	Golden Gate (Bi)	67½c	
200	Goodshaw	48c	
30	Gould & Curry	5½@5⅝	
100	Julia	1½	
140	Justice	1.15	
100	Kossuth	10c	
100	Lady Wash	70c	
100	Leviathan	12½c	
30	Mexican	15½@15¾	
200	N Sierra Nevada	6c	
40	N Noonday	31	
30	Ophir	18@18½	
4300	Orient	9@8c	
30	Sierra Nevada	22@21½	
150	Silver Hill	85@87½c	
150	South Bodie	80@79c	
100	Trojan	12½c	
20	Union	37½@37¾	
65	Ward	1.90@1¾	
100	W Comstock	12½c	
100	Wells-Fargo	3c	
10	Yellow Jacket	8½	
	AFTERNOON SESSION.		
25	Alta	34	
101	Andes	67½c	
120	Argenta	67½c	
80	Bodie Q	35@40c	
20	Benton	2½	
45	Belcher	9½@9	
20	Best & Belcher	10	
40	Black Hawk	75c	
10	Bullion	4.70	
100	Caledonia	1.20	
40	California	3.60	
20	Chollar	34	
30	Con Virginia	3.65	
10½	Con Imperial	66c	
50	Crown Point	3.85@3¾	
300	Enterprise	11@11.85	
20	Exchequer	3.20@31	
100	Goodshaw	45c	
30	Gould & Curry	5½@5.20	
30	Julia	1.20	
200	Justice	1.15@1.20	
100	Kossuth	14c	
10	Mono	7½	
100	N Sierra Nev	7c	
30	Ophir	17½@17¾	
200	Orient	8c	
10	Savage	5½	
30	Sierra Nevada	22½@21½	
100	Silver Hill	90c	
10	Yellow Jacket	8½	

Mining Share Market.

Stock operators appear to deem it moro prudent to await botb the adjournment of the present Legislature and the decision of the higher courts upon points of legal status as regards mining and stock transactions. There is so mnch nncertainty as to what is the law, and what is not constitutionally legal, that our clephants of the stock boards dare not venture upon tbe frail structure wbich sbould bridge over tbe gulf hetween inertia and activity. In the meantime they are manipulating for a tithe of their needed bread and bntter, which they find in very thin slices and very lightly spread. The fluctuations in prices have not been morc than sufficient to cover the commissions for selling, in some oases not even sufficient for that.

At tbe annual meeting of the Hale & Norcross mining company, the receipts were announced as $346,067.74 and the disbursements, less cash on hand, as $289,475.26. Of the receipts $319,276 wore from tbe three assessments levied during the year, but we see no mention of anything from any ore. The disbursement for labor and salaries amounted to $110,858, so the mine did some good in that line if it didn't pay any profits to stockholders.

At tbe annnal meeting of tbe Potosi mining company, the receipts as announced were $118,-$12 and tbe disbursements $149,156, leaving an over-draft of over $30,000.

Bullion Shipments.*

Since our last issue, we have noticed tbe following bullion shipments :

Alexander, Feb. 23, $3,532.65; Feb. 25, $2,-147.23; Feh. 27, $2,795.96; Standard Con., for February, $84.579.26; Mar. 1, $22,189.98; Bodie Con., for February, $27,743.86; Mar. 1, $6,-230.20; N. and S. Neonday, for Febrnary, $18,-796.30; Richmond, Mar. 2, $16,692.95; Mar. 6, $19,178.11; Eureka Con., Mar. 2, 2 days, 74,404 lbs. ; Mar. 3, 29,460 lbs. ; Mar. 5, 30,640 lbs. ; Wells, Fargo & Co., at Eureka, Mar. 2, $2,100; Mar. 3, $1,800; Mar. 5, $1,000; McCormick & Co., received Mar. 1, $3,050; Mar 2, $4.050; Mar. 3, $8,450; Mar. 4, $7,950; Mar. 5, $4,450; Ontario, Mar. 1, $8,-758.40; Mar. 2, $3,059.86; Mar. 3, $3,313.29; Idaho, for February, $23,700; Silver King, for February, 52,700 lbs.; Paradise, Feb. 29, $4,-100; Mar. 7, $4,139.81; Stormont, Mar. 2, $6,-943.04; Ontario, Mar. 4, $3,392.11; Northern Belle, Mar. 1, $6,362.99 ; Mar. 2, $5,273.91 ; Mar. 9, $6,728.29; Ophir, Mar. 2, $14,205.80; Christy, Mar. 5, $3,545.27; Mar. 9, $6,952; Barbee & Walker Co., Mar. 5, $2,049.67; Stewart No. 1, Mar. 6, $8,000.

*Desiring to make our list of Bullion Shipments as complete as possible, we will be tbankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

PERSONAL.—Mr. J. S. Pbillips, M. E., for many years a resident of tbis city, left for New York this week, where he will reside in the future. Mr. Phillips bas desired us to express thanks for past favors from his numerous widely-distanced patrons duriug a residence of thirteen years on the Pacific coast. He will establish himself in New York in a similar business to that conducted herc, examining and reporting on mines, assaying and instructing in assaying. Mr. Pbillips is the inventor of a number of conveniences for assaying, etc., in the field, and the author of that eminently practical work "Tbe Assayers', Miners' and Metallurgists' Companion," of which a new edition has just been printed. He may be addressed for the immediate present at the postoffice, New York.

THERE is at present $45,000,000 wortb of gold bullion in the New York Assay Office.

ALL danger of general starvation in Ireland now seems to have passed.

MINING SUMMARY.

The following is mostly condeosed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

CAVED.—*Ledger*, Mar. 6: On Monday, a large cave occurred at the Amador Gravel Co.'s claim, two miles east of Jackson. Capt. Bluxome, W. Naylor and another man were working on the claim at the time. The bank upon which they were operating with the giants, is 100 ft. high. All of a sudden the bank slipped from its moorings, some 130,000 or 140,000 ft of gravel being displaced. The two giants were covered with the debris to the depth of 13 or 14 ft. The men had a narrow escape but managed to get through without a scratch. A strong stream of water was turned on, and the giants were uncovered in a few hours, and hydraulicing was again in full force.

BUTTE BASIN. The gravel is said to be of an ordinary character, not remarkably rich, but the tendency is to improve as the deposit is penetrated.

CON. AMADOR.—The Con. Amador company have put on quite a number of new hands lately. The 40-stamp mill is running to its full capacity.

MONO.

KING BER.—Bodie *Free Press*, Mar. 6: Sinking the shaft will be continued to the 300 level, when a station will be opened and crosscuts and drifts started for the company's ledges. In the tunnel on lode No. 2 the ledge is improving and becoming more solid.

STANDARD CON.—The shaft is down 803 ft. The crosscuts, east and west, 700 level, are making excellent progress. The north drift, from the east crosscut, 500 level, is in 71 ft. The ledge in this drift is three ft wide of good ore. The south drift, 385 level, has a total length from the main east crosscut of 382 ft. The ledge here is two and a half ft wide, and is looking well. The upraise from this drift has reached a hight of 52 ft, where the ledge is three ft wide of very rich ore. The upraise on the Cook ledge 56 ft shows a vein four ft wide of good milling ore. Upraise No. 2, in the north drift, is up 82 ft. The ledge is four and a half ft wide, and looks well. The north drift on the east ledge, 300 level incline, is in 187 ft. The ledge in the face of this drift is two and a half ft wide, of good average ore. The south drift from the west crosscut, 300 level incline, has a total distance of 200 ft. The ledge here is three ft wide, and looks well. The north drift, 550 level, is in 95 ft, with a ledge in the face of the drift four ft wide, of good milling ore. In the north drift, 385 level, the ledge continues to hold out in size, as well as in the quality of the ore extracted. The West Standard ledge is about four ft wide, of very rich ore. The ledge in the Gilden stopes is four and a half ft wide, and looks well.

BULWER CON.—The north drift on the Ralston ledge is in 80 ft. The ledge is three ft wide of good ore. The south drift is in 82 ft. The ledge is two and a half ft wide. The north drift on the Stonewall ledge is in 90 ftfrom the winze. The ledge in this drift is about two ft wide, of good ore. The north drift on the Stonewall ledge is in 88 ft. The ledge is two ft wide and looks well. The stopes continue to look well.

SUMMIT.—The north drift, 530 level, is in 118 ft. The ledge is about two ft wide. The south drift is in 129 ft. The ledge is about two and a half ft wide, and looks well. An upraise has been started 97 ft south of the shaft to connect with the 450 level of the Standard mine. The upraise is up 10 ft, where the ledge looks about the same as in the drift.

TIOGA.—The main shaft is 803 ft in depth. The bottom shows seams of quartz. In east crosscut, 620 level, the face shows seams of quartzite mixed witb porphyry. Upraise on vein No. 3, from 520 level, is up 139 ft. The walls are four ft apart, very hard and regular.

ORO.—The main shaft is 71 ft below the first level. The west crosscut, tunnel level, is in 205 ft, 14½ ft of wbich is quartz of a lively character, heavily charged witb sulpbides carrying gold and silver.

BOSTON CON.—On the 200 level the drift bas been run on tbe ledge 115 ft. It is well-defined, about two and a half ft wide, and samples assay from $30 to $40 per ton. There are 75 tons on the dump. The double-compartment shaft, started from tbe 200 level is intended to sink until the 300 is reached.

NORTH STANDARD.—The east crosscut from the combination shaft has cut a body of favorable ledge matter, consisting of quartz, clay and porphyry. The quartz is of a bright, lively character, and looks well. The crosscut will be continued until the Concord ledge is cut, when drifting on the ledge and stoping ore for milling purposes will he commenced.

SOUTH NOONDAY.—Crosscutting on the 150 level cast and west is being made. The east crosscut is in 25 ft. The ground in the face is favorable, with indication of cutting the Cummings ledge. The west crosscut is in 18 ft, in a soft formation, with here and there bunches of quartz and clay.

QUEEN BEE.—The north drift, 400 level, is in 143 ft. The ledge in the face is in ore of fair grade, containing no waste whatever. When the drift is in 150 ft the ledge will he crosscut east and west to the foot and hanging walls to determino the widtb of the ore body.

SOUTH BULWER.—The shaft has a depth of 533 ft with the bottom in good working ground.

HOMER.—Total length of tunnel, 136 ft. At a point 122 ft from the mouch of the tunnel the vein was intersected and found to be three and a half ft wide, all good milling ore, and showing coarse gold. It will mill from $30 to $40 per ton.

CON. PACIFIC.—The north drift on the 400 level has a total length of 153 ft. A vein three and a half ft wide bas been passed through, which prospects first olass. The south drift on the same level also has a total length of 153 ft. The station at the 500 level bas been completed and a crosscut started east.

SILVER HILL TUNNEL.—A contract has been let in the workings west from the Oro main shaft, and the work will be pushed to completion as fast as men aud money can do it.

BOOKER.—Bodie *News*, Mar. 5: The drifts north and south on the 400 level are being advanced rapidly. The second eight-inch plunger has been placed in position at the 250 level, and combined are sending out 23 inches of water. The 10-iuch plunger will be put in position next at tbe 500 level. An upraise will be started on the vein and connection made with the 400 level for the extraction of ore. Sinking the shaft will be commenced for the lower levels.

ORIGINAL SUMMIT.—Work in the drifts on the ledge at 100 level has been discontinued, and sinking the shaft will be continued to the 200 level, when a station will be opened and drifting commenced.

SONORA CON.—The crosscut at the 100 level is in 133 ft. The formation has changed to a light-colored porphyry, and the rock would indicate the near approach to a ledge.

DOUBLE STANDARD.—Work has been resumed in the west crosscut from the bottom of the winze. The crosscut is at a depth of 300 ft, and in very favorable formation.

MCCLINTON.—The west crosscut, 500 level, being run to cut the Sharon, Pacific and intervening ledges, bas been passing through seams and bunches of quartz, and has attained a total distance of 312 ft. The north drift, on the Eshington ledge, 675 level, has attained a distance of 100 ft. Three ft of the ledge next to the footwall is much better ore than was exposed in the mine at any other point.

NEVADA.

WASHINGTON NOTES.—*Foothill Tidings*, Mar. 6: At the Yuba gold quartz mine they are driving the lower tunnel and 60 ft in the new ore chute. The ledge is from two to seven ft wide and fine looking ore. They have about 150 tons of this ore, taken out while drifting, now on the mill dump. The Fall Creek (Lindsey) mine is looking well. They have opened a new chute of ore in one of the upper levels, which shows well in free gold and sulphurets, and the ledge in the old workings still holds its own in siz and quality. Foster & Grissell, below the Fall Creek and near the Yuba company's dam, have a fine prospect. They have a large ledge, and from it they had some rock worked which paid $33 per ton. The Ole Nelson mine, on Diamond creek, is idle, but Mr. Nelson informs us that as soon as spring opens he will start work again, as the last crushing of ore from the lower tunnel paid very well. Mundy & Freeman have a fine prospect on Grouse ridge. They sunk a shaft on what seems to be a decomposed quartz ledge, and as high as $60 to the pan was taken out while they were sinking. Mead & Cole have a good showing in a quartz ledge in Canyon creek. The Helgleson mine, on Canyon creek, is bonded to parties in San Francisco for a good price. The Mt. Zion gravel mine, on Poorman's creek is showing good prospects in the present workings.

LIVE YANKEE.—The outlook is very encouraging. The last crushing of 100 tons of rock yielded a large amount of gold. The owners were well pleased with the result. The new shaft that was being sunk on the south side is completed.

THOMAS.—The mill, which has but 10 stamps, cannot take all the rock that is broken. There is at present sufficient broken quartz stowed away in the drifts to keep a 20-stamp mill steadily employed for six months.

OLD WHEEL.—Some rich rock is being crushed at the Keith mill. It yields $20 per ton.

MORGAN.—Situated on Gold flat; is being slowly developed. The ledge is large, but of small grade. The ore is easy to extract.

EL CAPITAN.—*Transcript*, Mar. 3: Some fine specimens of gold-bearing ocher were found in the east crosscut of the north level, 75 ft from the incline. The two-ft ledge that was struck 32 ft from the incline has been followed 43 ft, and shows 20 inches in the head of the drift. Between the ledge and the footwall extends a two-inch streak of ocher, two pounds of which realized $3.50 in coarse gold. There are 45 tons of good looking ore on the dump, and preparations are being made to stope in the south drift. The air shaft to tap the south drift 130 ft from the incline is finished. It is three by four ft in the clear and timbered with two-inch plank.

JACOBS & SARGENT.—About 35 tons of gravel, taken out while sinkiog the new shaft, on being crushed yielded $600 worth of gold. Owing to an accident to the pump the raising of gravel has been delayed for a few days, but everything is now ready to push ahead once more.

PIONEER REDUCTION WORKS.—Fifty-six tons of sulphurets, reduced a few days since, yielded as follows: Gold, $80 per ton, or within less than 10% of 6re assay; silver, 428 ounces, or 85% of assay. The cost of extracting the latter was but $2 extra per ton. Another lot of two and one-half tons of sulphurets was worked and yielded 90% of assay.

PLACER.

CENTENNIAL.—*Herald*, Mar. 0: Is one mile from Michigan Bluff, and has a very favorable aspect at the present time. The owner bas negotiated for a mill, which will be in course of erection soon.

PARAGON.—For tbe month of February the drift yielded 504 ounces of gold, wbich net, clear of all expenses, $8,000. When it is considered that this is a regular thing, likely to last for many years, the value of the mine can be appreciated.

FRANKLIN.—Dutch Flat *Forum*, Mar. 4: The work consists of a prospecting tunoel, which follows the bedrock, which is a slight incline pitching towards tbe town for a distance of 550 ft, when it disappears, and at present no bedrock has been discovered, although the tunnel bas been pushed ahead some 50 ft further on an incline of nearly 45 degrees. A good track is laid and hoistiog works rigged for taking out tbe gravel which is dumped at the bead of Bear River tunnel; a pump is also connected with the works, which keeps tbe mine clear of water. Ere long we bope to chronicle the discovery of rich-paying gravel.

TUOLUMNE.

STONER & BARKLEY—*Independent*, Mar. 6: Said to be the west extension of Rice and joins tbe Shanghai on the north. Has some very encouragiog prospects which indicate that it may be classed among the valuable milling veins.

SHANGHAI.—Was discovered in '53, and has yielded many thousands of dollars. Application has been made for a patent. Recent operations have given good prospects; the vein has many feeders and gives promise of richness.

HENNESSY & KING.—Located in 1856 by an Austrian, who discovered three pockets along the vein, and just below the surface exposures that netted $10,000. To extract these pockets only required the labor of two men, with picks and shovels, about two weeks. The present company continue to work tbe vein with promising results.

NEVADA.

WASHOE DISTRICT.

OPHIA.—Gold Hill *News*, Mar. 10: In crosscut No. 2, 2100 level, the vein widens and improves in quality going north. The winze, 40 ft south of the main east drift, is down 55 ft. The north and the south drifts in the Hardy vein, 2200 level, are 138 and 140 ft respectively; both are in good-looking quartz. The drift north in the Hardy vein, on the 2300 level, is in 160 ft. The joint Mexican crosscut east on this level is in 137 ft.

BELCHER.—On the 2760 level the winze has 100 ft yet to go before encountering the ore vein found on the 2700 level. The south drift on the 3000 level is now 300 ft in length. On the 3000 level the face of the south drift is under the crosscut on the 2760 level, in which the ore was found, hut is from 75 to 100 ft west of whore that vein ought to lie on this level.

YELLOW JACKET.—A softer formation containiug more quartz has been encountered in the crosscut west, 2700 level; total length, 110 ft. The north winze is in porphyry; total deptb on the slope below the 2700 level, 250 ft.

OVERMAN.—Crosscut No. 2, 1900 level, has passed through a mixture of quartz and porphyry into a beautiful quartz formation which looks and promises well. The drift on the 1700 level has been put in working order and a raise started above the winze from tbe 1700 to the 1900 level.

SIERRA NEVADA.—The north drift on the 2400 level is encountering good vein material; total length, 385 ft. The north drift on the 2300 level is 535 ft north from the east shaft. East crosscut, 2300 level, is 100 ft, face in vein porphyry; winze below the 2400 level, 135 ft north of the incline, down 53 ft.

ALTA.—The north and south drifts are being extended along the ore vein, and are still encountering most promising indications; total lengths respectively, 495 and 400 ft. Lady Washington crosscut No. 1 west, 1550 level, is in 65 ft.

CALIFORNIA.—The crosscut west on the 850 level is in 63 ft. Crosscut west, 1500 level, is in a heavy vein material, carrying some quartz. The drift south from Opbir, on the 2300 level, has reached a length of 200 ft.

BEST & BELCHER.—The joint Con. Virginia crosscut east on the 2000 level bas attained a length of 100 ft, and is penetrating hard rock.

UNION CON.—The winze from the 2400 level has attained a depth of 25 ft in vein material carrying quartz. The shaft is 47 ft below the 2400 level. The main south drift on the 2400 level is still in a heavy vein formation carrying quartz; total length from the Union shaft, 310 ft.

SUTRO TUNNEL.—The north header is in 2,336 ft, carrying it 268 ft into Con. Virginia ground.

SAVAGE.—The drift from the 2400 level of the C. N. S. shaft for the incline is 473 ft in length, and is still encountering hard rock and a heavy flow of water.

SCORPION.—The crosscut west on the 500 level is still in a formation of highly-mineralized matter. The crosscut east is also in vein material.

ANDES.—The winze from the 350 level bas some very good-looking rock, as has the drift east on that level.

CALEDONIA.—Still pushing the drift south on the 1900 level and penetrating a formation of soft vein porpbyry; total length, 800 ft.

CROWN POINT.—The wioze is penetrating softer ground; total depth, 160 ft.

BELMONT DISTRICT.

BELMONT.—*Courier*, Feb. 28: Is opening up a fine body of ore in the 300-ft drift now running north. The vein at face of drift is four ft thick, with bunches of fine sulphuret ore all though it, and improves every foot of advauce. The concentrating mill has started up and can reduce all the low-grade ores into bullion at a profit.

SAN ANTONIO.—The 450 crosscut has a total length from foot of incline of 90 ft; it has passed through a bar of very hard slate, and is now running in a very good formation and will cut the vein in 15 or 20 ft further progress.

BRISTOL DISTRICT.

BRISTOL.—Pioche *Record*, Feb. 28: Has made a location comprising 000 acres, adjoining the eastern limits of the present townsbip. The boring apparatus will soon begin sinking for flowing water. Then operations will commence in the erection of the mill and furnace.

HILLSIDE.—The foundation of the old furnace has proven to be a bonanza; over $10,000 in bullion has already been taken out, melted into bars, and there is still in sight about $1,000. It is thought that some $24,000 in all will be taken out.

EUREKA DISTRICT.

UNION.—Eureka *Sentinel*, Mar. 2: On Prospect mountain; has out 25 tons of good ore, and the body seems to be gathering strength as it goes down.

EUREKA CON.—Second level—North drift in 15 ft. Third level—Northwest drift in 174 ft. Seventh level—Northeast drift in 177 ft; north drift in 60 ft; winze in 67 ft. Eighth level—Southeast drift in 182 ft. Ninth level—Upraise in 56 ft. Tenth level—East drift in 190 ft. Eleventh level—North drift in 100 ft.

CUSTOM ORE.—The Connolly has sbout 200 tons on tbe dump, tbe Home Ticket 100, and the California 75. The ore is now being dellvered from these several mines to the Richmond reduction works. The indications are that there will be a larger supply of custom ore from outside mines tbe coming season than at any previous period in the history of the district.

JACKASS RABBIT DISTRICT.

DAY.—Pioche *Record*, Feb. 28: The drift from open out, upper works, bas progressed 24 ft, the face being all vein matter, with spots of very rich carbonate ore. The east incline shaft is down 94 ft from tunoel level. Drift west for the cave ore body bas commenced. All efforts are concentrated in the open cut drift and east incline. In tbe incline the crystal line fissure makes a splendid sbowing.

JETT DISTRICT.

JETT CON.—In tbe Centennial ledge the quartz has thickened up to five ft from foot to hanging walls.

CENTENNIAL.—The shaft is down 70 ft, with rich sulphuret ore in the bottom.

CALIFORNIA.—The big strike of good ore bas created quite a stir hereabouts, and many who own good prospects here are coming in to work their claims.

LIDA VALLEY DISTRICT.

MINING ITEMS.—Esmeralda *Herald*, Mar. 6: In the last few weeks several valuable strikes have been made in some of the mines that are being prospected to a greater depth than ever bcfore. Most notably is the strike in the Fortunatus mine. In crosscutting at a depth of 180 ft a large body of excellent free-milling ore was struck, assays from which sbow from $60 to $95 in gold, and from $30 to $45 in silver per ton. This lead is one of which the size of it is not known at any depth. Good milling ore of a low grade is found for 3,000 ft in length, and for a width of from 200 to 300 ft. Recent developments on El Capitan, the first east extension of the Fortunatus, bas opened up a body of free-milling gold ore two ft wide, which assays several hundred dollars per ton. From other mines in the district ore is being extracted, principally from the Martin & Henley, Centennial and Brown & Henry. Brown's Hope, Death Valley, Cinderilla and Lida Hill are all making tbe boys happy. The Suwanee is clearing out aod timbering the main tunnel, preparatory to driving it ahead and striking the lead at a depth of 150 ft from the surface.

WINNEMUCCA DISTRICT.

ITEMS.—*Silver State*, Mar. 6: In a recently located claim in Winnemucca mountain, west of town, the croppings of tbe ledge are over 20 ft wide, and the ore is different from any bcretofore found in the mountain. A sample of the ore assayed $1,880.50 to the ton, of which $262.-74 was silver and $1,023.76 gold. The owners of the Leonora are sinking an incline on the ledge and find some high-grade ore. The Big Nick miners have struck wbat appears to be a large deposit of low-grade ore. The owners of the Silver Wedge, while working assessments, found some very good ore in the ledge.

PARADISE.—Never looked better than it does at present. There are between 400 and 500 tons of ore at the mill, and a small force of miners keep up the supply on the dumps at the mine. The ore works from $00 to $80 per ton, and the mill produces from $25,000 to $30,000 a month in bullion.

BULLION.—The ledge is from 8 to 20 ft wide, and the ore works from $30 to $80 per ton.

MOUNT ROSE.—Some of the ore was recently worked in San Francisco, and went up in the hundreds per ton. A few tons of a different character of ore is now being reduced at the Paradise company's mill.

ARIZONA.

HEAD CENTER.—Tucson *Star*, Mar. 4: The north or old shaft is down 240 ft, with good ore at the bottom and a 50-ft drift on the ledge. There are 50 tons of ore on the dump at this shaft valued at $7,000. The new shaft is down 180 ft. The ore on the dump of this latter shaft is rich. There are 00 tons that will yield $200 per ton. Three hucketsful containing a mass of beautiful born silver literally bespangled with gold was brougbt up from the bottom of the shaft. The vein from which the ore was taken is strong and well defined. Sample assays from the workings of the shaft and drift gave an average of over $250 per ton, all of the ore carrying a large percentage of gold.

SUNSET.—The main shaft is down 60 ft, all the ore heavily impregnated with chlorides. The same character of ore is found in shaft No. 2; at a depth of 50 ft the ledge bas widened to seven ft, and as depth is attained, appears to be still widening. The body of the ore in sight is very large aud of a high grade. There are 200 tons of ore on the two dumps.

MONITOR.—About 600 ft of the ledge has been ascertained by sinking and stripping. The croppings in many places are very bold and rich. At every point where the ledge has been cut or sunk upon a vein of from three to six ft wide has been found, all mineral and high-grade, ranging from $35 to $250 per ton in silver, with a good showing in gold. The deepest shaft is 20 ft, and shows a well-defined vein from top to bottom of about three ft wide.

BELMONT.—There are three drifts running from the main shaft into the vein, all in solid ore. The 40 and 70-ft drifts have not crossed the vein, although in some 20 ft. The 100 level is in 35 ft, and has not yet struck the hanging wall. In the lowest level a shaft is being sunk which is in a solid mass of ore. The claim is 3,000 ft long and 000 ft wide. On the southerly end there are also some extensive developments made, which show the same character of ore in quality and quantity.

SAFFORD ITEMS.—The Delaware mine, one of the late discoveries in the Graham mountains, at a depth of 10 ft gave assays in gold and silver of $3,000. The Copper King has a shaft to a depth of 70 ft, and gives assays of 50% in copper. This mine is situated in the Rio Bonita mountains.

ARIVICA ITEMS.—Gilola has a large body of Longarina ore on the dump. At Ore Blanco, Smith & Hariszly are down to the 100-ft line on the California and crosscutting the ledge. S. S. Arnold is sinking a 100-ft shaft on the Bridgeport mine, showing a body of rich ore.

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A Mexican Mining Town.

Mr. A. D. Temple, formerly of San Francisco, bnt now at the Candelaria mine, San Dimas, Durango, writes the following interesting letter to the New York *Sunday Courier:*

To the mining man acquainted with the sage-brush covered sand deserts, and bleak, snow-capped psaks characteristic of the silver-producing regions of Nevada and Utah, the verdure-covered mountains and shady *quetradas* of San Dimas are a most agreeable change.

Along the banks of ths rushing, noisy stream tbat gives motive power to the *haciendas* in which the rich ores of the district are worked, are numerous orange and banana plantetions, where the light green of the broad-leaved banana plants and the desp green of ths orange show in enticing contrast to the ripe golden fruit. Nestling in the shade of their teller companions may be ssen the brigbt scarlet blossoms of the pomegranate and the ripe fruit as well, looking almost like waxen imitations. White limes and guaves abound on every side in such profusion as to almost destroy their market value. Here and there are to bs seen trees bearing ths alligator pear, with a pulp reminding one in taste and appearance of beef merrow. Farther up, just below the extreme lower limit of frost, the far-famed chsiromoya attains its greatest perfection.

Up the mountein side above the stream are scattered at short intervals numbers of small corn fields usually cultivated by some indspendent proprietor who, secure in having abundant rains to bring his crops to maturity, lies lazily under the grass-thatched roof, smokes his corn-ehuck cigarette, chews a huge piece of the roested stalk of the maguey, or dozes away the day supremsly and sersnely indifferent to the latest quotations of Mexican bonds, the next candidate for President, or the highest ruling rates for Mexican dollars in San Francisco, while his wife grinds corn of last year's crop into *tortillas* (the Mexican steff of life), and the brown-skinned babies, naked and unheeded, play and tumble about with the dogs on the floor.

Flocks of green perrots wheel and circle overheed with ceeseless chattering, while occasionally a squad of harsh-voicsd macaws, gorgeous in red heads, yellow bills, blue wings and green teils add their discordancy to ths general din. A speciss of black phsasant apparently, kuown as "chichalaka," calls to its mate from the heavy shede of a wild fig tree with a voice forcibly reminding ons of the grating of an ungreesed windless. The black vultures flap lazily around seerching for cerrion, and whsn found, light on the trees around with the business-like gravity of undertaksrs and the judicial solemnity of a coroner's jury.

A "kelela," that curious link between the eagles and vultures, first described, I believe, by Audobon, is perched in a tree by the sids of the trail, waiting Micawber-like for something to turn up. His yellow beak and white head causes him at first sight to bs mistaken for our repressntative bird. Frightened by the clattsr of horses' hoofs, a doe with her two fawns darts from ths edge of the cresk across the narrow trail and disappears in the heavy brush on ths other sids.

Wild life is abundant, and it is witb surpriss that rounding a sharp turn we see San Dimas but a few hundred yerds ahead. Built on a steep declivity with its lower buildings abutting on the creek, and its upper ones extending up towards the top of the spur of the Sierra Madre that towers 4,000 feet above, San Dimas has the appearancs of having slid from some more lofty altitude to its present position, and being only prevented from going lower by the abrupt cliffs that bound the west side of the creek, on the summits of which the wild goats and deer show themselves fseding undisturbed, and apparently within easy rifle shot.

A mule train is slowly passing through tbs main strest as we ride up, loaded with silver ore for some of the several haciendas, that we can see below us; on ahead rides a dark-skinned *muchacho* astride of the old bell mare, and behind straggle along the pack animals, stopping as occasion offers to pick up a banana peeling or an old straw hat that they munch with ths keenest appreciation as they again start along, oblivious to the objurgations of the arrieras, whose epithets if translated would excsl in searching and earnest eloqueuce the most impassioned accents of a fishwoman.

Each mule is carrying at least a *carga* (300 lbs. Spanish), and to every five mules there is an arriero to attend them, and refasten the sacks in case they get loose from the network of rawhide ropes that fastens them to the pack eaddle.

On either eide of tbe cobble paved street we have a view of the mixed assortment that forms the stock of a Mexican storekeeper. A sack of dried red pepper and a bale of sun-dried beef lie on the floor under a roll of French calicoes, and some unbleached eheetinge that are manufactured in this country. Cans of Blue Point oysters and Columbia river salmon jostle against Bordeaux sardines and English sweet biscuits. Spanish wines, French brandies and cordials, English "Old Tom," gin and Mexican "mescal" (a fiery but pure liquor distilled from the juice of the century plant), and Amerioan bitters etand side by side on the shelves.

The dry goods are all of European make save tbe coarsest cotton goods. With the exception of black, which is the chief favorite, the colors are of the brightest, red being very popular. American fabrios are conspicuous by their absence, whioh ie certainly etrange taking into consideration the geographical position of the two countries, and the reputed enterprise of ths Yankee manufacturer.

American firearms, however, and ammnnition are fully appreciated to ths almost total exclusion of all other mekes. Winchester repeatsrs and Colt's six sbootsrs are more familiar to the Mexicen ranchero or miner than to ths averags New Yorker.

The stores are variety stores in the most liberal sense of ths word, and it is impossible in a short article to give more than the msrest hint of the various wares that make up their assortment.

At the lower end of the strest is the plaza, the only piecs of level ground in the town, and containing perhaps one-sixth of an acre. Around it are built ths court-house, jail and church. I write them in their order of merit, for the Mexicen priests are, as a rule, to put it mildly, "a hard lot."

Back of the plaze on the mountain side beneath a dilepidated shed, is a crude attempt at a refining furnacs known as a *vaso*. In appearance it is half way between a blacksmith's forge and an old-feshioned bake oven, such as thsy have in "Ole Virginny." Here the concentreted tailings ere brought from the verious haciendas and the gold aud silver extracted by a process which, though thorough, is rather expensive.

A crowd of Mexicans are usually gathered around it, watching the operetion which is carried on by two men, one in lieu of an engine acting as motive power of the bellows, and the other being expert and general manager of the business.

The airy costume of the loungers, if introduced in Nsw York during the dog days, would undoubtedly become popular could some members of the Knickerbocker club bs induced to set the feshion. Its intrinsic merits are cheapness, coolness and simplicity. The items are leather saudals, wide cotton drawers cut "sailor fashion," supported at the waist by a red or scerlet sash, calico shirt with very abbreviated tails worn outside of ths drawers, allowing a fres passage of air, a hroad-brimmed palm leaf hat; and a breech clout called a "cotensie" completes the outfit. Total value, about $3.50.

Up the *cordon* behind the *vaso* winds a serpentine trail fit only to be traveled by mountain-bred animals. Far ebove us a cloud of dust shows that another pack-trein is coming, probably loaded like ths first with silver ore, as most of the mines, with ths prominent exceptions of the Soledad and Candelaria, ere situated on the other side of the mountain.

The sun is bsating down vigorously, and we will take sheltsr bsneath the cool portal of our friend Don Antonio, smoke cigars equal to the best Havanas, drink cool lemonads and, whils our horses are resting and feeding, make our plans for starting to visit ths celebrated mines of Tecolole and Promontorio, that are now lying idle, in the early morning bsfore the sun shines on yonder high peak to the westward. Till then, *adios.*

A Mine Owner's Mistake.—A men, now a prominent merchant of Virginia City, won at poker an undeveloped gravel claim near Nevada City, worth in the neighborhood of $200. His friends had the laugh on him for several days regarding his "investment," and asked him what proportion of the taxes he would pay in case they accepted the property as a gift. He finelly got mad at their incessant guying, and told them they would see he was not such a fool as they took him for before he got through with that mine. He then wrote to some capitalist acquaintauces that he had a claim worth a fabulous sum, which he would sell for $2,000, being hard pressed financially. The bank was next visited, $500 worth of gold dust and nuggets bought, and the claim thoroughly "salted." When the intending purchasers arrived they prospected the ground a little, and the panning out was attended by big clean-ups. They paid the $2,000 tbe same day, and got possession of the ground. Work was at once begun, and thsy took out $8,000 insids of three weeks. The "salter" was so taken aback that he did not smile for a month, and the parties to whom hs confided his shrewdness at the time of its perpetration, never meet him to this day but they ask him if he has another gravel mine to sell.—*Nevada Transcript.*

Hot Water on the Comstock.—Ths Savage new water is quits milky, which shows that it comes from a place where there is clay or decomposed quartz. Before the water burst in they had cut through several small veins of quartz and eome water had been encountered. While superseding a small punp by a large one the flood came. It is not ecalding hot and has been encountered 125 feet on the slope above the 2400 level, 240 feet below the 2200 level. A strong flow of hot water was tapped iu the west drift on the 2400 level of the Chollar. The hottest water yet encountered on the Comstock is in the Belcher on the 3000 level where the diamond drill was sent east to guard against an influx. It is with difficulty that its exact temperature can be taken, as the hole is horizontal. By holding the bulb of the thermometer under the drippinge from the hole the mercury rises to 162°. Could the exact temperature of the water be obtained hy fastening a bulh in the hole it would doubtless add a few degrees to the above. Here on the mountain water boils at 198°.—*Gold Hill News.*

The certificate of reduction of the capital stock of the Comet mining company, from 150 shares at $100 per share to 150 shares at $5, was filed last week.

A New Method of Desulphurizing Auriferous Pyrites.

There is no portion of the various processes for workiug gold ores which has more occupied the attention of charlatans, as well es that of skilled metallurgists, than the matter of rendering auriferous pyrites accessibls to the ordinary method of amalgamation. Amalgamation, yielding, as it does, quick returns at low cost, becomes valueless when applied to the treatment of sulphurets. Hence it is that in many mines when the undecomposed ores below the natural drainage level are reeched, only a small pert of the precious mstal can be extracted with mercury by the ordinary mill process. In such cases the sulphurets must first be concentrated from the tailings, and subjected to soms chemical or other process for the slimination of the sulphur, which is the binding substancs or force which rstains the gold so firmly in its mineral embrace, that amalgamation, however carefully employed, is powerless to take it away. Ths process most usually employed is calcining and chlorinizing—a process whicb requires a large and expensive plant and skilled workmen. This process is so costly that it is only applicable to very rich mines, or to bs worked as a specialty, by buying ths concentrated sulphurets of numerous mines of moderate value. Hence the question of cheap desulphuriziug is a very important one. At the late meeting of ths American Institute of Mining Engineers, the following paper was read, in relation to this matter:

We have had occasion recently to examine a process which embodies features that are likely to ensure ultimets success in securing a cheap mode of desulphurizing auriferous sulphurets. Prominent emong its advantages ars great simplicity, and, therefore, low first cost.

An Experimental Plant

Is now in operatiou et the works of the Manhattan Refining Company, Jersey City, of which Mr. Walker, the inventor of the new process, is the president. The principls upon which it is hased is the following: The crushed ore is blown through a long series of pipes at a red-heat, by means of a mixture of air and steem. During its pessage through these pipes, the sulphur of the ore is oxidized, passing off as sulphurous acid, while the fiue desulphurized ors is allowed to ssttls in a dust chamber. Ths gases, which are still charged with some fiue dust, are passed through a watsr trap, which washes them, so that euy possibility of mschanical loss, by suspension of fins particles in the gases, is precluded.

Ths plant consists of a charging bopper from which the ore is carried by a feeding screw into a receptacls, where it meets with ths mixture of air and steam. The steam, before coming in contect with ths ore, passes into an injector, which is also connected with the air pipe. The air is now supplied by a small compressor, whicb is usually run up to 10 pounds, its pressure being, thsrsfore, approximately equal to that of the steam ussd. Ths current of air and steam carry the fine ors into the 2½-inch wrought-iron pipe, which is heated in a special furnace. The length of pipe exposed is about 360 fest, made up iu sections, ths joints being in the middls of the longer straight section, while an eesy aud gradual hend makes up the shorter side of the rectengle, the shaps in which the pipe is placed in ths furnecs.

An Apparent Objection Removed.

Mr. Walker's experiencs has been that the inner surface of the pips is rapidly coated with an adhesive crust of magnetic oxide—a fact which will not appear astonishing to those who have followed the progress of the Barff method of protecting iron against rust, as the very conditions described by Prof. Barff as necessary in the production of a magnetic film, are complied with in this case. Ths formation of such a lining within the tubes is, of course, a very favorable circumstancs, as it will act as a rsliable protection against any corrosion of the interior of the pips, ths duration of which will, therefors, depend solely upon the rats at which it is burnt by the gases of the fuel. The choics of the latter will, therefore, be of soms importance, and naturally wood, if it can bs readily obtained, will be most suitable.

The Rate of Feeding the Ore

Will naturally depend, to some extant, upon its nature; material higher in sulphur demanding a larger volume of air, and admitting only of a slower feed. We are informed that the capacity of the furnace now built is about three tons per pay. It is thought that much more can be obtained, and that it will be cheaper to run poor ore and tailings though the furnace in bnlk than to dress it hy mechanical means, and work the rich concentrates obtained. Among the material experimented with is some Haile mine ore, running, according to an assay made by Messrs. Carsten, 1.4 ounces of gold, worth $28.-94. The calcined ore was found by the same chemists to hold 1.50 ounces of gold, worth $31.60 per ton. By amalgamation test, 1.20 ounces, or $24.80, were extracted, eo that about 80% of the gold contained in the sulphurets was rendered accessible, not counting the amount prohably lost during the process of amalgamation.

We may add that the calcined pyrites were found to hold only 5.03% of sulphur. As far as the process has been developed the results obtained are highly encouraging. The simplicity of the plant, the absence of all expensive or ponderous machinery, and the wide range of capacity which it possesses, will commend it to those who are struggling with rebellious ores.

Native California Fishes.

Ths lsst report of tbe Fisb Commissioners is followed by one upon the native fishes brought to the San Francisco markets, written by W. N. Lockington, who watched the markets for the purpose.

As the fishermen do not distinguish many of the marine species from sach otber, salling several distinct species, sometimes belonging to different families, under such nemes as smelt, rock fish, sole, etc., and es no record of number or weight is kept, all estimates of the actual quantity of any fish sold in the markets must bs ths merest guess, and all that can be done is to form an approximate opinion of their comparative abundance or scarcity.

More then 90 species are brought to market in greatsr or less numbers, but the groups of fishes which are most important and prominent ere the *Salmonidæ*, including the salmon, trout, and true smelts, ths *Embiotocidæ*, or viviperous perch, a family confined to this coast (one spscies excepted), the *Pleuronectidæ* or flat fishes, 13 spscies; and the rock-fish or rock-cod, under which title are included soms 14 or mors species belonging to the femilies Scorpænidæ and Chiridæ.

Nsxt to these come the sturgeon; the *Clupeidæ* or herriug family, which furnishes thres abundant species; the cod-fish tribe *(Gadidæ)*, which givss us only only ons common species, the tom-cod *(Microgadus californicus)*; the *Atherinidæ*, or mullet smelts, and the *Sciænidæ*.

Several species of *Scombridæ* (mackerels and their relations) occur along the coest of California, and are occasionally brought to market, especially iu the autumn, but nsvsr in abundance. Of this tribe the Pompino *(Poronotus simillimus)* is the most regularly procurable, and is highly prized for its delicacy.

The only fresh watsr fishes brought to market are the Secramento river psrch, large quantities of which are consumsd in the interior of the State; four species of *Cyprinidæ*, the most important of which are the miscalled pike (*Gila grandis*) and the *Orthodon;* and the sucker (*Catostomus occidentalis.*)

To thess groups, with the excsption of a single species of skate, belong almost all the native fishes habitually eaten by the white residcuts of ths city, sincs the various species of Blennidæ, popularly celled eels, end the large marbled sculpin *(Scorpænichthys marmoratus)* ers of very occasional occurrence, as is also the Barracuda (*Sphyræna argentea*). Verious spscies of *Cottidæ* or sculpins, of rays and sherks, stc., are, however, eaten by the Chiness. The rock-fish or rock-cod, sometimes evcn called cod, have no relationship whatever to the true cod-fish, but furnish our markets with a vsry large proportion of the supply, as most of thsm occur throughout every month of the year. The two species of *Sciænidæ*, which are tolerably abundant, are the kiug-fish and the sea-bess, both delicious fisb; but much of the food sold as sea-bass at the resteurants is sturgeon.

Among ths flet-fishes one is known by the dealsrs as Turbot, another as Bastard Turbot, a third as Monterey Halibut, a fourth as Flounder, end a fifth is the true Halibut (*Hippoglossus*), which is occasionally brought down in ice from Pugst sound, and is now and then teken at the Farallones; leaving eight quite distinct species to be sold under the common name of "sole," although not one of them is a true sole.

Two species of the *Atherinidæ* are commonly sold as smelts, and the *Salmonidæ* furnish three species of true smelts, which are by soms dealers distinguished as "Silver Smelts."

The herring *(Clupea mirabilis)* is abundant during the winter and spring months; the sardine (*Clupea sagax*) is present in smaller quantities during most of the year; and the Anchovy (*Engraulis ringens*) is abundant in tho bay.

No Premium on Old Coins.—The Treasury Department is very often in receipt of letters asking whethsr there is any truth in the frsquently published statement that the Government has offered a large prsmium for the U. S. silver half dollars coiued in the year 1823, and also asking whether minor coins of ths same year and prior years are purchased by the department at a premium. For the information of all concerned the Secretary announces that ths Government pays no premium on any of its coins, and redeems them under certain regulations at their face value only, regardless of tho year of coinage.

We notice the following in eome of our Eastern exchanges: Strange as it may seem, it is undoubtedly true, that the iron and copper mines of Lake Superior each turned out more solid gold and eilver during the year 1879 than the celebrated Leadville district. And yet they haven't made a hundredth part of the noise about it, nor has there heen hardly a hundredth part of the capital expended in doing it.

Canadian Petroleum Legislation.—Advices from Ottawa under date of Feb. 19th, state that Mr. Colby's bill to amend the Petroleum act proposes to remove the present discrimination against American coal oil by making the test more uniform. The test for Canadian oil will probably be increased, and that of American redneed.

Petroleum Wells in Germany. — The *Frankfurter Zeitung* says that a company with a capital of $250,000, has been formed at Bremen to work the recently discovered petroleum springs in Hanover, and that a similar company is forming in Berlin.

The Engineer.

Engineers—Their Value.

Under this heading the Boston *Journal of Commerce* comments on the engineer who solves problems—not the man, adds the editor, who opens the throttle-valve of a locomotive that goes racing over the track from one city to another, or of him who sets in motion one of the Corliss monsters that drives its thousands of spindles and looms or other machinery—but the civil engineer, who lays out the work that employs the others, deals either in one or the other of two separate and distinct realms—absolute fact or supposition. In the first he is often made to doubt his own sagacity and capability, for he must often change his course of action by reason of deductions drawn from experiment in which all his ideas of strength, elasticity or economy, have strangely departed. If he deals in the second he becomes, as too many have done, egotistical, and by very lack of knowledge or through force of circumstances, is constantly taking up untenable positions, making expensive, unsatisfactory and unsuccessful experiments—in other words, father of failures. Too much of this has been and is done. In many cases the parties are sooner or later involved in an outlay of thousands of dollars, and then comes the legitimate outgrowth of an attempt at the impossible—disagreement, disappointment, lawsuits, bitter feeling, loss of time, money, production, loss to every one involved; and yet it is a matter of every-day occurrence, and one which would have been avoided by the employment of a competent engineer for a day or two at the cost of $50 or $100. Men who know nothing of proportion, strength, elasticity, pressure, torsion, volume or density, get out an idea and patent it, or advise it and get it introduced, and then users get the effect by adoption.

Engineers are not always consistent, we had almost said not honest. They deal sometimes in vagaries or in elements of uncertainty without careful consideration or consultation of authorities who have preceded them, and give opinions or make out tables or results from preconceived ideas of matters to which they never give an hour's consideration in an honest, careful way. In this way they have in a measure detracted from their usefulness and the respect due them. Such a one, however, is always found out sooner or later, and finds his level. A man to do his work in a successful way should be careful in all his statements, and if he does not know a thing for a *sure thing*, say so, and not assume one thing or the other, for it is in engineering as with law—common sense is a pretty sure guide, and will lead you right a thousand times where it leads you wrong once.

In dealing with earth, iron, water, steel, steam, or any of the natural elements or created forces, we must remember that we are only capable, at least, of an approximation; that we must reason and investigate—and if we live to the extreme allotment of life, we are still learners. The profession has in the last decade done much to attract the attention and merit the admiration of men who never think deeply, clearly, or upon forces or matter other than to see results that are the outcome of close reasoning. There is too much of the superficial, too little of the real; to progress we must look closely at all elements, simple or compound; and when we have learned our own insignificance, we have commenced building upon a "bedrock" that does not "heave or settle."

The American Society of Mechanical Engineers.

By invitation of Prof. R. H. Thurston, of Stevens Institute, Prof. John E. Sweet, formerly of Cornell; Prof. William P. Trowbridge, of the engineering department of Columbia College, and other well-known members of the engineering profession, a meeting was held in New York, February 16th, to take steps to form a national society of mechanical or dynamical engineers. There are in this country associations of civil and mining engineers, but the mechanical engineers have had no society, though in England the same branch of the general profession of engineering has an association with 2,000 members, and as a consequence, this branch of the engineering profession has lacked the mutual aid and professional coherence which has characterized the departments of civil and mining engineering, whose powerful associations have proved so beneficial to the members of them.

The meeting was called to order by Prof. John E. Sweet, formerly of Cornell University, and Messrs. A. L. Holley and Samuel S. Weber were chosen chairman and secretary.

The object of the society, as set forth in the original draft of the by-laws and rules for the government of the association, is to enable mechanical engineers to meet and compare notes, and to facilitate the interchange of ideas respecting improvements in the various branches of mechanical science by the publication of papers, etc. The members are to be divided into four classes—regular members, associates, honorary members and junior members. The initiation fees are fixed at $15 and $10, and the annual dues $10. Payment of $150 will entitle eligible candidates to life membership. Seven years' practice as mechanical engineer is a condition of membership, provision being made in junior membership for such as have served for a shorter period.

Addresses were delivered by several well-known gentlemen, including H. R. Worthington, Charles E. Emery, etc. The *Machinist* says: "This movement has been almost spontaneous in its origin, having grown out of a widely extended and increasing desire for a generally recognized society, composed of active and progressive members, to take the lead in dealing with important problems in mechanical engineering."

Useful Information.

Rules for the Management of Steam Boilers.

We are indebted to the Hartford Steam Boiler Inspection and Insurance Company for the following rules, which they expose near the boiler of which they have charge:

1. Condition of the Water.—The first duty of an engineer, when he enters his boiler-room in the morning, is to ascertain how many gauges of water there are in his boilers. Never unbank or replenish the fires until this is done. Accidents have occurred, and many boilers have been entirely ruined from neglect of this precaution.

2. Low Water.—In case of low water, immediately cover the fire with ashes, or, if no ashes are at hand, use fresh coal. Do not turn on the feed under any circumstances, nor tamper with or open the safety valve. Let the steam outlets remain as they are.

3. In Case of Foaming.—Close the throttle, and keep closed long enough to show true level of water. If that level is sufficiently high, feeding and blowing will usually suffice to correct the evil. In case of violent foaming, caused by dirty water, or change from salt to fresh, or *vice versa*, in addition to the action above stated, check draft and cover fires with fresh coal.

4. Leaks.—When leaks are discovered they should be repaired as soon as possible.

5. Blowing Off.—Blow down, under a pressure not exceeding 20 pounds, at least once in two weeks—every Saturday night would be better. In case the feed becomes muddy, blow out six or eight inches every day. Where surface blow-cocks are used, they should be often opened for a few moments at a time.

6. Filling up the Boiler.—After blowing down, allow the boiler to become cool before filling up again. Cold water pumped into hot boilers is very injurious from sudden contraction.

7. Exterior of Boiler.—Care should be taken that no water comes in contact with the exterior of the boiler, either from leaky joints or other causes.

8. Removing Deposit and Sediment. — In tubular boilers the hand-holes should be often opened, and all collections removed from over the fire. Also, when boilers are fed in front and blown off through the same pipe, the collection of mud or sediment in the rear end should be often removed.

9. Safety Valves.—Raise the safety valves cautiously and frequently, as they are liable to become fast in their seats, and useless for the purpose intended.

10. Safety Valve and Pressure Gauge.—Should the gauge at any time indicate the limit of pressure allowed by this company, see that the safety valves are blowing off. In case of difference, notify the company's inspector.

11. Gauge Cocks and Glass Gauges.—Keep gauge cocks clear, and in constant use. Glass gauges should not be relied on altogether.

12. Blisters.—When a blister appears, there must be no delay in having it carefully examined and trimmed, or patched, as the case may require.

13. Clean Sheets.—Particular care should be taken to keep sheets and parts of boilers exposed to the fire perfectly clean, also all tubes, flues and connections well swept. This is particularly necessary where wood or soft coal is used as fuel.

14. General Care of Boilers and Connections.—Under all circumstances keep the gauges, cocks, etc., clean and in good order, and things generally in and about the engine and boiler-room in a neat condition.

Manilla Rope Tests.—One of the most important, and perhaps most critical, operations which have to be performed in connection with torpedo service is lowering the torpedo boats from the deck of a ship ready for being sent on their deadly mission. When it is considered that some of these mischievous little crafts weigh from 8 to 10 tons, it will be seen that the ropes used in thus manipulating them are required to be of the highest quality and most trustworthy make. To this end the authorities at Portsmouth dockyard have recently cast about for a really reliable rope for the torpedo ship *Hecla*. The rope selected is best 3-strand white manilla, of two sizes, namely, 5½ inches and 6 inches circumference, respectively. The 5½-inch rope was guaranteed by the makers to lift 12 tons, and the 9-inch 14 tons. Samples of these ropes were recently tested at Portsmouth, under the superintendence of Staff-Captain Kiddle, the Master Attendant, with excellent results. The lengths tested were each 12 feet, between the gripping points, and the 5½-inch rope did not break until a tensile strain of 12½ tons was reached; whilst the 6-inch rope held out up to 16½ tons, thus giving an ample margin over the guaranteed strength. As a means of comparison, it may be interesting to mention that a 6-inch Italian fiber rope would not stand a strain of more than 13½ tons, whilst Russian hemp rope of the same size cannot be reckoned on for more than 11½ tons.

Glue for ready use may be prepared by adding to a given quantity of best glue, enough common whisky to make it of the proper consistency. Put both together in a bottle, cork it tight, and set it away for three or four days, when it will be fit for use without the application of heat. Glue thus prepared will keep for years, and it is at all times fit for use except in very cold weather, when it should be set in warm water before using. To obviate the difficulty of the stopper getting tight by the glue drying in the mouth of the vessel, use a tin vessel with the cover fitting the outside, to prevent the escape of the spirit by evaporation. A strong solution of isinglass made in the same manner is an excellent cement for leather. The hotter the glue when used, the better it will keep the two parts glued together, hence in all large and long joints the glue should be applied immediately after boiling. Glue loses much of its strength by frequent remelting.

A New Process for Refining Spelter.—We have lately been shown a sample of spelter showing unusual sharpness of crystallization and brilliancy of fracture, which is said to be as nearly chemically pure as the metal can be made. It was made from common spelter, under a process patented by Mr. A. Harnikel, 83 Maiden Lane, New York. We also have a piece of sheet zinc rolled from it cold, which exhibits great ductility and unusual toughness. We are informed that the specific gravity of the new spelter is 7.2, and that its resistance to dilute sulphuric acid is many times greater than that of any grade of this metal hitherto experimented with. For fine brass, cartridges, German silver and artistic castings, we should presume it would have unusual utility. The price ranges from 8½ to 9 cents.—*Iron Age.*

Good Health.

Cold Feet in Bed.

While winter is at hand, and with it the many attendant discomforts and annoyances of a chilly, frosty atmosphere, it is becoming to fortify ourselves against the influences and effects of cold. It is better to be so clothed as to feel a little too warm, rather than not warm enough. One of the common obstacles to personal comfort is cold feet, particularly cold feet at night. When abed one feels that he ought to be comfortable. We may succeed, perhaps, during the day in maintaining a passable degree of caloric in our extremities, but at night we may groan in sleepless torture until the small hours with icy feet. A contributor to the *British Medical Journal* gives a few simple suggestions on this seasonable topic, which we copy here for the benefit of our cold-footed readers:

The association between cold feet and sleeplessness is much closer than is commonly imagined. Persons with cold feet rarely sleep well, especially women. Yet, the number of persons so troubled is very considerable. We now know that, if the blood-supply of the brain be kept up, sleep is impossible. An old theologian, when weary and sleepy with much writing, found that he could keep his brain active by immersing his feet in cold water; the cold drove the blood from the feet to the head. Now, what this old gentleman accomplished by design, is secured for many persons much against their will. Cold feet are the bane of many women. Light boots keep up a bloodless condition of the feet in the day, and in many women there is no subsequent dilatation of the blood-vessels when the boots are taken off. These women come in from a walk, and put their feet to the fire to warm—the most effective plan of cultivating chilblains. At night, they put their feet to the fire, and have a hot bottle in bed. But it is all of no use; their feet still remain cold. How to get their feet warm is the great question of life with them—in cold weather. The effective plan is not very attractive at first sight to many minds. It consists in first driving the blood-vessels into firm contraction, after which secondary dilatation follows. See the snowballer's hands! The first contact with the snow makes the hand terribly cold; for the small arteries are driven thereby into firm contraction, and the nerve-endings of the finger tips feel the low temperature very keenly. But, as the snowballer perseveres, his hands commence to glow; the blood-vessels have become secondarily dilated, and the rush of warm arterial blood is felt agreeably by the peripheral nerve-endings. This is the plan to adopt with cold feet. They should be dipped in cold water for a brief period; often just to immerse them and no more, is sufficient; and then they should be rubbed with a pair of hair flesh-gloves, or a rough Turkish towel till they glow, immediately before getting into bed. After this a hot-water bottle will be successful enough in maintaining the temperature of the feet, though without this preliminary it is impotent to do so. Disagreeable as the plan at first sight may appear, it is efficient; and those who have once fairly tried it continue it, and find that they have put an end to their bad nights and cold feet. Pills, potions, lozenges, "night-caps," all narcotics, fail to enable the sufferer to woo sleep successfully; get rid of the cold feet, and then sleep will come of itself.—*Phrenological Journal.*

Milk Beer.

This new article of diet, said to be largely used in France for medicinal purposes, has lately been patented in this country by Edward Kokosinski, of Paris.

"The object of my invention," he says in his patent, "is to manufacture a beer which will possess special nutritive and hygienic qualities; and this object I attain by using whey in place of the water usually used in the manufacture of ordinary beer, as more fully described hereinafter.

"To make my improved beer, or milk beer, I use the following proportion of ingredients, namely, 33 kilogrammes of malt, 150 liters of whey, and 60 grammes of hops, preferably Bohemian hops.

"The whey should be freshly prepared, and be free from lactic fermentation and lactic acid.

"In brewing, a thick wort is used, and the fermentation is conducted at a low temperature, the steps of the brewing process being otherwise the same as in brewing ordinary beer. A brewing of the above quantities of materials will produce about a hectoliter of my improved beer.

"The use of whey in place of the water in ordinary beer results in imparting to the beer a greater quantity of albuminous matter and salts, which the milk contains, and which are identical with the salts of the blood, and thus renders the beer very nutritious.

"If desired, medicines such as quinine, tar, iron, etc., may be incorporated in the milk beer during its manufacture."

Comparative Mortality of Rich and Poor.—The most accurate statistics ever compiled on this subject are from the pen of C. Ansell, Jr., published in 1874. The author collected information concerning 48,044 children of the well-to-do classes in England and Wales, including members of the legal, clerical and medical professions, as well as that of the nobility and gentry. He found, from these inquiries, that in the first year of life, only 80.45 per 1,000 deaths occurred among the infants of the easy classes in that country, as against 149.49 among the children of the general population; but among the latter class the percentage went up to 240 in cities like Manchester and Liverpool, and as high as 300 in the poorer quarters of our cities, and in Berlin actually 500. From one to five years of age, 46.84 children of the upper classes die of 1,000 born, and as many as 113.69 in the general population. During the remainder of early youth from 5 to 20, the difference is not marked; but 65.47 per 1,000 deaths occur among the richer classes, as against 74.04 in the general public. Between 20 and 40 there die among the richer classes, 125 per 1,000, and 124 among the general population; and between 40 and 60 there die 147 per 1,000 among the rich, against 168 among the general population.

Theory of Life.—The late Prof. Faraday, adopted the theory that the natural age of man is 100 years. The duration of life he believed to be measured by the time of growth. In the camel the union takes place at eight, the horse at five, in the lion at four, in the dog at two, in the rabbit at one. The natural termination is five removes from these several points. Man being 20 years in growing lives 5 times 20 years—that is, 100; the camel is eight years in growing, and lives 40 years; and so with other animals. The man who does not die of sickness lives everywhere from 80 to 100 years. The professor divides life into equal halves—growth and decline—and these into infancy, youth, virility and age. Infancy extends to the twentieth year, youth to the fiftieth, because it is in this period the tissues become firm, virility from 50 to 75, during which the organism remains complete, and at 75 old age commences to last a longer or shorter time as the diminution of reserved forces is hastened or retarded.

The Use of the Right Hand.—The superior training of the right hand in the affairs of life is the heritage of ages. There are many operations which require the use of but one hand; and it seems but natural that in process of time that one should have taken the lead in their performance, and the tendency has been transmitted. Children generally show a disposition to use the right hand more than the left. We agree with you that we should be able to use both hands with equal facility. Some men do appear to be ambidexterous. There are anatomists who claim that the left hemisphere of the brain has a controlling influence in mental life, and for that reason the right side of the body is more exercised than the left. It is true that one hemisphere is more exercised than the other, and it is usually the left which dominates, but both are essential to completeness and harmony of mental operations.

Prevention of Boils.—A St. Petersburg physician, Dr. Sieven, commends a very simple treatment for the prevention of this painful form of abscess. He claims that if the skin be superficially scraped with a small knife, so that a drop or two of blood may be pressed through the epidermis as soon as the peculiar stabbing or pricking sensation and slight induration announce the commencement of the boil, it will not be further developed.

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The Week.

Our spring weatber has made its advent among us, and has given somewhat of an elasticity in business circles, which would undouhtedly he flourishing did not local causes intervene with the effect of retardation.

From all portions of the interior favorable reports are received in regard to the incoming crop, and it is believed that it will be the most abundant one that California has had for several years. More acres have been seeded to wheat and harley than in any previous season, and when the addition to the wealth of the State is realized from the crops, better and more prosperous times will exist, despite all extraneous influences.

The mining outlook holds also a rich promise for the future, and with its yield of bullion added to the farmers grain, it will make "assurance douhly sure" in the healtby financial condition of the coming season.

An important item of interest this week is Col. Mendell's suggestion to the Chief of Engineers in regard to the *debris* question. After summing up the question briefly he recommends certain remedial measures consisting in forming at certain places storage dams for controlling the *debris*. He concludes his report as follows: "It is, therefore, respectfully recommended that an appropriation of $250,000 he asked of Congress, to he expended during the present year in the construction of storage reservoirs for mining detritus in the trihutaries of the Sacramento river, and in a further study of this question." It is to he hoped that Col. Mendell's suggestion will be approved and a corps of competent engineers take hold of the matter in earnest.

In general news there has been no other item of importance worthy of especial notice. Everything has heen quiet; even our Legislators, succumhing to the ruling quietude, have forgotten to indulge in the rather noisy but futile quarrels, with which they varied the monotony of their arduous law-making duties.

Edison and Tailings.

Mr. Edison has found tims, while working at electrical appliances, to turn his attention a little towards mining operations, it hsing the fashion nowadays in the East to look after mines occasionally. A company has heen formed cslled the Edison Ore Milling Co., and works are to be erected at some point in Butts county very soon.

We do not prstend to know very much about Mr. Edison's process, or even exactly what he is going to try to do. Mr. G. W. Cummings, who was Superintendent and Manager of the Newton Hydraulic Dredging and Mining Co. a year or two ago, is supposed to he Mr. Edison's agent. Mr. Cummings, although he had a very large dredge huilt, did not make a success of his machine, which, whils it appeared to work very well, didn't get any gold, or, at least, not enough to pay the expenses. It is to he hoped he will he ahle to do hetter with the Edison process, whatever it may he. Mr. Cummings tells the Oroville *Register* that the new proposed works are to "mill hlsck sand." He also says that Major McLaughlin, and a corps of practical chemists to manage the works, will he here this month. The New York *Postal Card*, in referring to Major McLaughlin, says: "Major McLaughlin has heen quite ill since his return from the Pacific coast, with throat trouhle, hut has been ahle to get out again and is preparing to return to California, where he will carry out his contracts under Prof. Edison's improved method of hydraulic mining."

In addition to the ahove information we have the following dispatch from New York, dated March 4th: "Edison's spare time is spent in perfecting his process to ohtain gold from tailings. He has organized a company and ohtained at Virginia and Leadville, 50,000 tons. The process is secret, hut quicksilver is known to enter, as also oxide of lead, carhonate of soda, charcoal dust and powdered glass. He has so well satisfied a number of mining engineers and capitalists that his claim is well founded, that a company has already heen organized to work over tailings cast off at the furnaces of a great many miues. It was learned yesterday that this company have already contracted for and secured 50,000 tons of this product among the mining districts of Virginia and Leadville."

It is hard to judge from this dispatch whether the telegraph is trying to make a fool of Mr. Edison or Mr. Edison thinks the mining men here are a pack of fools. The "tailings cast off at the furnaces" is good, but we never before heard of any of that particular kind of tailings. Quicksilver, oxide of lead, carhonate of soda, charcoal dust aud powdered glass, ought to hring the gold out of a grindstone. It might withstand some of these, hut the powdered glass will fetch it sure. The rest of the process is secret, so we don't know the other parts of the compound.

Now Mr. Edison is a great inventor, and bas shown a great deal of genius, hut we think he has his hands pretty full with the electric light. The experiments he makes in his laboratory with ores or tailings will do him very little good when he comes to work them in bulk and on a large scale. We don't helieve a man with no knowledge of so important a suhject as tbe metallurgy of gold and silver, will ever accomplish much in working ores. We do not hear that Mr. Edison has associated with him any practical mining man—anyone who has had experience in working ores.

We all acknowledge that we are unable to save all there is in ore in our gold mines. These ores usually leave very little margin for profit, and if expensive machinery or expensive chemicals are used, it will not pay to try to get more than a certain percentage. Over that percentage it cost more than it comes to.

We have had dozens and dozens of Eastern men come to this coast who were going to revolutionize our means of working ores. Each one had a special process entirely different from those in vogue. Each one was confident; each one got up a company, and each one failed. People have no confidence in new processes, especially wben they are tried in secret. Processes which will not stand the test of chemical investigation or research, will not stand the test of practice.

While we have great admiration for the genius of Mr. Edison in his special hranch of inventive research, we have very little confidence in his teaching us anything new about working gold ores. If he is going to add a lot of machinery to our methods of working, he will find it will not do. If many chemicals are required, and repeated handling of the ore, while he may get more than we now do, he will find the increased expsnse will not meet with favor.

Perhaps it is unjust to say much ahout Mr. Edison's process, knowing nothing more ahout it than the extremely vague and nonsensical dispatches tell us; hut many people suppose that hecause Mr. Edison has turned his attention to the working of ores, the difficulties of the operation will surely he overcome. We have no such feeling, and think it best to keep cool until Mr. Edison tells us what he is going to do and how he is going to do it, hefore concluding that the long-looked-for prooess has come at last. Mr. Edison's 50,000 tons of tailings do not amount to a drop in the hucket compared with what he can get *if* he can work them. Whether he can or not remains to be seen.

Inventors and the Public.

The only dspartment of the Government which is self-sustaining is the Patent Office. In fact it even pays a profit. Yet the Govsrnment pockets the surplus, turns it over to some needy snd expensive depsrtmsnt, and is then niggardly in giving proper appropriations to run the Patent Office as it should he. The receipts of this department have to hs turned over to the U. S. Treasurer. He simply gives hack what is appropriated hy Congress, and this is never as much as is wanted. Ths husiness of the Patent Office for 1879 was as follows: The nnmher of applications for patents was 19,300, and the uumher of caveats filed was 2,674.

Total receipts of office.....	$703,146.79
Total expenditures of office.....	548,651.47
Receipts above expenditures.....	$154,495.32

The Commissioner of Patents in his annual report, gives these figures, and after comparing the receipts and expenditures of the year 1879 with those of 1877 and 1878, says that the decrease in the expenditures has heen enforced hy the reduction of the sppropriations so far as to seriously cripple the office and injure public interests. And he further says: "The constitutional provision which confers upon Congress power 'to promote the progress of science and useful arts hy securing, for limited times, to authors and inventors the exclusive right to their respective writings and discoveries' evidently imports, not that the inventors are hateful monopolists to be taxed hy the Government, hut that they are puhlic benefactors to he encouraged and rewarded. That this is the true theory the experience of our people with their patent system during the past century ahundantly proves, notwithstanding the exasperating annoyances which, in many cases, have resulted from patents improvideutly granted hy the office, unconsciously used hy their owners, and unwisely adjudicated hy the courts.

"This heing the constitutional theory, and also manifestly the just theory of the relation of the inventors to the public, it is alike unconstitutional and unjust to maintain in its present condition the legislation affecting inventors, hy imposing upou them in future years the special tax which amounted, as has heen shown, to the sum of $154,495.32 during the last year. It is the ohvious requirement of justice and of the Constitntion that one of two things be promptly done, viz.: Either that the fees exacted from inventors he reduced to the amount which the patent system costs the Government, or that the surplus he expended in improving the facilities for the prompt and thorough examination of their applications and for the effectual performauce of the other work wbich they pay the office to perform."

The Commissioner recommends the latter course, which all acquainted with the Patent Office will endorse.

Leaching Unroasted Ores.

Mr. M. B. Dodge of this city bas been making some experiments of late in leaching ores without roasting, and finds that he obtains a very high percentage. Certain of the ores he has been working are now heing roasted before leaching, and they only get 65% and 70%, while hy Mr. Dodge's method, without roasting, he gets from 80% to 93%.

Some ore from the Columbia mine, Bull Rnn, Nev., has heen tested in this manner under Mr. Dodge's instruction hy Kustel & Riotte. According to their certificate the sample contained, according to fire assay, per ton in silver $106.81. The same ore treated, without roasting, hy a leaching process, according to Mr. Dodge's directions, assayed, after leaching, $7.37. This result shows an extraction of silver equal to 92.76% of the fire assay.

As hefore stated, this ore, as it is worked at the mine, has heen roasted hefore leaching, and under those circnmstances they get from 65% to 70%.

In another case carbonate copper ores from Arizona were tried. The sample assayed hefore leaching $65.98 per ton. After leaching hy Mr. Dodge's method the ore assayed $15.56. This result shows that 80% of the silver was obtained hy leaching without prevous roasting.

Mr. Dodge claims no patent on his process, and simply makes certain changes in the method of leaching. He claims that his system of leaching will work silver ores in almost any state except the sulphides. Ores may he worked with very little cost for works. Where part of the ore is sulphide, that nart may he concentrated after leaching, and the sulphides shipped or roasted and leached separately. He says that even with low-grade ores he can treat them at a profit hy the means employed.

CONSIDERABLE excitement prevails over reported valuahle mineral discoveries near Rawhide Buttes, Wyoming, which are about 140 miles north of Cheyenne. Recent assays made in Denver of surface rock are said to average 125 ounces of silver and $8 in gold per ton. A regular stampede to the new discoveries on the part of those who can secure transportation is now progressing.

BILLS have been presented in both houses of Congress to confirm the Stratton survey of the Puehlo of San Francisco.

Copper Resources of the Pacific Coast.

Our aim in this article is to present to our readers as comprehensive a statement as spacs will permit on copper: its antiquity, its various qualities in commsrce, classification of its different orss, a brief historicsl rsview of its discovery on this coast, and its pressnt condition of development.

Copper was well known to the ancients, and it was in nse long before the Delugs, for Tubsl Cain we are told was "an instructor of every artificer in brass and iron." Brsss was a very indefinits term among the ancients; ths simple metal copper and all the different compounds into which it entered as a principsl ingredient, heing comprehended under the same name. Uncivilized tribes have heen discovered ou the northwest coast of America and elsewhere making use of copper implements; axes and other instruments of bronze have been found in tombs of the ancient inhahitants of Mexico and Peru, and from the latter country Humholdt took a chisel which Vauquelin ascertained to consist of .94 copper and .06 of tin. This alloy was so well forged that it had a specific grsvity of 8.815. The bronze of an ancient Grecian helmet was found on analysis to he copper alloyed with 18.5% of tin. An ancient dagger analyzed hy Heilm was found to contain about five parts of copper and one of tin; and other analyses of ancient weapons found in countries widely distant from each other have afforded much the same result.

Pure copper is of a reddish brown color, and of a high luster. It is one of the most ductile and malleable metals, and can he hammered or rolled into thin sheets or drawn into moderately fine wire. Its specific gravity when cast is 8.91, in wire 8.93, in sheets 8.95. Copper melts at a temperature of 1996° Fahr., or above the fusing point of silver and below that of gold. The usual

Impurities Occurring in the Copper of Commerce

Are iron, arsenic and silver—in small quantities almost invariahly; hismuth very frequently except in Russiau and Australian specimens; tin, antimony and sulphur occasionally, and lead almost invariahly in sbeet or holt copper, but not in cake coppsr; with nickel, cohslt and gold less frequently. The variety known in commerce as hest selected is very nearly pure; while tile copper and tough cake usually contain traces of arsenic, iron, sulphur, tin, nickel, etc. The effect of iron is to render the copper harder and paler in color; sulphur and antimony likewise harden copper, make it grayer in color and impair its malleability and tenacity. Copper containing only 10 oz. of antimony per ton is stated hy Dr. Miller to be quite unfit for use in the preparation of hrass intended for rolling. Arsenic in small quantities hardens tbe metal, hut does not impair its malleahility to the same extent as antimony. Small qsantities of lead are occasionally added to copper intended for rolling, hut the addition of only small quantities—one to two per cent.—of this metal, renders copper nnfit for the manufacture of hrass plate and wire.

Best selected is the name applied to the puror varieties of commercial copper, as required in the manufacture of hrass, for sheets and wire, such metal being especially freed from tin, arsenic, iron and sulphur. Russian copper generally contains traces of iron, hut in other resnects is exceedingly pure. The native metal occurring in the neighhorhood of Lake Superior is usually very free from impurities, hut occasionally specimeus yield .0003% of silver. Chilean copper, as imported into this country, occurs in the form of bars weighing ahout 200 pounds each, having a composition analogous to the Welsh "pimple" or "hlister" copper, and which accordingly requires to be refined, or mayhe hoth roasted and refined, hefore it is ready for general use. The *rosette*, or Japan copper, is a variety of commercial copper, the surface of which presents a peculiar red color. It contains a considerahle amonnt of red oxide, and has a dull, red-short fracture. It requires refining hefore it can he hammered or rolled. Bean-shot and feather-shot copper are varieties ohtained in the form of small globules and flakes respectively, convenient for the hrass founder's use, and prepared hy running the melted copper through a perforated ladle into hot water for the production of hean-shot, or into cold water if feather-shot he desired. Cement copper is the name applied to the almost chemically pnre variety of copper ohtained hy the prccipitation process as conducted at Anglesea (North Wales), Hungary, and even until lately at Melrose.

Ores of Copper.

Copper occurs very ahundantly, and in a variety of forms. The ores of this metal occur in rocks of almost all ages, hut most abundantly in the Lias and Permian formation; yet in all copper veins, oxides, more or less green, are found on the surface, which, in connection with other marks, form a sure indication of the presence of copper ore.

Native conper is found in isolated masses, sometimes of considerahle size, and also in heds, veins, in solid rocks and imhedded in loose soil; it is distrihuted over the whole surface of the globe, hut nowhere is it found more generally and in larger masses than in the United States. Masses of native copper of 80 tons weight have heen excavated in the Cliff mine at Lake Superior; it occurs in trap or sandstone rock in

the form of injected veins. The origin of the metal appears to be from veins whose ores have been reduced by the heat of the volcanic rocks. But the chief sources of copper are the following ores:

1. Gray sulphide of copper, copper glance or red-white and purple copper, are sulphides of copper occurring largely in this State, in Nevada and also in Arizona and elsewhere, and it is profitably mined in many localities. Copper glance when pure consists of 77.7 copper, .91 iron, 20 sulphur and some silica.

2. Gray copper ore or fahlerz is a steel-gray or iron black, brittle mineral, occurring both massive and crystallized in cubic forms. The composition of this ore varies greatly, but on an average it contains from 25% to 40% of copper, from 20% to 30% of sulphur and nearly as much antimony.

3. Copper pyrites or yellow copper ore, a compound of copper, sulphur and iron; it forms the ore from which about five-sixths of the copper produced in Great Britain is obtained; this ore is of a brass-yellow color, distinguished from iron pyrites—which it greatly resembles—by its inferior hardness.

4. Blue carbonate of copper contains 55.16% of copper.

5. Green carbonate of copper or malachite contains 57% of copper, and it is distinguished by its fine, emerald-green color, with a luster inclining to resinous. It occurs along with the blue carbonates almost in every country.

6. The black oxide contains, when pure, 79.8% of copper, but it is frequently very impure.

7. The red oxide contains 88.78%, and it is found massive or granular, frequently iron-gray on its surface, but always affording its characteristic reddish-brown streak.

The existence of copper on the Pacific coast was well known for many years before California became a State. The ores of this metal are known to have been found in Mexico at various points, in great abundance, for centuries past. But the first officially recorded

Discovery of Copper in California

Since it became a State was made by Dr. J. B. Trask, who acted as State Geologist from 1851 till 1854. During that time, in the course of his travels, he found copper in nearly every county of the State, the first discovery, however, being made near a place then called Round Tent, in Nevada county. But very little attention was paid to it until the summer of 1855, when public attention was again called to the fact of the existence of copper in this State by the discovery of a body of beautiful ore at Hope Valley, Amador county, by an old prospector known as Uncle Billy Rodgers. About the same time a party of prospectors in El Dorado county found a large body of green and blue carbonates on the side of a hill a few miles from Placerville, and, attracted by the brilliant colors of these minerals, collected several sacks full of them and sent them to San Francisco, where, by assay, they were found to contain 40% of copper, and worth about $140 per ton; but these discoveries were soon forgotten in the more exciting search for gold, which occupied almost everybody's attention at that time, and the *now* great copper resources of the Pacific coast remained without an effort being made for their development till November, 1860, when Mr. Hiram Hughes, while prospecting for silver among the foothills that margin the Valley of San Joaquin, discovered—without being aware of the fact—the gossan or cap of a copper lode, on what is now known as Quail Hill No. 1—an insignificant mound among the gopher hills in the southwestern portion of Calaveras county, about 35 miles southeast from Stockton. This gossan, which presented much the appearance of a body of iron rust, held together by a frame-work of quartz, was found to be very rich in gold, and it was for this metal only that Hughes worked his claim.

Soon after, while making further explorations for "iron rust," he discovered the croppings of what is now known as the Napoleon mine, about three miles southwest of his first discovery. As there was less gold, and considerable of what was then to him an unknown mineral, in this place, he sent a lot of the ore to San Francisco, where it was pronounced 30% copper ore and worth about $120 per ton. As soon as this became known, there was a great excitement, and everybody began prospecting for "iron rust," and as the indications of copper were to be found almost at any point of the Gopher hills, hundreds of claims were speedily marked out and recorded. But as none of these mines except the Napoleon ever produced much marketable ore, work on all of them very soon ceased.

Notwithstanding the great amount of prospecting that followed Hughes' discovery, it was not until some time in June, 1861, that the lode, on which the mines at Copperopolis are located, was discovered, though it was only about six miles from the Napoleon, and the locators of the Union, Keystone and other mines were all old residents in the vicinity. Many interesting and instructive facts might be here introduced to exhibit the ignorance of the parties who first discovered these important mines as to the value of their property, but the limits of this article would not permit.

Before the close of the year 1861, also, a well-defined belt of copper ore, containing several distinct lodes, was traced and partially developed, from a point about 30 miles north of Los Angeles, at La Soledad, through Mariposa, Merced, Fresno, Tuolumne, Stanislaus, El Dorado, Placer, Nevada, Yuba, Trinity, Sierra, Plumas and Shasta counties, to a point about 20 miles west of the town of Yreka, in Siskiyou county, where it enters the State of Oregon in a northern spur of the Siskiyou mountains, the most western branch of the Sierra Nevadas. The results of all these discoveries, were the location of thousands of claims, some of them of considerable importance, in nearly every county in the State, and the incorporation of a countless number of copper mining companies, and for a while the development of the copper resources of the Pacific coast was prosecuted with great zeal. But, however, a few years' experience taught those most deeply interested in the business, that with unskilled management and expensive labor, uncertain and costly transportation, and a great distance from a market for the final disposal of the ore, it is unprofitable to work the richest and most extensive copper deposit in the world.

Copper Smelting Works.

Numerous plants have been proposed and tested for the purpose of smelting and concentrating the copper ores found on this coast, none of which, however, have been entirely successful, though several of them have been partially so. A detailed description of all these various processes and of the furnaces and apparatus used, while it might be both interesting and instructive, would be out of place in this article.

The first copper smelting works—which were of an experimental character—were erected at Antioch on the bank of the San Joaquin river, near the base of Mount Diablo, for the purpose of testing the adaptability of the coal obtained in that vicinity for smelting purposes.

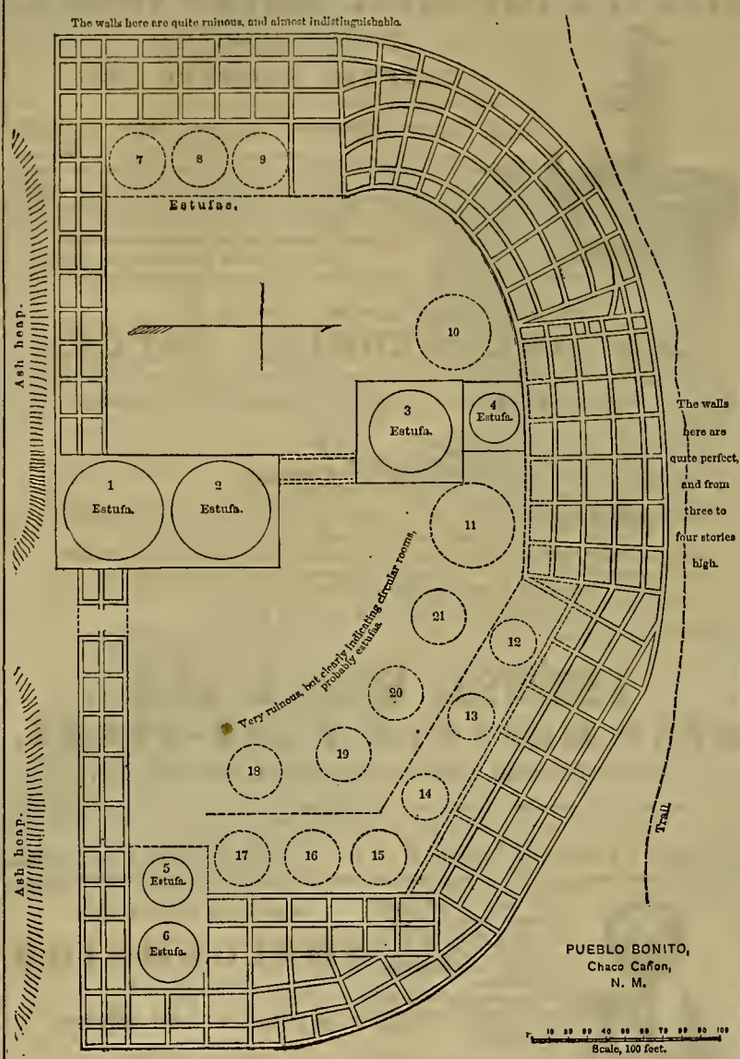
Other smelting works were erected at the Union mine at Copperopolis on a more extended scale than those at Antioch. The smelting works at the Cosmopolitan mine, at Genesee Valley, Plumas county, are constructed on the plan described by Piggot in his work on copper. Several other concentrating, leaching and smelting works have been erected of a novel and very economical and useful character on this coast, the different processes of which we shall probably describe in a future article. Some of these we have described lately.

The present condition of copper development on this coast, as well as on all the Pacific slope, is not so encouraging as it ought to be; but the absence of any correctly compiled statistics, the indisposition of influential parties to give any information, and the unreliable nature of most of the articles which from time to time appear in the local papers, as well as many minor impediments, render it exceedingly difficult to convey a clear idea of the condition and actual value of these important resources.

There are now thousands and hundreds of thousands of tons of copper ore lying idle, and have been so for several years, on the dumps of the various claims in this State as well as in Nevada, waiting for a remunerative system of treatment. There are indeed some hundreds of tons of sulphides which we know of in San Joaquin valley, that assay at an average of 12%, which are too low-grade to be shipped to Swansea, and therefore have no market. There are oxides, blue and green carbonates, not a long distance from this city, 14 different samples of which, assayed not long since, contained an average of 38% of copper. A vast amount of ores of this quality are now lying idle on the dumps, and command no market. There are indeed mountains of its resources locked up in our rocks and hills, waiting for the golden key of the capitalist to open them. There are here all the facilities in the world for this vast wealth to be developed: a number of claims already opened and in good working order, plenty of men in want of employment, and ores in abundance and easy to work.

Work on Mining Claims.

We gave two weeks ago the provisions of the amendments to Sections 2324 and 2325 of the Revised Statutes of the United States, relating to the date of work on mining claims, and allowing agents to make affidavits for our residents.


The walls here are quite ruinous, and almost indistinguishable.
Estufas.
Ash heap.
Ash heap.
Very ruinous, but clearly indicating circular rooms, probably estufas.
The walls here are quite perfect, and from three to four stories high.
Trail
PUEBLO BONITO,
Chaco Cañon,
N. M.
Scale, 100 feet.

Under the provision of the law, as it has been standing on the statute books, the date within which it was necessary to do the work on a claim was a matter of some doubt. For instance, a man would locate a claim June 1st, and perform his expenditures on the following June 1st, or just before the year was up. The work done at that time, therefore, could hold the claim till the end of the next year, since he might come at any time to do the work for that year. A few days' work would therefore hold the claim two years. In fact, the Section presenting annual expenditures was so vague that it was necessary to amend it. The amendment is specific and clear, and there is no misunderstanding it at all. The following words are added to the law as it stands: "*Provided*, That the period within which the work required to be done annually on all unpatented mineral claims, shall commence on the 1st day of January succeeding the date of location of such claim, and this Section shall apply to all claims located since the 10th day of May, A. D. 1872." This is plain and to the point. The year runs from January to January, and not from date of location to same date in next year.

IRON ore is being shipped from the McCloud river, near the United States Fishery, to San Francisco.

Aztec Ruins in New Mexico.

We have in recent numbers given illustrations and descriptions of the ruined Aztec towns in New Mexico. These ruins are highly interesting, as showing the state of civilization of this ancient race. The ruins of Pueblo Bonito, illustrated herewith, are the largest, and, in some respects, the most remarkable of all. Its length is 544 feet, and its width 314 feet. By referring to the plan it will be seen that it only roughly approximates the usual rectangular shape. The two side wings are parallel with each other, and at right angles with the front wall. The left-hand wing consists of three rows of rooms, 8 in each row, 12 to 15 feet wide and from 12 to 20 feet in length. The outer walls are entirely demolished, but some of the interior walls reach to the top of the second story. In front of this wing and facing the court are the remains of what was probably three circular, partially subterranean rooms, probably *estufas*. The section adjoining this wing is in the shape of an almost perfect quarter-circle, and consists of five tiers of rooms, with nine rooms in each.

The walls are standing quite generally as high as the second story. The middle section is the most ruinous of all, but the great depth of the *debris* which covers several perfect rooms indicates that it originally possessed an equal hight with the adjoining walls. The outer wall thus far is entirely ruined, hardly a stone remaining in place, but in the section that lies between the central line of *estufas* and the right-hand wing it rises up to the fourth story, and is in a remarkably well-preserved condition. Several of the interior parallel and transverse walls are also standing fully 30 feet high. Many of the *vigas*, which are in excellent preservation, still retain their places and protect a number of rooms on the first floor. The outer wall of the east wing is in fair preservation, while the interior walls are in excellent order for at least two stories; the apartments in this and in the adjoining section are of unequal size, and the walls of the ground-floor are of a firm massiveness that has preserved them remarkably well. Within this wing are two *estufas*, one of which came up with and formed a portion of the second story. Across the front of the court there are two tiers of rooms about 25 feet in width, their fallen walls making a mound of *debris* 5 to 8 feet in depth, indicating that they were of considerable hight. Every transverse wall could be easily distinguished. Interrupting this about midway is a solid parallelogram 65 by 115 feet in dimensions, in which are two *estufas*, each 50 feet in diameter.

Legislative Matters.

Since our last issue, very little of interest to miners and mechanics has transpired at Sacramento. The Legislature has many knotty problems before it, and a good deal of its time is taken up with choking off special and crude legislation. Bills which should never see the light are introduced, considered, argued and debated at a cost of time and money, which must be aggravating to those members who are working with intelligence and good faith.

An act has been introduced to pay Jamee W. Marshall $1,200 for services rendered in the discovery of gold in California.

An attempt was made this week to reconsider the action on the Boiler Inspector bill, but it was voted down.

The famous Revenue and Taxation bill finally passed the Senate this week by a vote of 24 to 15. It now rests with the Governor.

Maybell has introduced a bill providing for an income tax as follows: Income of $2,000 and less than $3,000, 1%; $3,000 and less than $4,000, 1½%; $4,000 and less than $5,000, 2%; $5,000 and less than $6,000, 3%; $6,000 and less than $7,000, 4%; $7,000 and less than $8,000, 5%; $8,000 and less than $9,000, 6%; $9,000 and less than $10,000, 7%. Over $10,000, 10% upon excess of increase over $2,000.

The bill providing that the several agricultural societies in the State shall be State institutions, in order to bring them within the provisions of the Constitution, and enable them to receive appropriations, has been amended so as to meet an objection which had been urged against it. It was found that the bill as drawn, allowing the Governor to appoint Directors, would substantially make them political institutions. As amended the bill confines the appointment of Directors by the Governor to persons recommended by the members of the societies.

"THE 'TRUE' AND 'FALSE' WORKMAN."—Freeman Lovell, of San Francisco, will lecture on the above subject in the popular course of free lectures in Oakland, Sunday evening, March 14th. Few who listened to Mr. Lovell's recent able lecture on "Balance Wheels," will fail to attend.

IT appears that the iron piers built during last spring at Coney Island and Long Branch are proving that they are fully capable of resisting the storms raging during the winter on our coasts. The success thus obtained will no doubt largely encourage the construction of similar works.

THE EMPIRE MINE CLOSED.—Owing to disagreement between the employees and owners of the Empire coal mine, work has been suspended and the mine closed for an indefinite period. The facts of the case are these: The owners agreed to pay the miners one dollar per yard for cutting coal at the time the mine was first worked. This was and is considered good pay, and miners working full time could make handsome wages at this price. Business being dull, something over a year ago, Mr. Belshaw, the manager, told the coal cutters that, as they were employed only a portion of the time, 8 to 10 days in the month, he would furnish boys to dump the cars, taking coal from the breasts to the gangway. This was a gratuitous offer on the part of Mr. Belshaw and was made through charitable feelings only. Since then he has continued to furnish this extra help until a few days since, when orders were given that hereafter, as the miners were now employed from 15 to 20 days in the month, they must furnish coal in the gangways for one dollar per yard. They demanded as a right that which was benevolently accorded them, namely, the services of the boys to assist in dumping the coal. The next morning they refused to go to work. Messrs. Belshaw and Rouse called a meeting of the miners and fully explained the situation of affairs, and stated exactly what business had been done since opening the mine. The miners held a subsequent meeting and instructed their committee to report that they still adhered to their determination not to go to work, whereupon Mr. Belshaw gave orders to pay off the men and suspend operations. By thus closing the mine 125 men are thrown out of employment. It affects our merchants and business men materially, as the company paid from $8,000 to $10,000 monthly to the employees. It is to be hoped there may yet be an amicable arrangement made and work go on, but there is no indication that operations will be resumed at present.—*Antioch Ledger.*

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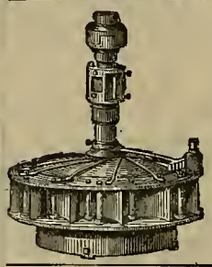

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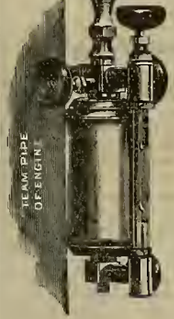

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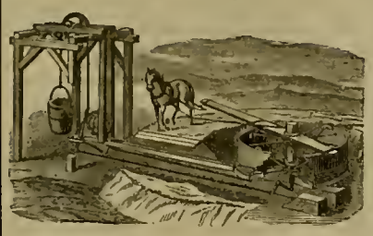

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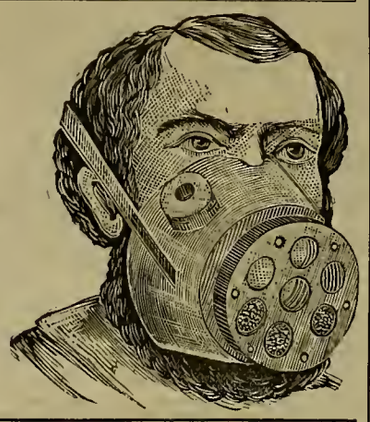

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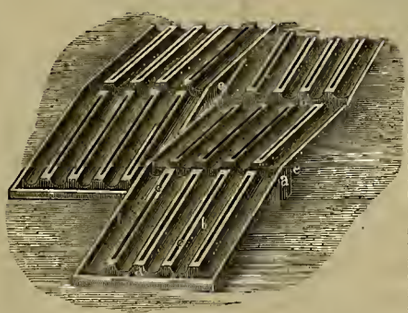

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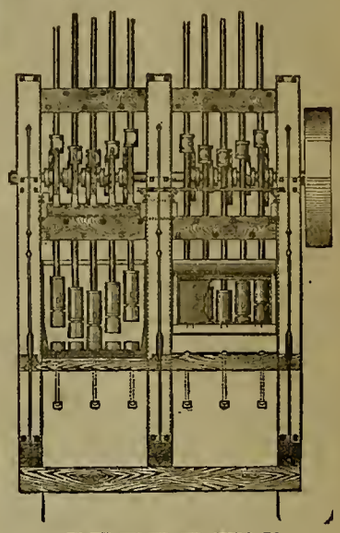

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Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Moeser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

AN ENGINEER,

Favorably known in the East, desirous of settling in California, seeks position as Superintendent or Chief Draughtsman. Competent to design Stationary, Marine, Locomotive, Mill Work, Sugar and Hydraulic Machinery. Speaks Spanish. Unexceptional references. Address EXPERT, this office.

CONTINUED FROM PAGE 165.

SANTA CATARINAS ITEMS.—The American Flag has reached a depth of 63 ft in a well-defined three-ft ledge of high-grade chlorides and carbonates. It is a true fissure vein. The Pilot struck a rich body of black sulphuret ore showing free gold and native silver. The Blood Sucker is opening up large bodies of ore, both in gold and silver. Large boulders of ore on their dump are no uncommon things to see, which fairly bristle with "chispas" of bright yellow metal.

SILVER DISTRICT ITEMS.—Yuma *Sentinel*, Mar. 6: The Melissa has a tunnel of 91 ft. A shaft has been sunk in it 34 ft. They have 70 tons of first and second-class ore on the dump. The ore assays very high in silver and lead. This ledge joins the Rover on the south. On the Amelia an extension of the Rover on the north a 200-ft shaft will be commenced. The Nellie Kenyon has been bonded for $10,000. The Black Rock is down 130 ft in metal at the bottom that will average $200 per ton. An assay shows a value of $252.90 per ton. The Iron Cap crosscut at 200 ft is in 10 ft, on ore, and still going.

SALERO CAMP ITEMS —Tucson *Record*, Feb. 28: The Lost has a shaft of 100 ft in depth. At 50 ft levels east and west are being run, in free milling ore, chlorides and horn silver, running as high as $4,000 and $5,000. It will average on the ore streak something over $100. The Red Cloud shows a fine body of free milling chloride ore from the surface down to the present depth, 85 ft. The general character of ore in this district is chlorides, copper, silver glance, horn silver and some carrying a small percentage of galena. The formation is syenite and porphyry, the ledges sometimes being capped with manganese.

COLORADO.

TROPIC.—Georgetown *Courier*, Feb. 26: The last carload shipped milled $142 per ton, a part of it being from the shaft and the remainder from the upper workings. The main shaft is now 155 ft deep, and 65 ft below the level. A new level was started from the bottom both east and west. The shaft shows a continuous ore vein from this level down, which increases both in size and value with depth.

WHITE.—Since last August this mine has paid all expenses with one-half the product. The Cleary adit is now 180 ft long. A fine body of ore was opened at the breast from 6 to 12 inches in thickness and of a high grade. The Swartz shaft has been sunk to a depth of 170 ft. Above the first level, 55 ft from the surface, a vein of two ft in thickness, one-fourth of which is a smelting product. The level has been driven 100 ft towards the Boulder Nest and two-thirds of the distance has been worked out to the surface. The first-class ore from this shaft mills from 150 to 200 ounces, and the concentrations about 90 ounces per ton.

FREE AMERICA.—The shaft is 552 ft in depth; the eighth level, at 540 ft, is started, there being a three-inch vein of lead ore to commence on and a vein 15 inches in thickness, with galena in sufficient quantities to make it worth from 50 to 70 ounces per ton. This can be seen in all the workings below the third level, a depth of over 300 ft, and as far east and west as the levels have been run. The seventh level, 60 ft above, is being driven east and west, the east level being 70 ft and the west 25 ft in length. The galena in the quartz vein, which is assorted for a smelting product, mills from 200 to 300 ounces per ton. The sixth level, at a depth of 430 ft, has been opened west of the shaft 50 ft; and the fifth level, 50 ft above, has been opened east 50 ft. The fourth level is 270 ft from the surface, and has been opened easterly 170 ft. The vein of milling ore in the back stope is 12 inches thick. From one-fourth to one-third of the vein is a smelting product that mills from 200 to 300 ounces in silver per ton, the remainder being a concentrating ore that millsfrom 60 to 80 ounces. The second level is 150 ft from the surface, where a winze is sunk about 50 ft west of the shaft. It is 30 ft in depth, and shows a vein of smelting ore from top to bottom that will average six inches in thickness, and mills, when dressed, from 200 to 300 ounces per ton.

MONTANA.

GAGNON.—Butte *Miner*, Mar. 2: During the past week important developments have been made. Six weeks ago the 150 level was at the foot of the main shaft, which is now 90 ft deeper on the north side of the ledge, which a crosscut has proved to be of a very superior character. The crosscut extends five ft into the vein from which ore is taken assaying 300 ounces in silver per ton, and carrying a high percentage of copper. There is a 20-ft vein of $300 rock exposed. From a point distant 20 ft from the shaft a level has been started west 75 ft below the No. 3 level.

ALICE.—About 50 tons of ore per day are being extracted, ranging in value from $60 to $80.

MOOSE.—Is producing excellent ore. From the incline shaft, in which a four-ft vein of ore extends from top to bottom, a distance of 42 ft, ore has been taken which assayed $191.97 for the first-class or base ore, and $92.34 for the second-class ore, which is free milling. About 30 ft east of the discovery shaft a shaft has been sunk 80 ft and a crosscut commenced to tap the ledge. The Moose is situated a few hundred ft south of the eastern end of the Magna Charter.

MAGNA CHARTER.—The contractors have started a crosscut from the footwall of the ledge to connect with shaft No. 3, distant about 1,350 ft east from the mouth of the tunnel.

GRAY ROCK.—Is yielding about 12 tons of ore daily. On the 80 level a contract has been let for an extension of 100 ft. Seven ft of ore is being taken out on the hanging wall, though the vein is much wider than seven ft. This level is 20 ft below the water line, and some of the base ore extracted resembles that taken from the Alice on the 500 level. It is yielding free ore, of which a vast amount is in sight in the upper workings.

HIGH ORE.—The shaft is 115 ft deep, from which two levels have been run. The first, which, from a point 70 ft down, runs east 150 ft, has yielded a vast amount of ore, and has as yet a great deal in sight. Forty-five ft further down the second level has been run, and extends both ways from the shaft, with a total length of 100 ft, showing a continuous body of free-milling ore, averaging about 30 ounces. The level is in ore on top, sides and bottom. In the east end a crosscut was run 18 ft, proving the ore body to be as wide as that. About 50 ft east of the main incline a wing shaft has been run and the ore stoped out, with a great deal to be extracted. Since last May the property has yielded 1,700 tons of ore.

BELL.—The work is prosecuted through the middle one of the three shafts. Free ore has been taken out of the first level at a depth of 40 ft, and extends east 40 ft and west 100 ft. The second level, 70 ft below, is being pushed east and west. In the west level the ore body is five ft wide. The ore is rich in silver and copper, carrying 80 ounces of the former and 35% of the latter. In the west or main shaft, which has a depth of 145 ft, the vein carries a high percentage of copper and assays well in silver. Thirty tons contained 47% copper and 40 ounces in silver; 1,500 tons having the average value of $60. One hundred and fifty ft south another ledge is worked, on which two shafts are sunk. The east shaft is down 80 ft and shows ore from 20 to 30 ft in thickness, which assays from 12 to 140 ounces in silver. The average value is 25 ounces, and 600 tons have been worked. In the east shaft, at a depth of 70 ft, three ft of ore of a somewhat inferior grade has been opened up.

GLENDALE.—The furnace is turning out 1,500 ounces of silver per day.

SILVER BELLE.—Helena *Independent*, Feb. 26: Is located at the head of Poor Man gulch, 18 miles from Lincoln. The ore assayed 201 ounces of silver and $126 in gold to the ton, and there is a five and one-half ft vein of that kind of rock.

PENOBSCOT.—Seven thousand dollars gold bullion is the result of two weeks' run upon the ore.

MOUNT PLEASANT.—Has an eight-ft vein carrying gold and silver in large quantities.

OREGON.

MINING NOTES.—Jacksonville *Times*, Feb. 27: Johnson & Allison, on Jackson creek, are busily at work with a good supply of water. It is quite probable that much prospecting for quartz mines will be done next summer. Eckelson & Chappel and Gin Lin are running day and night, as also are most of the other hydraulic claims. Superintendent Lackland, of the Palmer creek diggings, will make a clean-up this week, and we expect to hear a good report from him. Beck Bros. have their claim on Applegate in good shape this season, and expect to make a profitable run. They are busily engaged in ground-sluicing. Thomas P. Kahler picked up several small nuggets in the Fort Lane diggings the other day, one of which weighed $17. As the bedrock is neared the prospects become better and nuggets more numerous. Mr. Benner proposes sinking down 50 ft further on the Ralls quartz ledge in the Willow Springs district this summer, which will make the prospect shaft 100 ft deep. He is of the opinion that it will prove well-defined and valuable.

UTAH.

SUPERIOR.—Salt Lake *Tribune*, Mar. 5: Has drifted 125 ft through ore without discovering hanging or footwall. This is undoubtedly the mother gold vein of the Wasatch.

CRAMPION.—Adjoining the Horn Silver, and promising to develop into as good a property, was sold to Chicago parties on Monday, the price paid being $250,000.

PARK ITEMS.—*Mining Record*, Feb. 28: Prospecting for lead ore on Scott hill is being pushed ahead, that good fluxing material may be ready when the smelter is completed. The work of grading for the smelter has been pushed as fast as the weather would permit. Work on the Silver Chief, on Bald mountain, the claim in contest with the Wasatch, will be commenced as soon as the snow settles. Prospectors are making their calculations for as early a start in the spring as possible. Even now, with the snow from 5 to 20 ft deep, locations are occasionally made by digging through the snow, where ledges were known to exist before snow fell. The coal prospect in Cedar creek is about seven miles from Heber. It was discovered by George M. Makin, an old and thorough coal prospector, and every indication is there for six ft of coal. In the Ontario work has been suspended on account of the mill shutting down. Sinking for the 700 level will be continued in the new shaft; 40 ft further will complete the work.

EMPIRE.—Has just reached its 400 level. From the 300 level down the shaft has three compartments well timbered. Above the 200 and 300 levels the work of raising on the incompleted compartment will progress rapidly. On the 100 and 200 levels the vein has been reached by a drift, and followed east and west a considerable distance. On the 300 level the drift has not yet reached the vein. At the 400 level the largest station in the district will be made. Its dimensions will be 30 ft long, 20 ft wide and 12 ft high. The vein continues through the workings in the west end of the drift on the 100 level; it has pinched from several ft in width to 10 inches, the assay value being much higher than in the east end. On the 200 level, immediately below the pinch in the west end of the 100 level, the vein is 15 to 17 ft wide, with good pay ore of four ft. The average width of the vein is about six ft, and the ore has averaged $35. Some ore has been taken out that will go $500 and $1,000. In the face of the drift running east on the 200 level, work has been suspended, as there is as yet no ore house. The ore is too good to be removed until a place for storing it has been erected.

FAIRVIEW.—Is sinking a 200-ft incline on the vein. The vein has been stripped, exposing ore all the way down. Fifteen samples from the bottom of the shaft, in eight-ft ore, assay $23.33½ in gold and silver, there being $3 in gold. A third assay of ore from the same depth brings the average of $26.50.

UTAH MARBLE.—There are 20 tons of marble at the mill and 40 tons already for transportation from the quarry to the mill. The quarry shows an inexhaustible supply of marble, and all over the mountain it crops out so plainly that the layers and seams in many places are visible. There is scarcely any difficulty encountered in quarrying it. Its clearness and whiteness when polished will create a great demand for it.

WHITE PINE GULCH ITEMS.—The Friday tunnel, situated northeast of the Jones, is being driven to cut the vein at a depth of 400 ft. The Mountain Top mine will run a 400-ft tunnel, cutting the ledge 500 ft deep. The Great Basin tunnel has been driven 200 ft this winter, and 100 ft further will strike a rich body of ore. The Great Basin is the first extension east of the White Pine mine. The tunnel is 1,200 ft lower than the present working shaft of the White Pine, its mouth being 1,200 ft from the end stakes of the latter mine. It will thus be able to work the two mines for several years without machinery. The White Pine shaft is down nearly 300 ft. A winze will be raised from the 300 level to the surface for ventilation, and manways will be made for escape in case of danger.

News in Brief.

IN Van, Armenia, 52 persons have died of starvation.

DE LESSEPS has left Washington for San Francisco.

PARIS is to present Prof. Nordenskjold with a gold medal.

THE cold weather still prevails in upper British Columbia.

THE Vancouver Coal company's miners at Nanaimo are on a strike.

JULIUS BEER, proprietor of the London *Sunday Observer*, is dead.

THREE HUNDRED amnestied communists have arrived at Brest, France.

THE winter wheat crop in portions of Wisconsin is pronounced a failure.

THE Weston-O'Leary walking match began in this city on Monday last.

FOUR Mussulman villages have been burned by order of a Russian officer.

THE negotiations with the Ute Indians have been concluded at Washington.

COUNTERFEIT $100 bills on several Eastern national banks are in circulation.

THE death of Commodore Isaiah Hanscom, U. S. N., is announced from Washington.

RICH mineral discoveries are reported near Rawhide Buttes, 140 miles from Cheyenne.

THE return of Hartmann, the nihilist, to Russia, is refused by the French government.

CHARLES COLBY was hanged at Santa Cruz Friday last for the murder of Harry Williams.

THE death of ex-Congressman, George W. Kettridge is announced from Newmarket, N. H.

THE Danforth Locomotive and Machine Works at Paterson, N. J., were recently destroyed by fire.

ROGER B. CONANT has been sentenced at Boston to seven years' imprisonment for embezzlement.

FOR insulting President Grevy and Waddington, a Paris newspaper has been fined 1,000 francs.

A STEAMSHIP from New York to Liverpool lost overboard seventy head of cattle on the voyage.

H. E. BROWN, one of the Mendocino outlaws, was found guilty at Ukiah on Saturday last of murder in the first degree.

THE would-be assassin of Gen. Mslikoff was executed at St. Petershurg in the presence of an immense concourss of people.

IN order to afford Bismarck relief from his arduous duties, Count Von Stalherg Wernigrod is to he appointed Prussian Premier.

A VIOLENT gale occurred in Ohio, Indiana and Kentucky Friday last, doing much damage to property and causing the loss of several lives.

IT is possible that a crack French regiment will visit this country on the occasion of the centennial celebration of the surrender of Yorktown.

THE Virginia Senate refused to pass the Riddleberger debt bill over the veto of the Governor—ayes, 19; noes, 16. Not the necessary two-thirds.

THE British Parliament was dissolved on Tuesday. In the House of Commons the Chancellor of the Exchequer said writs for the new elections will probably be issued on the 24th, the day after the House of Commons separates.

THE last number of the *Rocky Mountain Courier*, of Green River, Wy., gives an account of an active volcano near Brown's park. The crater is five feet in diameter, emitting sulphurous smoke, but there is no lava yet. The snow in the vicinity has been melted by the heat of the volcano.

IN the case of Clarke, elected Judge in Cincinnati, involving the constitutionality of the Federal election laws, the Court affirms the law is constitutional, and orders the prisoner remanded to the custody of the United States Marshal. Justice Field read a dissenting opinion in the case.

The Audiphone.

Inventive genius is becoming equal to all emergencies, and now it has come to pass that people are enabled to hear without ears.

Mr. Richard S. Rhodes, of Chicago, is the inventor of the "audiphone," an instrument that enables the deaf to hear through the medium of the teeth.

The audiphone resembles a fan, and is made

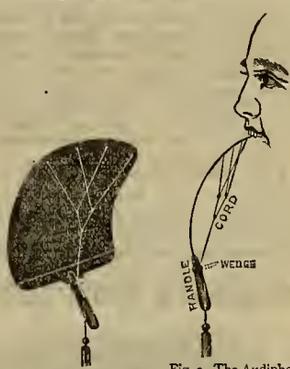

Fig. 2. The Audiphone in tension; the proper position for hearing.

Fig. 3. The Audiphone properly adjusted to the upper teeth; ready for use. (Side view.)

of carbonized rubber carefully polished, and by its flexibility it is sensitive to the slightest vibrations of sound waves, which, when in use, it gathers and conveys through the teeth and auditory nerve to the inner ear and the brain.

We witnessed this practical use of this remarkable instrument in the hands of a gentleman who is deharred from ordinary conversation without artificial aid, and no one would discover his deafness while he has the audiphone in position. It restores to the deaf the enjoyment of conversation, music and public entertainments—previously denied—and relieves the deaf ones friends of much annoyance in repetition and endeavors to made him hear what they say. Mr. H. E. Mathews, as agent for the sale of audiphones on this coast, will send the instrument free to any address on receipt of price, $10.

Address him at 606 Montgomery street, San Francisco, Cal., or call upon him and he will demonstrate the truth of the adags, that "Wonders never ceass."

Mining Location.

An important ruling upon the subject of mining locations has recently been given by Judge Bowen, of Colorado, in a Leadville case. The ruling touches upon the definition of the status of a discovery within the boundaries of a valid location. Judge Bowen says:

"A vein, ledge, lode or deposit of mineral-hearing rock in place being once discovered, and such having afterwards been followed up by a valid location and record of a lode-claim based upon such discovery, the land, earth or mineral within the limits of such location ceases to be unappropriated public domain of the United States, and thereafter no valid location of a mining claim can be made thereon, based upon a discovery of mineral-hearing rock in place lying within the lines of the claim so first located, save any except by the owner of the claim so first located, and a location so made by such owner would be an act of abandonment of at least so much of the first location as might be included within the lines of the second, and should such location include the discovery shaft of the first, then such location would be an act of abandonment of the whole of the first location."

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING MARCH 2, 1880.

225,002.—HOSE-PIPE NOZZLE—F. L. Alderson and T. Loftus, Sacramento, Cal.

224,082.—WHIP AND REIN HOLDER—G. D. Anderson, Oakland, Cal.

225,001.—EXCAVATING MACHINE—J. T. Dongine, S. F.

225,161.—AIR COMPRESSOR—J. H. Parkinson, Virginia, Nevada

225,023.—ORE FEEDER—H. M. Ransom, Oakland, Cal.

225,194.—DREDGING MACHINE—Z. Williams, Oakland, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

REVOLVING FIRE-ARMS.—Alfred Swingle, No. 114 and 124 Spear street, S. F. Patented Feb. 17, 1880. No. 224,742. This invention relates to an improvement in fire-arms or guns of that class known as "revolving breech-loaders." All the movements necessary to charge and discharge the arm are positive, and none of them depend upon any spring except the hammer and trigger, which are actuated in a manner similar to those in other arms. The arm consists of very few simple and strong parts, which are easily dismounted or assembled. Each cartridge in the magazine, as it reaches a position in line with the barrel, is forced into the chamber of the barrel by a plunger which is caused to reciprocate in line with the barrel by mechanism. The plunger has two steel hooks attached to its front end, top and bottom to serve as an extractor, and when the plunger is drawn back it will be seen that the rotation of the magazine will carry the flange of each shell into a position between these hooks and the head of the plunger. When this plunger is forced forward it carries the cartridge into the chamber of the barrel, and when it is drawn back it brings the shell with it, so that it again lies in the magazine ready to be carried around to the point of discharge by the rotation of the magazine. The advantages claimed for this invention are as follows: It is strong and yet simple, capable of standing hard service with little liability of getting out of order. It can be loaded and fired with great facility, and for durability and penetration is equal to the best arm in use. The magazine being so constructed that the cartridges are side by side instead of being in line with each other, with the primer of one resting on the point of the preceding one, there is no danger of premature explosion. The machinery working with positive movements, there is no liability of its failing to perform service. It can be used as a single breech-loader or repeater. The principle can also be applied to pistols, shot-guns, rifles or machine guns.

PLEDGED MINING STOCKS.—Judge Daingerfield has rendered judgment on the pleadings in the case of W. D. Heaton vs. S. P. Warren *et al.*, an action to recover on promissory notes given for mining shares. The defense set up that plaintiff represented that he owned nearly all of certain stock, and that the same, under the agreement of sale, was to be retired from the market and placed in plaintiff's keeping for the use of defendants, to be surrendered upon payment of 50 cents per share, but that they were sold for expenses and an assessment. It was alleged that the representations were not true, and that plaintiff had many other shares, which were thrown on the market, thereby decreasing the value of defendants' shares. Judge Daingerfield did not consider these averments a defense. Another defense was that plaintiff held the stock as a pledge or mortgage, and that the security ought to have been exhausted before the action was brought. The court held that such property is not the subject of mortgage. But if it were, he did not think it would be the duty of the holders of mining stock, when holding under a pledge, to sell it, except upon the request of the pledger. He might do so and protect himself provided he obeyed the sections of the Code implicitly, but was not compelled to do so. He might foreclose a lien by selling the pledge and sue for the balance due, but was not compelled to do so. The answer showed that the stock had been sold for assessments. It was the duty of the owners to pay the assessments and keep the pledge intact. They failed to do so, and plaintiff was deprived of all security. There was no allegation of damage except in expectant profits, which profits were too remote to be recoverable by way of offset.

ABOUT 60 Chinese arrived in St. Louis Monday from San Francisco, and all but 10 or 12 of them passed through en route to New York and other Eastern cities, where they will seek employment in the shoe and cigar factories, laundries, etc. A general exodus of Chinese from the Pacific coast is threatened.

Metal Items.

From James Lewis & Son's Monthly Report on Ores and Metals, at Liverpool, Eng., January 31st:

Copper—Sales in January of ore 9,686 tons, from 13s 6d per unit early in the month to 15s 6d at its close. Sales of precipitate 2,026 tons, from 14s to 15s 6d per unit. Sales of regulus 3,525 tons, from 14s to 15s per unit. Quotations January 31st are: Good ordinary brands £73 to £73 10s, for arrivals £74 10s to £75 per ton. Regulus 15s 6d, and good ore 15s per unit. Imports 1879, 95,474 tons fine. Exports, 29,129 tons fine.

Lead—£19 to £19 10s per ton for ordinary shipping brands, showing an advance of £4 10s on the year. Spanish soft silver, £18 10s to £18 15s per ton.

Antimony—An advance of £21 per ton in the year. Ruling price £71 to £73 per ton for French Star regulus.

Tin—Straits and Australian advance £30 10s during the year, and £7 during the past month. The quotations to date are £98 to £98 5s, and £104 per ton for English.

PAGE introduced a hill in the House Monday to confirm the patents heretofore issued to the Western Pacific Railroad Company for certain lands within the boundaries of the rejected Moquelemas grant, which have been ruled out by the Interior Department.

M. ROUHER and wife have started for Chiselhurst to take leave of the ex-Empress Eugenie, previous to her departure for Zululand on the 26th. The Empress will stop at St. Helena on her return voyage.

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.
R. W. CROWELL—California.
A. O. KNOX—Pacific Coast.
G. W. MCGREW.—Santa Clara county.
J. B. BACHELDER.—Shasta County, Cal.
JAMES ROGERS—Oregon and Washington Ter.
CAPT. W. H. SEAMENS—Arizona.
M. P. DWEN—Santa Cruz County.
H. E. HALLETT—Alameda County.
PERLEY P. KILBOURNE—Sacramento County.
M. B. STARR—Contra Costa county.
F. M. VARDEN—Alameda Co., Cal.
C. A. MCMAHON—Sutter and Yuba counties.
J. W. A. WRIGHT—Merced, Tulare, Kern and Fresno counties.
LORANE MINOR—Sacramento Co.
H. D. OLIVER—San Francisco and Alameda counties.
N. E. BOYD—San Bernardino Co.
J. M. HARTMAN—Solano and Sonoma counties.
S. M. PERRY—Los Angeles, Cal.
JARED C. HOAG—California.

In the Whole History of Medicine

No preparation has ever performed such marvelous cures, or maintained so wide a reputation, as AYRES' CHERRY PECTORAL, which is recoguized as the world's remedy for all diseases of the throat and lungs. Its long continued series of wonderful cures in all climates has made it universally known as a safe and reliable agent to employ. Against ordinary colds, which are the forerunners of more serious disorders, it acts speedily and surely, always relieving suffering, and often saving life. The protection it affords, by its timely use in the throat and chest disorders of children, makes it an invaluable remedy to be kept always on hand in every house. No person can afford to be without it, and those who have once used it never will. From their knowledge of its Composition and effects, physicians use the CHERRY PECTORAL extensively in their practice, and Clergymen recommend it. It is absolutely certain in its remedial effects, and will always cure where cures are possible.

FOR SALE BY ALL DEALERS.

PIEDMONT SPRINGS.—The exciting and stimulating properties of pure oxygen are well known, and everyone has felt the invigorating influence of fresh air. When the system becomes nervous, and the brain fatigued with the cares of business, just go into the open air, take a ride to Piedmont on a pleasant day, drink of the pure mineral waters, climb the Rigi for an inspiring view, and the effect will be instantly perceived; the blood will course with freshness; the lungs will work with increased activity; and the whole frame will feel revivified, and nature's stimulant will be found the cheapest and the best. The fare by street railroad from Oakland is ten cents.—*Work and Play.*

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct (or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omissions of agents.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

(WHOLESALE.)

WEDNESDAY M., March 10, 1880.

IRON.—
American Pig, soft, ton ..... 42 00 @50 00
Scotch Pig, ton ..... 38 00 @42 50
American White Pig, ton ..... — @35 00
Oregon Pig, ton ..... 28 00 @35 00
Refined Bar ..... 4½ @ 5½
Horse Shoes, keg ..... 7 00 @ 8 00
Nail Rod ..... — @ 9
Norway, according to thickness ..... 8½ @ 9½

STEEL.—
English Cast, lb ..... 16 @ 18
Black Diamond, ordinary sizes ..... 13 @— 15
Drill ..... 9 @ 10
Flat Bar ..... — @ 16
Plow Steel ..... 9 @ 10

COPPER.—
Ingot ..... — @ 32½
Sheathing ..... — @— 38
Sheathing, Tinned 14x48 ..... — @ 42
Nails ..... — @— —
Bolts ..... 38 @— 42
Old ..... — @— 18
Brazier's, in all sizes ..... 38 @ 41
Precipitate, 100 fine ..... 19 @— 20

LEAD.—
Pig ..... 6 @— 6¼
Bar ..... — @— 6½
Pipe ..... — @— 8
Pipe, Soft ..... — @— 9
Shot, Discount 10% on 500 Bags.
Drop, per bag ..... — @ 1 80
Buck, " " ..... — @ 2 50
Chilled " " ..... — @ 2 75

TIN PLATES.—
10x14 I D Charcoal ..... — @10 50
10x14 I C Coke ..... 10 00 @10 00
Banca Tin ..... — @25 00
Australian ..... — @20 00
I. C. Charcoal, Roofing 14x20 ..... — @10 00
" " " " 20x28 ..... 21 50 @22 00

ZINC.—
By the Cask ..... — @—10
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask .. 10½@— 11

NAILS.—
Assorted sizes ..... 6 50@6 75

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, March 10, 3 P. M.

SILVER, ¼ par.
GOLD BARS, 830@910. SILVER BARS, 10@18 ₱ cent. discount.
EXCHANGE on New York, 25, on London bankers, 401@ 49½. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 90@92.
LONDON Consols, 97 7-16; Bonds (4½), 108.
QUICKSILVER in S. F., by the flask ₱ lb 42½@45c.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. MCGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F. MCGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. MCGREW, Secretary.

Office—room 7, No. 420 Montgomery St., San Francisco, California.

California and Oregon Land Company.—

Principal place of business, San Francisco, California. Location of works, Lake and other counties, Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 5th day of February, 1880, an assessment of Thirty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary.

Any stock upon which this assessment shall remain unpaid on the 15th day of March, 1880, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the 15th day of April, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, 318 Pine street, room 6, San Francisco, California.

Cataract and Wide West Gravel Mining

Company.—Location of principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment levied on the 2nd day of February, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. Shares.	Amt.
John H Floto	624	50	12 50
John H Carey	418	75	18 75
John H Carey	708	50	12 50
Thomas Bates	440	25	6 25
Thomas Bates	448	25	6 25
Thomas Bates	450	25	0 25
Thomas Bates	456	25	6 25
Thomas Bates	457	50	12 50
Thomas Bates	462	5	1 25
Thomas Bates	403	10	2 50
Thomas Bates	469	50	12 50
Thomas Bates	481	10	2 50
Thomas Bates	483	25	6 25
John H Barry, Trustee	577	1000	250 00
Virginia P Paul	636	10	2 50
Jno M Bowers	630	200	50 00
Thos F Baines	637	50	12 50
J E W Coleman	625	50	12 50
Robt Rostron	396	50	12 50
James White	419	20	5 00
James White	421	50	12 50
D Frederick	528	30000	7500 00
Theresa Bowers	551	100	25 00
Theresa Bowere	631	200	50 00
Thoresa Bowere	632	50	22 50
Mary C Floto	547	400	100 00
Mary C Floto	548	100	25 00
Mary C Floto	601	500	125 00
Mary C Floto	623	450	112 50
Edwin McNevin	622	250	62 50
John Rostron	600	100	25 00
Emma Floto	604	500	125 00
George Floto	620	25	6 25
Wilber Curtis	633	25	6 25
Wilber Curtis	634	25	6 25
Wilber Curtis	640	50	12 50
Wilber Curtis	642	50	12 50
Wilber Curtis	643	50	12 50
Wilber Curtis	644	50	12 50
Wilber Curtis	648	25	6 25
Anne Slibitz	683	50	12 50
Augustus Slibitz	634	50	12 50
J T Stone	696	150	37 50
D Campbell	608	25	0 25
J M Bryan	609	220	50 50
A J Dowling	701	50	12 50
F F DuRose	703	500	125 00
A G Lawrence	706	500	125 00
Henrietta Siebeck	716	50	12 50
Robt Reed	638	100	25 00
J C DeVoy, Trustee	331	1000	250 00
J C DeVoy, Trustee	332	1000	250 00
J C DeVoy, Trustee	333	1000	250 00
J C DeVoy, Trustee	334	1000	250 00
J C DeVoy, Trustee	335	1000	250 00
J C DeVoy, Trustee	337	250	62 50
J C DeVoy, Trustee	338	250	62 50
J C DeVoy, Trustee	339	250	62 50
J C DeVoy, Trustee	340	250	62 50
J C DeVoy, Trustee	341	250	62 50
J C DeVoy, Trustee	342	250	62 50
J C DeVoy, Trustee	343	250	62 50
J C DeVoy, Trustee	344	250	62 50
J C DeVoy, Trustee	345	250	62 50
J C DeVoy, Trustee	346	250	62 50
J C DeVoy, Trustee	347	500	125 00
J C DeVoy, Trustee	348	300	75 00
J C DeVoy, Trustee	340	500	125 00
J C DeVoy, Trustee	350	300	75 00
J C DeVoy, Trustee	351	500	125 00
J C DeVoy, Trustee	352	500	125 00
J C DeVoy, Trustee	353	500	125 00
J C DeVoy, Trustee	354	500	125 00
J C DeVoy, Trustee	355	500	125 00
J C DeVoy, Trustee	350	500	125 00
Elizabeth T DeVoy	357	300	75 00
J C DeVoy, Trustee	358	500	125 00
Elizabeth T DeVoy	359	300	75 00
J C DeVoy, Trustee	360	500	125 00
Elizabeth T DeVoy	361	300	75 00
Elizabeth T DeVoy	362	300	75 00
Elizabeth T DeVoy	363	300	75 00
Elizabeth T DeVoy	364	300	75 00
John C DeVoy, Trustee	365	300	75 00
John C DeVoy, Trustee	366	300	75 00
John C DeVoy, Trustee	368	50	12 50
John C DeVoy, Trustee	369	50	12 20
John C DeVoy, Trustee	370	50	12 50
John C DeVoy, Trustee	371	50	12 50
John C DeVoy, Trustee	372	50	12 50
John C DeVoy, Trustee	373	50	12 50
John C DeVoy, Trustee	375	50	12 50
John C DeVoy, Trustee	376	50	12 50
John C DeVoy, Trustee	377	50	12 50
John C DeVoy, Trustee	378	50	12 50
John C DeVoy, Trustee	380	50	12 50
John C DeVoy, Trustee	381	50	12 50
John C DeVoy, Trustee	382	50	12 50
John C DeVoy, Trustee	383	50	12 50
John C DeVoy, Trustee	386	50	12 50
John C DeVoy, Trustee	387	50	12 50
John C DeVoy, Trustee	388	50	12 50
John C DeVoy, Trustee	389	50	12 50
John C DeVoy, Trustee	390	50	12 50
J C DeVoy	401	50	12 50
J C DeVoy	403	50	12 50
Elizabeth DeVoy	441	100	25 00
Elizabeth DeVoy	442	100	25 00
J C DeVoy, Trustee	443	100	25 00
J C DeVoy, Trustee	444	100	25 00
J C DeVoy, Trustee	482	100	25 00
J C DeVoy, Trustee	484	100	25 00
J C DeVoy, Trustee	480	100	25 00
J C DeVoy, Trustee	488	100	25 00
J C DeVoy, Trustee	490	1000	250 00
J C DeVoy, Trustee	495	50	12 50
J C DeVoy, Trustee	496	50	12 50
J C DeVoy, Trustee	497	50	12 50
J C DeVoy, Trustee	498	50	12 50
J C DeVoy, Trustee	499	50	12 50
J C DeVoy, Trustee	500	50	12 50
J C DeVoy, Trustee	501	100	25 00
J C DeVoy, Trustee	502	100	25 00
J C DeVoy, Trustee	503	100	25 00
J C DeVoy, Trustee	504	100	25 00
J C DeVoy, Trustee	505	100	25 00
J C DeVoy, Trustee	506	100	25 00
J C DeVoy, Trustee	507	100	25 00
J C DeVoy, Trustee	508	100	25 00
J C DeVoy, Trustee	509	100	25 00
J C DeVoy, Trustee	510	100	25 00
J C DeVoy, Trustee	511	100	25 00
J C DeVoy, Trustee	512	100	25 00
J C DeVoy, Trustee	513	100	25 00
J C DeVoy, Trustee	514	100	25 00
J C DeVoy, Trustee	515	100	25 00
J C DeVoy, Trustee	516	100	25 00
J C DeVoy, Trustee	517	100	25 00
J C DeVoy, Trustee	518	50	12 50
J C DeVoy, Trustee	519	100	25 00
J C DeVoy, Trustee	520	50	12 50
J C DeVoy, Trustee	521	50	12 50
J C DeVoy, Trustee	522	50	12 50
J C DeVoy, Trustee	523	50	12 50
J C DeVoy, Trustee	524	125	31 25
J C DeVoy, Trustee	527	125	31 25
J D Barry	600	100	25 00
J H Carey	605	250	62 50
J H Carey	722	1850	462 50
J D Barry	723	3000	750 00
John Rostron	724	400	100 00
J H Floto	302	300	75 00
F F DuRose	628	150	37 50
Jno H Floto	392	300	75 00
Laura A Tallmadge	542	25	6 25
A Wm Meyers	715	306	75 00

And in accordance with law and an order of the Board of Directors made on the 2nd day of February, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, No. 28½ Kearny street, San Francisco, California, on Monday, the 29th day of March, 1880, at the hour of 10 o'clock A. M. of said day, together with costs of advertising and expenses of sale.

WM. B. LAKE, Secretary.

Office, 28½ Kearny street, San Francisco, California.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Eighth day of March, 1880, an assessment (No. 41) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twelfth day of April, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the Third day of May, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSDN, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) levied on the 14th day of January, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
J R Robbins, Trustee	17	68	6 80
J R Robbins, Trustee	61	1000	100 00
J G Whitney, Trustee	30	1000	100 00
A Hinds	57	1000	100 00
A Hinds	58	1167	116 70
J K Cooper, Trustee	106	100	10 00
T L Bibbins, Trustee	99	100	10 00
T L Bibbins, Trustee	100	100	10 00
T L Bibbins, Trustee	101	100	10 00
T L Bibbins, Trustee	103	50	5 00
T L Bibbins, Trustee	133	1000	100 00
T L Bibbins, Trustee	134	1000	100 00
T L Bibbins, Trustee	136	1000	100 00
T L Bibbins, Trustee	142	450	45 00
T L Bibbins, Trustee	146	100	10 00
T L Bibbins, Trustee	147	50	5 00
T L Bibbins, Trustee	148	50	5 00
T L Bibbins, Trustee	150	500	50 00
T L Bibbins, Trustee	157	100	10 00
T L Bibbins, Trustee	162	100	10 00
T L Bibbins, Trustee	163	100	10 00
T L Bibbins, Trustee	160	500	50 00
T L Bibbins, Trustee	170	500	50 00
T L Bibbins, Trustee	176	50	5 00
T L Bibbins, Trustee	185	100	10 00
T L Bibbins, Trustee	213	100	10 00
T L Bibbins, Trustee	210	500	50 00
T L Bibbins, Trustee	217	500	50 00
T L Bibbins, Trustee	218	500	50 00
T L Bibbins, Trustee	219	3000	300 00
T L Bibbins, Trustee	228	100	10 00
T L Bibbins, Trustee	229	100	10 00
T L Bibbins, Trustee	231	100	10 00
T L Bibbins, Trustee	235	500	50 00
T L Bibbins, Trustee	254	20	2 00
T L Bibbins, Trustee	269	100	10 00
T L Bibbins, Trustee	273	50	5 00
T L Bibbins, Trustee	203	1000	100 00
T L Bibbins, Trustee	373	97	9 70
T L Bibbins, Trustee	383	150	15 00
T L Bibbins, Trustee	308	50	5 00
T L Bibbins, Trustee	425	100	10 00
T L Bibbins, Trustee	420	100	10 00
T L Bibbins, Trustee	427	100	10 00
T L Bibbins, Trustee	428	100	10 00
T L Bibbins, Trustee	420	100	10 00
T L Bibbins, Trustee	430	100	10 00
T L Bibbins, Trustee	431	100	10 00
T L Bibbins, Trustee	436	1000	100 00
J Colman, Trustee	354	100	10 00
M French, Trustee	340	1000	100 00
H R Taylor, Trustee	349	50	5 00
Jos F Nounnan, Trustee	361	100	10 00
Jos F Nounnan, Trustee	366	100	10 00
J Orlswold, Trustee	441	0900	090 00
Unknown	247	30	3 00
Unknown	240	8	80
Unknown	251	65	6 50
Unknown	253	30	3 00
Unknown	255	30	3 00
Unknown	250	42	4 20
W Townsend, Trustee	410	1000	100 00
W Townsend, Trustee	411	500	50 00
W Townsend, Trustee	412	500	50 00
J M Hinkle, Trustee	309	1700	170 00
T A Wright, Trustee	294	1000	100 00
T A Wright, Trustee	370	300	30 00
T A Wright, Trustee	307	20	2 60
T A Wright, Trustee	300	1000	100 00
J R Robbins	357	20	2 00
G L Waters, Trustee	410	200	20 00
W J Gwynn	402	1000	100 00
Oco D McMullin, Trustee	421	500	50 00
M K Lauden, Trustee	287	250	25 00
M K Lauden, Trustee	288	250	25 00
M K Lauden, Trustee	300	1000	100 00
M K Lauden, Trustee	301	1000	100 00
M K Lauden, Trustee	302	1000	100 00
M K Lauden, Trustee	303	1000	100 00
M K Lauden, Trustee	304	1000	100 00
E A Richardson, Trustee	315	500	50 00
E A Richardson, Trustee	316	500	50 00
E A Richardson, Trustee	317	500	50 00
E A Richardson, Trustee	318	500	50 00
E A Richardson, Trustee	319	500	50 00
E A Richardson, Trustee	320	500	50 00
E A Richardson, Trustee	321	500	50 00
E A Richardson, Trustee	322	500	50 00
E A Richardson, Trustee	323	500	50 00
E A Richardson, Trustee	324	500	50 00
E A Richardson, Trustee	325	500	50 00
E A Richardson, Trustee	326	500	50 00
E A Richardson, Trustee	327	500	50 00
E A Richardson, Trustee	328	500	50 00
E A Richardson, Trustee	329	500	50 00
E A Richardson, Trustee	330	500	50 00
A H Todd & Co., Trustee	418	200	20 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 314 Bush street, San Francisco, on Thursday, the 11th day of March, 1880, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

T. L. BIBBINS, Secretary.

Office—314 Bush street, San Francisco, California.

PDSTPDNEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Thursday, the 25th day of March, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

OFFICE OF THE

Original Gold Hill Gold and Silver Mining Company,

Gold Hill Mining District, Storey County, Nevada.

NOTICE!

A special meeting of the stockholders of the Original Gold Hill Gold and Silver Mining Company will be held at the office of the Company, rooms 3 and 4, second floor, 300 California street, San Francisco, on Monday, the 15th day of March, 1880, at 2 o'clock P. M., for the purpose of disposing of the stock belonging to the Company, and such other business as may legally come before said meeting. Transfer books will be closed on Saturday, the 6th day of March, 1880, at 3 o'clock P. M.

J. M. BUFFINGTON, Secretary.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE ..... Manager.
CHAS. H. GOODWIN ..... Treasurer.
J. P. CHAPMAN ..... Assistant Treasurer.

CLARA MORRIS.

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CHAS. E. LOCKE ..... Lessee and Manager

E. A. SOTHERN.

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HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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Golden State Pressure Blowers.

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THOMPSON BROTHERS,

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AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
SHAFTING,	PULLEYS,	ETC., ETC.

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William Hawkins,

(SUCCESSOR TO HAWKINS & CANTRELL).

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Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

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Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

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Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanks.

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Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for use on land. Water Pipe, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

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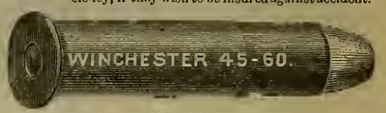

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It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

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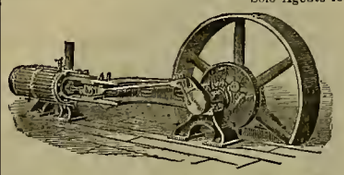

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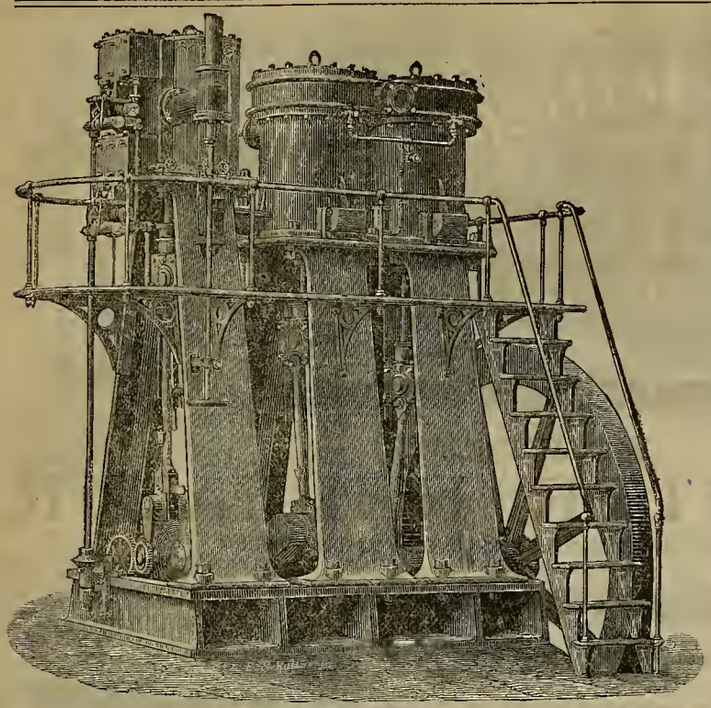

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Stronger, Better and Safer than any other High Explosive

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

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The Strongest, Safest, Most Uniform and Reliable "HIGH EXPLOSIVE" Manufactured on the Coast.

MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

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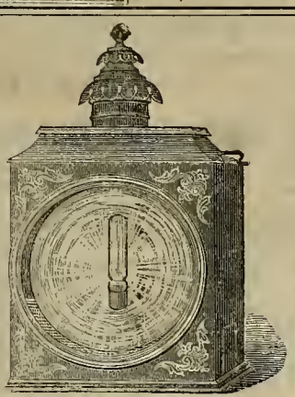

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Pacific Lamp and Reflector Factory,

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Mining Engineer.

Formerly Director of the Bureau of Statistics of the United States; Superintendent of the United States Special Commissioners of Mines; Member of the Committee on Mines at the Congress of Nations held in St. Petersburg, Russia; Mining Commissioner for the United States Monetary Commission; author of a History of the Precious Metals, etc.

216 Sansome St., San Francisco.

Mining properties surveyed and reported upon; assays and quantitative analyses made of ores, etc.

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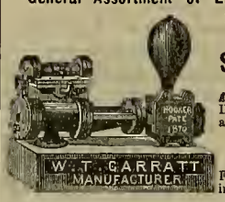

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STEAM PUMP

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For Mining and Farming Purposes.

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For Ventilating Mines and for Smelting Works.

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Member of the Jury on Wood-working Machinery at Paris Exposition of 1878.

This thorough work, impartially written in a clear, simple and practical style, treats the Saw scientifically, analyzing its action and work, and describing, under the leading classes of Reciprocating and Continuous Acting Saws, the various kinds of large and small hand, sash, Mulay, jig, drag, circular, cylinder and band Saws, as now and formerly used for crosscutting, ripping, scroll-cutting, and all other sawing operations in wood, stone and metal, ice, ivory, etc., in this country and abroad. With appendices concerning the details of manufacture, setting, swaging, gumming, filing, etc., tables of gauges, log measurements from 10 to 24 feet, and from 12 to 96 inches, lists of all U. S. Patents on Saws from 1790 to 1880, and other valuable information. Elegantly printed on extra heavy paper, wide margin, copiously indexed.

Owing to an increase of nearly 100% in number of pages and illustrations since first projected, the price is this date made $2.50, postage paid

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MARCH 20, 1880.

VOLUME XL Number 12.

The White Rotary Pulverizer.

We present on this page a fine engraving of the White Rotary Pulverizer, the invention of George W. White, of this city. The mining community has been called upon to examine very many varieties of ore pulverizers, few of which have worked any length of time owing to various causes, principally to a lack of free discharge and to the beating, friction and wear consequent upon high speed. Mr. White claims to have overcome these faults in the newly devised machine; the first by the friction gear shown in the engraving, and the latter by the fact that the discharge is entirely open, and not through either wire screens or punched plates, the ore being very highly pulverized in its passage through the beater bars.

The bed plate of the pulverizer is cast in three pieces which are bolted together. The chairs for the friction rollers are planed on the bottom, and their seats on the bed plate are also planed. The machine is entirely open at the bottom of the cage, the center piece of the bed plate being cut out five inches wider than the cage which carries the beater bars.

There are five rows of beater bars, three rows running in one direction and two alternate rows running in the opposite direction. The rows of beater bars are 1¼ inch apart, the disintergrating being accomplished entirely by the attrition of the ore being accomplished entirely by the attrition of the pieces.

The ore for the pulverizer must first be passed through a rock breaker, to reduce it suitably for being fed by the screw feed. The cage consists of two distinct compartments, all but the outer row of beater bars being attached to concentric rings, which latter are in turn attached to their respective outer and inner shafts.

The beater bars are made of the best homogeneous steel. The shafts carrying the cage are also of steel and are hollow, the larger being nine inches in diameter, carrying the outer disks; the smaller one seven inches in diameter, carrying inner concentric rings. The metal is three-quarter inch in thickness, thus leaving a half inch space between the shafts, and a space five and a half inches in diameter through the inner shaft for the feed tube.

The feed screw, by a peculiar construction of the tube at the inner end, distributes the ore in equal quantity to each compartment of the cage. The inner shaft is adjusted so that it does not bear against the outer one; and both shafts are kept in their horizontal position by adjusting the friction pulleys by means of set screws at each bearing; the boxes for the gudgeons of the friction pulleys, all being free to move up and down, resting on the set screws.

The outer shaft is kept from moving horizontally by a set collar at each end screwed on to the inner shaft. The inner shaft is kept in place horizontally by means of two thrust bearings bolted into the end chairs, carrying layers of steel friction rings, against which the ends of the shaft run.

The friction pulleys for the inner shaft are 18 inches in diameter, and those for the outer shaft two inches less. Oil cups are set to each gudgeon bearing, and require filling once in 24 hours.

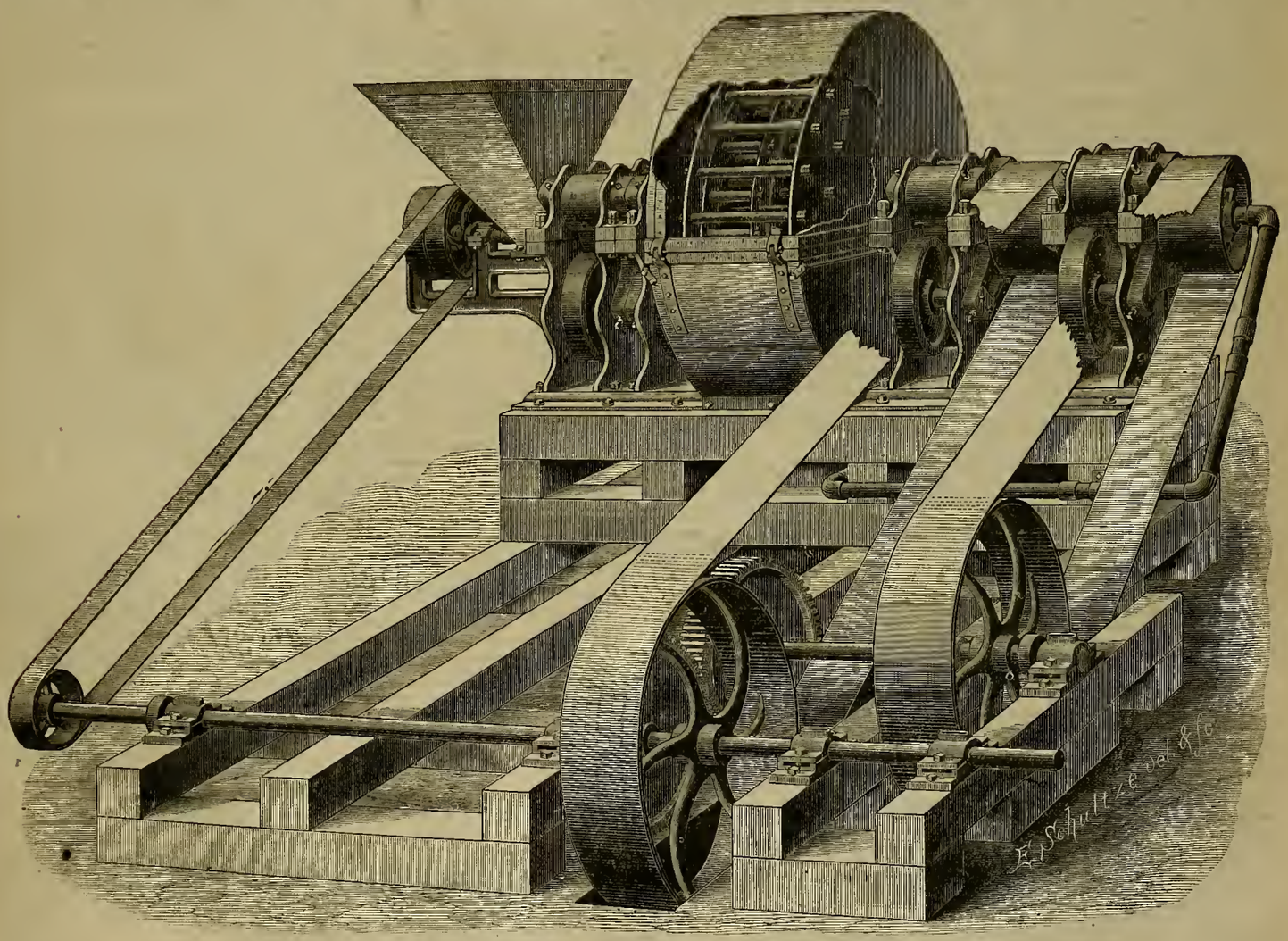
A revolving screen, 48 inches in diameter, is placed under the cage and is geared to the driving or line shaft. It is of sufficient capacity for 200 tons per 24 hours, through No. 40 screens.

We are told that no dust arises in the feed hopper, or escapes out of the machine, and that all the adjustments can be made while it is in motion. The pulleys carrying the end of the outer shaft, next to the hopper, are not shown in the engraving. The pipe shown is to relieve any extra pressure of air in the screen chamber below.

The constant pulverizing power of this machine is absolute from the moment the ore begins feeding to the beater bars. There is no loss of time and power as in lifting stamps.

Mr. White has already built one of these pulverizers, 56 inches in diameter. After trying this No. 1 machine to his satisfaction, in this city, he contracted to put it at work for the Alexander mining company at Grantsville, Nev., guaranteeing its success. Mr. Jno. L. Bray was Mr. White's agent, and erected the machine at the works, turning it over to the company complete in the latter part of January, since which time it has been in daily use, and Mr. White tells us, doing more than was guaranteed, exceeding even his expectations.

This 56-inch, No. 1, pulverizer can readily be built in sections so small as to be easily packed on animals. The pulp delivered is of uniform size, very suitable for concentration, roasting or lixiviation. A patent has been allowed for this apparatus. It is manufactured at the Ætna Iron Works, 217 Fremont St., in this city. Prices will be seen by referring to card in another column.



GEO. W. WHITE'S IMPROVED ROTARY ORE PULVERIZER.

LARGE MINING SALE.—The statement is made that the Shiefflin Bros., have sold their interest in the Tombstone mill and mines for $2,000,000 to Corbin Bros., and the Disston party, of Philadelphia, and Messrs. Simmons and Squire of Boston. The price looks pretty steep.

IT IS understood that the Central Pacific Railroad Company is considering the propriety of laying off ground at Sacramento for cattle yards.

THE Hirschman gravel claims in Nevada county are reported sold to New York gentlemen for $95,000.

THE Oneida mill, in Amador county, is now running 40 stamps, and the Zeile mill 20 stamps.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Mayflower Gravel Mine.

EDITORS PRESS:—Among the mines of this district is the Mayflower gravel mine, which covers 450 acres of mining ground, and has two ontlets, one in the Yonng American canyon, the nther in the Second Brnshy canyon—hoth canyons trihutaries of the Shirt Tail canyon. It has pnt in the Young American canyon 6,200 feet of flume, 40 inches wide and 24 inches high, lined with blocks, 8 inches in thickness, the whole lcngth of the flume. It has heen prospecting their property since the 1st day of November, 1877, with the most encouraging results, and if it was not for an injunction put on their works over 11 months ago, the owners would have already received handsome dividends, and a large number of men would find employment.

It has found the continuation of the Paragon lead, owned by Messrs. Breese and Wheller. Tbis famous lead is an upper lead 150 feet above hedrock. Tbe gravel has been followed and mined for a distance of over 4,000 feet in the hill, in a northwesterly direction. The Mayflower claim is the adjoining claim of the Paragon on the northwest; the easterly line of the Mayflower is running about 2,000 feet with the northwesterly line of the Paragon.

The Mayflower intends to take tbe water for hydraulicing purpose from Messrs. Breese and Wbeller's ditch, the Miners' ditch, which passes on this side of the divide, heing the property of the Dardanelles company, who need all the water they can obtain from their ditch to wash away a very thick bank of hard cement covering their gravel. Other mines in the Second Brnshy, Messrs. Alhrect and Brown among them, intend also to take water from Messrs. Breese and Wheller.

Lately the Mayflower company have began to open the mine in the second outlet, the Seeond Brushy canyon, and they are now preparing the ground to hydraulic some very good surface diggings found there. The company is also rnnning a prospecting tunnel for drifting purpose; some very good gravel has been already found on the bedrock. The tunnel will he run to tbe main channel of this divide, wbich is known to pass on the Mayflower ground.

F. C.

Forest Hill, Cal., Mar. 1, 1880.

Prof. Blake's Address Before the Bullion Club.

Prnf. W. P. Blake addressed the Bullion Club, New York city, on the subject of his recent trip among the Western mines, and helow we give the substance of his remarks:

He spoke of the great quantity of snow which covered the great ranges of .mountains, on some of whicb it was deeper than ever before known. This winter, he said, has been unexceptionally severe on the ranges. The great fall of snow, however, promises an unusual harvest of gold next seasou, for it is with the water coming from this snow that the placer miner secures the gold.

In describing bis trip from Salt Lake City be said that he first came to the Bingham Canyon deposits, which have excited more than usual attention and interest during the past summer. They are great ferruginous outcrops, carrying deposits of argentiferous lead and bodies of carbonate lead, also great masses of iron pyrites. The miners paid little regard to these deposits until last season, when they found that the larger portions of the outcrop paid for working in the ordinary way. The absence of a bountiful supply of water bas, however, been disadvantageous, and it is proposed to transport tbese ores to Jordan river to have them refined.

In the district in which tbe noted Ontario mine is located, mining has been carried on very successfully during the past year. In the Ontario mine a depth of 600 feet has heen reached, and the vein looks as well below as above. One prominent feature in regard to the increasing value of this property is its consolidation with the Last Chance mine, which adjoins it. This consolidation will greatly strengthen the Ontario in regard to the producing of ore, as explorations in the Last Chance have shown great richness. The lodes extending beyond these mines seem to contain mineral for several miles.

In southern Utah there are many interesting properties. The great Silver Reef region is of particular interest to miners from the fact that it is a vast mass of ore in modern sandstone, in which very few miners would ever look for valuable deposits of silver ore. The completion of the Utah Southern railroad has opsned up many interestiug districts which have heretofore been inaccessible. The town of Butte is a particularly interesting mining center for Montana, as some of her best developed mines are located there. The principal mine of that region is the Alice, which is now down to a depth of 500 feet. The vein is from 40 to 80 feet in width, and passes through different bodies of ore which might be called low grade.

In Nevada there are the important minea of Eureka and Comstock. The hot water of the latter, he tbougbt, was local, and if it [abould be caugbt and carrisd off, tbe heat would be mucb lessensd. To secure the future success of the Comstock, thsre should bs consolidation and unity of intsrest, and a deep shaft should he started far east to intercspt the vein at a considerahle dspth.

Bodie, which belongs to the interior system of mineral deposits, is one of the most interesting mineral deposits of which there is any knowledge. In California, the gold mines, wherever worked with skill and energy, are doing remarkably well. Just now there is a period of depression in that State. The Empire is now paying dividends. It is an enormous vein and a promising mine.

Plumas county, one of the best gold-producing counties in the State, contains the Green Mountain, Cherokee, Gold Stripe, Plumas, National, Crescent aud others. The Crescent has been worked with great profit for a long time, and has declared $300,000 in dividends. The Green Mountain mine has the advantage of being upon a mountain, and can be worked by tunnels rather than by shafts. This location is snch that the ores can be excavated and trammed out to the mill at a smaller expense than probably any other mine at the present time. The ore from this mine yields from $7 to $10 per ton, which leaves a very large profit. Tbe vein is very large, and has some peculiar characteristics which mark it as allied to deposits of hot water.

The Indiana Valley has a great history, but is lying idle and awaiting enterprise and capital to reopen it. The Gold Stripe is now being worked successfully, and promises well for the future. All the mines in this group in the vicinity of the Indian Valley are well supplied with timber and water, and everything necessary for successful mining operations, and it is hoped will add largely to the bullion production of California.

In Arizona great interest is manifested in mining. This will he one of the greatest mineral producing territories, and it will be especially interesting because it is soon to he opened throughout by the Southern Pacific railway. The climate in that country is never so severe as to interfere with mining operations, and railroads are soon to he built, making the mining regions accessible from the east and west. The San Juan region is in southern Colorado, and contains some of the highest mountains in the Rocky mountain system. There are mountains with silver-hearing veins from the summit to the base, and this district is destined to be one of the most important mining centers of the American continent. Water and timber are abundant, and on the western slope the climate is remarkable; the soil is fertile in many places, and there are vasts beds of coal nearly equal to those nf the great coal fields. Further to the north and east of this region is Leadville, which is the most remarkable mineral locality in the known world. In conclusion, he said: "Taking the immense amount of bullion produced from the mines in our country, we can say tbat mining has become a great industry, and each one of us should put his shoulder to the wheel and endeavor to push it ahead."—*Economist.*

Patents for Mineral Lands.

The United States mining laws provide that a patent for any land claimed and located for valuable deposits may be obtained in the manner prescribed by Section 2325 of tbe Revised Statutes, which is as follows:

Any person, association, or corporation authorized to locate a claim under this chapter, having claimed and located a piece of land for such purposes, who has, or have, complied with the terms of this chapter, may file in the proper land office an application for a patent, under oath, showing such compliance, together with a plat and field notes of the claim or claims in common, made by or under the direction of the United States Surveyor-General, showing accurately the boundaries of the claim or claims, which shall be distinctly marked by monuments on the ground, and shall post a copy of such plat, together with a notice of such application for a pateut, in a conspicuous place on tho land embraced in such plat, previous to the filing of the application for a patcnt, and shall file an affidavit of at least two persons that such notice has been duly posted, and shall file a copy of the notice in such land office, and shall thereupon be entitled to a patent for tbe land, in the manner following: The register of the land office, upon the filing of such application, plat, field notes, notices and affidavits, shall publish a notice that such application has been made, for the period of sixty days, in a newspaper to he by him designated as publisbed nearest to snch claim; and he shall also post snch notice in his office for the same period. The claimant at the time of filing this application, or at any time thereafter, within the 60 days of publication, shall file with the register a certificate of the United States Surveyor-General that $500 worth of labor has been expended, or improvements made upon the claim hy himself or grantors; that the plat is correct, with such further description by such reference to natural objects or permanent monuments as shall identify the claim, and furnish an accurate description, to be incorporated iu the patent. At the expiration of the 60 days of publication the claimant ahall file his affidavit, showing that the plat and notice have been posted in a conspicuous place on the claim during auch period of publication. If no adverse claim shall have been filed with the register and the receiver of the proper land office at the expiration of the 60 days of publication, it shall be assumed that ths applicant is entitled to a patent, upon the payment to the proper officer of $5 psr acrs, and that no adverse claim sxists; and thereafter no objection from third parties to ths issuance of a patsnt shall he heard, except it be shown that the applicant has failed to comply with the terms of this chapter.

Since this section of the law was framed, some little difficulty was found in uon-residents patenting their land, their presence on the spot heing necessary. An amendmeut to the section has been recently made, which is added to the section, as follows:

Be it enacted hy the Senate and House of Rspresentatives of the United States of America in Congress assembled, That Section 2325 of the Revised Statutes of the United States he amended by adding thereto the following words: "*Provided*, That where the claimant for a patent is not a resident of the land district wherein the vein, lode, ledge or deposit sought to he patented is located, the affidavits required to be made in this section by the claimant for such patent may be made hy his, her or its authorized agent, where said agent is conversant with the facts sought to be established by said affidavits: *And provided*, That this section shall apply to all applications now pending for patents to mineral lands."

This will relieve non-residents of the burden of going to the ground to make affidavits which can just as well he made by agents who are conversant with the facts.

Homestead Settler's Bill.

Tbe hill passed by the United States Senate lately for the relief of bomestead settlers is a measure of great importance. It was originally introduced by Senator Booth, and his persistent efforts procured its passage both in the Public Land Committee and in the Senate. Under the existing law the right of pre-emption on puhlic land attaches from the date of settlement, but the right of a settler under the homestead law only from the date of entry. This bill provides that the land shall he giveu to the first settler, whether he claims as a pre-emptor or as a homesteader. Senator Booth said on this point: "There is no reason why the right of a homestead settler should not relate back hy his alleging the date of his settlement in his homestead affidavit, and the fact that a settler now before a survey, has no option, but must claim under the pre-emption law in order to cut intervening settlers nr grants, is sufficient reason why it should relate hack, for mauy settlers have already used their pre-emption right, and are now, although in possession of valuable improvements, entirely at the mercy of 'intervening pre-emptors, or railroad grants.'" The hill next provides that tho first settler upon an ahandoned homestead entry shall have a preference right to acquire title to it after the original entry is cancelled, and the last section substitutes for the present roundahout and dilatory method of cancelling relinquished homesteads and timber culture entries in the General Land Office, the common sense provisiou that such relinquishments shall be effectual as soon as they are filed in the local land office. Senator Booth, in explaining this section said: "These relinquishments are nearly always made as the result of the purchase of the improvements by some person who is looking for a homestead, and if the cancellation were immediately noted, he, by reason of his being a party in the matter, would be able to enter before anyone else; but as lbng as cancellations in such cases are made as at present, he has no advantage hy reason of such purchase, for in the interval it hecomes widely known in the neighborhood of the Land Office that the claim to that tract has been relinquished, and all the jumpers and speculators of both localities are immediately on the alert to ascertain iu advance of every one else the moment of the cancellation." This desire is no small source of corruption in the local land offices, and the reporting of cancellation, hy telegraph which goes hy mail, forms a considerable part of the husiness of some land attorneys.

A VALUABLE MAP.—There has just heen completed at the State Engineer's office that which is probably the largest map in the State. It is 26 feet in length, and covers a large portion of the walls of one of the main offices. It embraces the Sacramento and San Joaquin valleys from Iron canyon, beyond Red Bluff, to the foot of Tulare lake, and between the Sierra and Coast range foothills, and is intended to be a complete topographical and hydrographic chart of that section of the State. It shows the course of every mining ditch, reservoir, irrigating ditch, etc., and also all the larger and more important farms, in many cases even the locality of the houses. The tract of country wbich is now subject to flooding by mining debris is clearly depicted, so that any person can tell at a glance what proportion of the valley has been injured in this way. The Yolo, Sutter and Colusa basins are outlined, with figures showing the amount of water contained in each at certain stages of floods, etc. There is, in fact, nothing of a topographical or hydrographic nature concerning the section alluded to which this map does not show, and so clearly and on so large a scale that anybody of ordinary intelligence can understand it readily. It waa compiled from surveya made and data procured by the engineers of the department under charge of Mr. Hall, and speaka well for their efficiency and the enterprise of the State Engineer himself.—*Sacramento Bee.*

Public Lands Commission Report.

The forthcoming report of ths Public Lands Commission will recommend that swamp and pasturage lands hereafter be surveyed and patented by townships; that better provisions hs made for making boundaries of surveyed tracts; that the system of letting public surveys and boundaries between States and Territories bs hereafter made under the direction of the Coast and Geodetic Survey. It will also, probably, recommend that the office of Receiver at each local land office be abolished. There are about 95 of these officers. It will also recommend the classing of public lands into five general classes —arable, irrigable, pasturage, timber and mineral. It will also recommend the repeal of the pre-emption law, on the ground that its chief use now is to increase large individual holdings. The commission will probably supplement it by another, making arable puhlio lands disposable under the Homestead laws. The commission will probably recommend no limit hs placed upon amounts of irrigable land which any one person may huy; that the land be sold at 25 cents per acre, nne-fifth to be paid down and the balance at the end of three years, and that no patent to such lands he issued until it is shown that a specified sum per acre, say $2, has been expended on its reclamation. Lands classed as pasturage, will comprise untimbered and new mineral lands, not arable or capahle of irrigation.

The commission will probably recommend that the quantity one person may huy be not limited, and that the price he graduated as follows: All lands sold prior to January, 1886, hs at the rate of $1.25 per acre, and all lands sold from the latter date to January, 1890, to be at the rate of $1 an acre. After the last named date all lands remaining he sold at 75 cents an acre, with a reduction of 12½ cents per acre every three years until the minimum price of 12½ cents is reached. Pasturage lands shall he opened to homestead settlement, no one entry to comprise more than 2,560 acres. It will probably recommend that colonies of 20 or more families may enter homesteads either on arahle, irrigahle or pasturage lands, and lay out a village in the center of the tract.

Radical changes will be recommended in the mineral land laws, among them the following: That the time during which a prospector or discoverer shall he able to hold his claim hy possessory title shall be fixed and limited hy law; that all local organizations and regulations respecting mining titles shall be aholished and the sole jurisdiction of all questions relating thereto be reserved hy the United States; that the "lode location," which permits the discoverer to follow a lode any distance, in any direction, whether within the boundaries of his surface location or not, be repealed; that hereafter every mining claim shall comprise a certain numher of feet, breadth and length on the surface, and that suhterranean property rights shall not extend heyond the surface boundaries thus fixed. It is quite probahle that the commission may refrain for the present from making any recommendation as to the area which each location may comprise. It also recommends that a system nf official survey and mineral inspection he adopted to prevent hlackmail and rohbery, and to obviate the necessity of legal contests before claims are patented.

The Mines of Utah.

Delegate Cannon recently made the assertion in the House that more money had been put into the mines of Utah than had heen taken out. In the face of all the difficulties that have elapsed during a period of ten years in the general stagnation and depression in business, supplemented hy local embarrassments growing out of sensational rumors affecting the security of person and property, and hy a well-founded fear of hostile legislation on the part of the dominant religio-political party of the Territory, the mining interest has struggled on to the front, and Utah now stands fourth on the list of mineral States and Territories in the Union. Within the short period of ten years this great interest has leaped from helpless infancy to lusty manhood. Its aggregated production amounts to nearly $47,000,000, with an annual yield of $4,700,000, or nearly 10% on an investment of $50,000,000. We place the actual value of the mines, prospects, mills, smelters, sampling works, machinery, tramways etc., in Utah, at double the supposed actual investment, or $100,000,000, and capital invested here during these ten exceptional years has doubled in value hesides paying nearly 10% per annum nn its original investment. We believe the facts would show a much larger return. These are the direct results; it is more difficult to sum up the indirect but equally substantial benefits accruing to all classes and to the Territory at large through the development of our mines. In a material sense our mining industry furnishes life-blood to the hody politic. Within the period referred to, it has lifted Utah from poverty and isolation to wealth and influence; has helped to build and largely sustain her railroads, furnishing four-fifths of her income; has erected churches, established schools, hospitals and charitable institutions; has infused into an enterprising people elements of activity and progress, and added to the population a class of people that any community would he proud of. Close up the mines, silence the clangor of stamps, put out the firea of smelters, and Utah would revert to obscurity and insignificance.—*Exchange.*

MECHANICAL PROGRESS.

Boiler Bracing.

The Engineer-in Chief of the United States Navy, in a recent report ou experimants in boiler bracing, gives the results of some interesting trials on the strength of screw stay bolts. The averags strain in pounds required to pull the 1-inch or 1¼-inch iron bolts through the ½-inch iron plate, was as follows:

WITH SUPPORTS 4 INCHES FROM CENTER TO CENTER.

1-inch bolt, not riveted	21,970
1-inch bolt, ordinary low conical head, three threads left through for riveting	25,147
1-inch bolt, button head; length of belt left through for riveting equal to 7-16 diameter of bolt.	33,791
1¼-inch bolt, button head; length left through for riveting equal to one-half diameter of bolt	38,885

WITH SUPPORTS 5 INCHES FROM CENTER TO CENTER.

1-inch bolt, ordinary low conical head	22,137
1-inch bolt, button head; length left through for riveting equal to 7-16 diameter of bolt	31,282
1¼-inch bolt, button head; length left through for riveting equal to one-half diameter of bolt	35,812

The cause of the inferiority of the ordinary low conical head bolts is explained in the following way: It was observed that the bulging of the plates caused the lap of the rivet-head on the plate to commence giving way or break off some time before the maximum strain was reached, thus leaving more for the threads of the bolts to sustain. As the strain and bulge of the plates increased, the plate around the bolt turned downward and outward, until the threads in the plats almost entirely cleared those in the bolts, so that in almost every case there were only from one to two threads stripped or injured on the bolt when it drew ont; therefore, it was deemed advisable to form the head in a different manner, and after several experiments it was decided that the rivet-head should be made as follows: First, by having as much of the bolt through the plats as could be riveted over without injury to the iron, which was, in cass of the superior iron being used, equal in length to about one-half the diameter of the bolt.

ANTI-FRICTION CAR-AXLE BOXING.—A new style of car-axle boxing is now being introduced at the East which is described as follows: Two friction wheels are employed in the box, running in line, each having a seven-inch face and giving a leverage between their periphery and axle of 75% to overcome friction, one of them, 10½ inches in diameter, placed nearly over the axle, say at angle to a vertical line of the axle of about 15°; the other, six and one-half inches in diameter, is placed down on the side of the axle and operates as a shoulder wheel. By placing the wheels in this position the oblique action is largely done away with, sufficient oiliness being retained to hold the axle in its proper place, and not allow it to come into frictional contact with the casing. The friction wheels have steel axles journaled in brass boxing. In the casing under each of these journals is an oil reservoir for lubricating the journals through waste, oil being supplied through channels extending out to edge of housing. These channels have covers to keep out dust, grit, etc. A number of advantages are claimed by the inventor over the old style of boxing: 1. That it is the lightest running known, 50% easier than the present system. 2. An important saving in lubricant, as it runs over 1,000 miles with one oiling. 3. That heating is practically impossible. 4. Greater durability than the present system, as the friction wheels having a very broad head will not cut or make indentations. This boxing is the invention of Mr. Levi H. Montross, of Seneca, Ontario county, N. Y.

A LOCOMOTIVE ELECTRIC LIGHT.—A locomotive electric light has recently been introduced in England for railway use which is said to operate satisfactorily. It consists of a light six horse-power four-wheel locomotive, with a dynamo-electric machine attached, and any electric light may be used. When the engine is moving along the line, the electric machine rotates at its proper speed, and when it is necessary to stop in order that the light may be directed on some particular spot, the driving wheels are thrown out of gear by means of the disengaging handle attached to the pinion on the crank shaft, and the machine ceases to be a locomotive, while the engine continues to move the dynamo-machine at its proper velocity. The engine is furnished with sensitive governors, so that the speed of the dynamo-machine may be accurately regulated, this being very important in order to insure a bright and continuous light.

A CHANCE FOR INVENTORS.—There has been less inventive genius displayed in the production of machinery in the pottery business than in any other branch of manufacture under the sun. The creation of pottery is almost entirely dependent upon the manual skill of the operative potter, and the only improvement that has been made in 4,000 years is in the substitution of steam power for the hand and foot in revolving the "jigger" and throwing wheel.

TOOLS IN GLASS WORKS.—The iron tools in glass works are affirmed to be much improved by being nickel plated. They are not only better protected against rusting, but the glass does not adhere as strongly to their surfaces as to plain iron. The claim is also made that pressed work made in nickel-plated molds is sharper and smoother than in common molds.

PETROLEUM AS A FUEL FOR THE BLAST FURNACE.—Some very interesting experiments have recently been made at the Fannie furnace of the Wheeler Iron Company, West Middlesex, Mercer county, Pa., the object of which was to test a device for utilizing petroleum as fuel in blast furnaces, the first experiment of the kind made. The crude petroleum is injected into the furnace in connection with hot blast and superheated steam. The chief obstacle in the way was the difficulty of injecting the fluid petroleum into the furnace against the pressure of the blast, but this difficulty has been overcome by a very ingenious arrangement, by which the pressure of the atmosphere is made to do service. The quantity of oil consumed is said to be small in proportion to the results produced, while the steam is heated by waste gas from the top of the furnace. The experiments have not thus far proved satisfactory in all details—a black cinder being produced, while the quantity of pig has fallen off. This is attributed to the fact that the arrangements for superheating the steam are insufficient. It is not in the item of cost that the chief advantage of the process is said to lie. The inventor claims that a large quantity of the sulphur, phosphorus and other impurities in the ore are eliminated in the furnace by the use of petroleum, and that as a superior quality of iron is secured, the gain in the quality will more than compensate for the increased cost of manufacture. It is thought also that the capacity of a furnace may be increased by using the process. Further experiments will be necessary in order to settle definitely what the invention will do, but the trial thus far is stated to have resulted in a run of metal of a superior quality.

ARCHITECTS VS. UNDERWRITERS.—In a late address by Mr. Edward Atkinson, in Boston, before the Society of Arts, on "The Relation of the Architect to the Underwriter," he remarked upon the few buildings which had any adequate protection from fire; he had examined many buildings in which the motive of the architect seemed to have been to protect fire from water. He objected to iron shutters, they warped as soon as the flames struck them; wooden ones covered with tin are much more serviceable. The modern factory should have no place in it where a rat can hide its nest, or where fire cannot be reached by water. The whole construction should be open; the spaces between the beams wide, not narrow, so that water can be sent in great streams crosswise or lengthwise. The roof should be nearly flat, so as to give a standing-place upon it for the fireman; never allow furrings or plaster on the walls; never permit in a factory that the timbers be connected with the walls, so that when the beam burns off or is torn off it brings the wall down. The beams should be laid on an iron plate, with their top corners arched off, and the bricks immediately above them laid dry, so that if anything happens these beams will roll out of their places and will not tear the wall down. But the great secret is cleanliness and order, and the means of putting out small fires. As a result of these practical precautions, Mr. Atkinson said that mutual insurance association of mill owners have made cotton factories, woolen factories and paper mills better risks than stone churches, brick schoolhouses and iron warehouses, and, perhaps, better than hospitals.

STEPHEN ROPER gives the following rule for finding the safe working pressure of steam boilers: Multiply the thickness of the iron .56, if single riveted, and .70, if double riveted; multiply this product by 10,000 (safe load); then divide the last product by the external radius (less thickness of iron); the quotient will be the safe working pressure in pounds, per square inch. Example:

Diameter of boiler, 42 inches.
Thickness of iron, ¼ of an inch.
2÷42
21 external radius.
.375
20.625 internal radius.
Thickness of iron, ¼=.375
.56 single riveted.
.21000
10000 safe load.
20 625÷2100.00000
101.81 lbs. safe working pressure.

A BIG DIAMOND DRILL.—A machinist of this city, says the Virginia City (Nev.) *Enterprise*, is engaged in figuring out a diamond drill which will cut a tunnel of ordinary size. Its main feature is a rim of saw blade steel six feet in diameter and three and one-half feet in width, with diamonds set in one edge. When a cut a yard in depth has been made the drill is run back and the block of rock knocked out. The machine is really a kind of circular saw. There is a sort of center bit, also armed with diamonds, that goes a little in advance of the main saw, and makes a hole an inch and a half in diameter. This assists in giving a steadiness to the main tool, and leaves a hole in which to insert a giant powder cartridge and knock out the block of rock when a cut has been made to the proper depth. This novel drill is intended for use in hard rock only, though it may be used in soft rock were the ground is not too wet and heavy.

SCIENTIFIC PROGRESS.

Popular Confidence in Scientific Discovery.

The popular mind in its attitude towards scientific progress and discovery has undergone a wonderful change in the last five or ten years. The great facts in science brought to view by the labors of investigators, so long as they had no special practical bearing upon the affairs of every-day life, were regarded with little interest, and made no deep impression upon the mind or belief of the general reader. Statements were made in the newspapers regarding this and that new fact brought to light in some department of science or art, but the news was seldom thought of or talked about in the homes of the people in the country or city.

Important and wonderful discoveries, like the spectrum analysis of new chemical elements, or new asteroids, have interested men within the circle of those engaged in research, but outside few have taken the trouble even to inquire as to the importance or significance of the new acquisitions to human knowledge. A class of discoveries, however, which seemed to involve religious beliefs or theological dogmas quickly attracted popular attention, and brought about a fierce war of words. Mr. Darwin, when he published the results of his studies and discoveries upon the origin of species became at once a marked man and an object of popular attack. He might have been the discoverer of 50 new stars, and his name would hardly have been known beyond the circle of his associates and scientific investigators generally. His views, now almost universally admitted and adopted in the world of science, continue to be derided and combatted by theologians and laymen, and in some instances with considerable sharpness and ability. The popular confidence, so far as it is influenced by such writers, does not rest with Mr. Darwin. The stupendous problems involved in astronomical science, and upon which it rests, puzzle and bewilder the popular mind, and but a kind of half assent is given to them. When the astronomer states in a public assembly that the sun is distant 92,000,000 miles, a majority are tempted to inquire, "How do you know that?" or when he states, further, that the orb is envisaged in a vast covering of incandescent hydrogen and other forms of matter, the unspoken reply is, "It may be so." We hesitate not to say that if astronomers and mathematicians had not been able to foretell eclipses, occultations of stars, approach of comets, etc., the great facts and principles of astronomy would have occupied in the popular mind a place scarcely higher than the astrology of the ancients.

This former state of indifference and doubt has now been broken, and the pendulum swings far the other way. The popular mind is ready to believe devoutly almost anything which men of research offer for consideration. The impossible, which once was observed in every direction, now has faded from view, and science seems to work miracles as did the apostles of old. The full establishment of the telegraph in all parts of the world immensely increased the popular respect for science; but when to this are added the telephone, microphone, audiphone, phonograph, electric lighting and the numerous other recent triumphs of science and art, the possibilities of scientific accomplishment have no longer a limit. There is a danger that this extreme development of faith may lead uninformed persons into errors through misapprehension, or extravagant claims of inventors and experimenters. Owners of gas stocks and other kinds of property supposed to be influenced by new discoveries should be cautious about sacrificing their securities in consequence of what is published in the newspapers. There are still many fallacies in the world claimed to be the outgrowths of science, and a wise discrimination and reserve should be maintained in all actions based upon what is claimed as new in science and art.—*Boston Journal of Chemistry.*

Important Invention Locating Sound.

Prof. Morton, of the Stevens Institute of Technology, in his report to the Lighthouse Board, describes a new instrument called a "topophone," by which the exact direction of sounds given by fog horns or fog bells may be promptly determined. The apparatus with which experiments were made consisted of the following parts: A vertical rod passing through the roof of the deck cabin, on the upper end of which was attached a horizontal bar carrying two adjustable resonators. Below these was a pointer, set at right-angles with the above bar. Rubber tubes passed through the roof of the cabin, and connected with a pair of ear tubes. A handle attached to the vertical rod served to turn it in any direction. Provided with the apparatus above described, on board of the light-house tender, *Mistletoe*, Profs. Morton and Mayer and Mr. French proceeded, on the 10th of September last, to Sandy Hook. There they landed and caused the fog horn to be put in action, and turned to a fixed note for convenience of adjustment, and then proceeded in the *Mistletoe* to various distances from the shore, and made numerous experiments to determine how closely a person seated in the cabin could turn the apparatus so as to indicate the true direction of the sound. It was thus shown that anyone, by simply turning until the least sound was perceived, would bring the pointer to within 10 degrees, or less than one point, of the true direction. This accuracy was, of course, all that was requisite in the practical use of the apparatus. On the following day they again went in the *Mistletoe* to Eaton's Neck, on Long Island, where they repeated the same experiments with like results, finding that at distances of from four to six miles it was easy to determine the direction of the horn from the vessel to within one point. In the course of these experiments, certain improvements in detail suggested themselves, and those have been embodied in a new apparatus constructed by Mr. French, with which Prof. Mayer has been making further experiments, with a view of perfecting all the details.

DANGERS FROM THE ELECTRIC LIGHT.—It appears that the electric light is not without its dangers. Some time ago a red-hot morsel of carbon dropped from one of the lamps at the British museum to a table usually occupied by readers. Measures were at once taken to prevent the recurrence of such an accident, but not with complete success, for a few days later a similar piece of red-hot carbon fell from the center lamp to the table of the superintendent of the reading room, upon a piece of loose paper, which began to kindle into flame. This, however, was speedily extinguished. It is conceivable that a single spark might do irretrievable damage to some unique manuscript or other priceless example of literary production. Large transparent glass or talc saucers have been suspended below each lamp, so as to intercept any stray piece of carbon which may happen to fall in the future. It is even proposed to try the experiment of lighting the room from outside, in which case the glass of the central part of the dome would offer a most effectual protection.

SYNTHESIS OF MILK-SUGAR AND CANE SUGAR. On this matter E. Demole says: Setting out with the idea that the glucose molecule of cane and of milk-sugar are different, the author endeavored to take a further step in the synthesis of these sugars by combining, on the one hand, levulose with dextro-glucose, and on the other galactose with lacto-glucose. In the second case he has succeeded. Milk-sugar was first resolved into two isomeric bodies, galactose and lacto-glucose, by the action of dilute acids. The product of this reaction, after removal of the acid, was evaporated and carefully dried, and was found to possess all the properties of a mixture of equal mols. galactose and lacto-glucose. It was treated with three parts of acetic anhydride in an apparatus provided with a cohobator, and heated to the boiling point until totally dissolved. On subsequent treatment, a body was obtained possessing all the properties of octacetyl-lactose.

ACTION OF POTASSIUM PERMANGANATE UPON POTASSIUM CYANIDE.—If standard solutions of these, says E. Baudrimont, are allowed to react upon each other it will be found that the decoloration of the permanganate has a necessary limit; this decoloration is facilitated by an elevation of temperature and the concentration of liquids; its limit is attained when two equivs. KCy are in contact with five equivs. of permanganate. The action is less rapid when the liquids are acidified with sulphuric acid. The products formed by the mutual reaction of the salts differ in their proportions if not in their nature. Those whose presence has been ascertained are urea, the carbonic, nitrous, nitric, oxalic and formic acids, and ammonia, due to the decomposition of the urea. The quantity of urea increases the more the mixture is acidified with sulphuric acid.

CHLORINE IN PLANTS.—Berzelius long ago called attention to the fact (an apparently strange one) that the ashes of seeds do not contain chlorine, although they come from plants the stems and leaves of which give chlorinized ashes. A student of the French Agronomical Institute has recently explained this fact. He observes that the absence of chlorine in incinerated seeds is due to the mutual reaction of the different elements of the ash from which the chlorine is expelled. This ash, in fact, contains ammoniaco magnesian phosphate, which by calcination becomes acid phosphate of magnesia. The latter attacks the alkaline chlorides, becoming neutral, and the chlorine is eliminated. Proof of this is found in the result furnished by seeds incinerated in presence of an excess of alkali. One then finds as much chlorine as in the leaves.

A NEW ELECTRIC CANDLE.—A French inventor, M. Perruche, has presented a new description of electric candle to the Paris Academy of Science. The candle consists of three carbons, two being cylindrical and 0.004 meter in diameter, and applied to each other, the third of square section, 0.005 meter inside, and placed in the angle formed by the first two. The cylinders are in pivoted brass holders between brass plates brought together by a spring. The holder of the square carbon is also capable of oscillation, and the carbon is held by a spring in contact with the other while no circuit passes, but when the current begins takes its separate position, and is regulated by an iron lever and electro-magnet in circuit.—*Electrician.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 26.	Week Ending Mar. 4.	Week Ending Mar. 11	Week Ending Mar. 18
Alpha	8¼ 7	9 7¾	8¼ 8	8¼ 7
Alta	3.90 3.05	4.20 3.40	3.90 3¾	3.55 3.35
Andes	90c 70c	80c 60c	75c 60c	65c 45c
Alps				
Argenta	1.15 90c	75c 60c	95c 60c	70c 65c
Atlantic				
Aurora Tunnel			50c	
Baltimore Con	1¼ ¾	1¼ ¾	25c	40c 25c
Belcher	12½ 10¼	12½ 12	12½ 9¼	8¾ 5¼
Belmont	25c 20c	30c 25c	20c	20c 15c
Best & Belcher	8¾ 7	10¼ 8¾	10¼ 9¼	9¼ 8¼
Bullion	4 2	5 4.10	5¼ 4.55	4.60 4.35
Bechtel	2.05 2	2.05 2	2.35 2	2.05 2.05
Belle Isle	1.05 90c	1.10 1.05	1¼ 1¼	1¼ 1.10
Bodie	9¼ 8¼	9¼ 9	8¾ 8	8¾ 7¾
Benton	2.45 2	2.45 2	2.45 2.20	2¼ 2
Bulwer	10 8¼	9¼ 8¼	9¼ 8¼	9¼ 9
Boyle				
Black Hawk	80c 50c	80c 75c	1¼ 80c	1 70c
Belvidere	2.70 2¼	4.55 2.65	3.80 2¾	3¼ ¾
Booker	60c 50c	80c 60c	90c 60c	65c 60c
Caledonia	85c 60c	1.45 80c	1.40 1.15	1¼ 1.05
California	¾ ¾	3¼ 3.20	3.65 3.40	3.55 ¾
Challenge	1¾	1¼ 1.65	1¼ 1¾	1¾ 1.55 1¼
Chollar	6 5	6¾ 6½	6¾ 6	6 5¾
Confidence	7 6	7 7	7¼ 7	7¼ 6
Con Imperial	65c 60c	65c 55c	65c 55c	55c 55c 50c
Con Virginia	¾ ¾	3¾ 3.70	3¾ 3.60	3.60 3.40
Crown Point	4.70 3.85	4¼ 4.45	4¼ 3.40	3.30 2.80
Con Washoe				
Champion	55c 60c	50c 30c	60c 25c	40c 35c
Concordia		50c	50c 45c	50c 40c
Dayton				
DeFrees				
Daney	60c 45c	55c 50c	60c 40c	55c 40c
Day	14¼ 14	14¼ 13¾	15½ 15	17½ 14½
Eureka Con	3 2.65	3¾ 3	3.60 3	3.10 2.85
Exchequer	25c 15c	20c 15c	20c 15c	15c 10c
Endowment				
Gen Thomas				
Grand Prize	1.35 1¼	1.40 1.30	1.40 1¼	1.70 1.30
Gila		20c	25c	25c
Golden Chariot				
Golden Terra				
Goodshaw	30c 25c	30c 20c	50c 45c	40c 30c
Gould & Curry	5¾ 4¼	5¾ 4.95	6¼ 5	5¾ 4.90
Hale & Norcross	5¾ 5¼	7 5¾	6¾ 5¾	5¾ 6¼
Hillside	1.10 1	1¼ 1	1.40 1.10	1¼ 75c
Highrider				
Homestake				
Hussey				
Independence	1.20 85c	90c	1¼	1¼ 1.20 1
Julia	1.60 1¼	1.65 1¼	1.40	1¼ 1.15 1.05
Justice	1.80 1.15	1¾ 1.30	1.55 1	1.80 1¼
Jackson	2	2	2¼ 2	4 3¼
Joe Scates				
K K Con	5¼ 4	5 4	3	3¼ 3¼
Kentuck	3¾ 3	3¾ 3	3¼ 3	3
Kossuth	15c	15c		10c
Keystone				
Lady Bryan	50c 30c	60c 35c	50c 30c	40c 5c
Lady Wash	70c 55c	80c 65c	75c 65c	60c
Leopard	15c	15c 10c	10c	10c
Leviathan	20c 15c	15c 10c	15c 10c	15c 10c
Leeds	50c	60c	50c	60c 50c
Lee		35 Modoc	40c	
May Belle	20c	25c 20c	35c 25c	20c
Modoc	45c 40c	40c	40c	40c
Manhattan	1½ 1.40	1¼	1.55 1.30	1 90c
Martin White	90c 80c	90c 85c	85c 75c	75c
McClinton	50c 35c	70c 45c	1 65c	80c 65c
Meadow Valley				
Mexican	15½ 12½	16 14½	16½ 14½	14½ 13¾
Mides				
Morning Star				
North Con Virginia				
New York	40c 30c	45c 35c	40c 35c	45c 35c
Northern Belle	16½ 15	16½ 15½	16½ 16	18 16½
New Coso				
Navajo	30c 25c	30c 25c	30c	35c 30c
Occidental	1.30 1	1.10 1	1.05 90c	90c 70c
Ophir	17¼ 14¼	18 17	18¾ 17½	18¾ 17
Oriental	40c 30c			
Overman	6¾ 5¼	6¾ 6¾	6¾ 5	5¼ 1.95
Panther				
Phenix			2	1
Phil Sheridan	15c	20c	20c	4
Potosi	3.70 2	4.85 3.40	4.65 4	4.30 4¼
Pride				
Raymond & Ely	80c 60c	1 50c	1 95c	1 85c
Richer				
Rock Island				
Rye Patch				
Rough & Ready				30c
Savage	5¾ 4¼	6¾ 5¾	6¾ 5	5¾ 5
Seg Belcher	19 15	16	17¾ 17	18 14
Sierra Nevada	22¼ 20¾	23¼ 22	23¾ 21¾	21¼ 20¾
Silver Hill	1.05 80c	1.10 90c	1 75c	1 75c
Silver King	7	7	7	7 6
Silver Prize				
Succor				
Summit	1.10 1	1¼ 1	2 1¼	1¼ 1.10
Scorpion	3.05 2.80	3.10 3	3¼ 3	3 2.80
Solid Silver	5c	10c		40c 20c
South Bodie	70c 65c	85c 60c	80c 75c	75c 60c
South Standard	30c 25c	30c 25c	35c 20c	25c 20c
Star	20c	25c	20c 20c	25c 20c
St. Louis				
Syndicate	1¼ 1	1.45 1.30	1¾ 1¼	1.60 1.35
Tioga Con	2.85 2¼	2¾ 2¼	3 2¾	2.70 2.30
Tiptop	4.25 4¼	5¼ 4.60	5 4¼	4.30 4¼
Trojan	35c 15c	15c	15c 10c	
Union Con	33¾ 30	37¼ 32½	40¼ 36¼	37 35
Utah	11¼ 10¼	12 11	12 10¼	10¼ 9¼
Vermont Con				
Ward	1.60	1¾ 1.60	2	1¾ 1.65 1¼
Wells-Fargo	5c	5c	5c	5c
Woodville				
White Cloud				
Yellow Jacket	8¾ 6¾	9¼ 8¾	9¼ 8¾	8¾ 7¾

Sales at S. F. Stock Exchange.

Friday A. M., Mar. 12.

40 Alta 3.40
40 Alpha ..... 8@7¾
355 Andes ..... 45@55c
2620 Belcher ..... 8@8¾
125 Best & Belcher 9¼
500 Baltimore Con 30c
315 Benton ..... 2@2.10
180 Bullion 4.60
160 Caledonia 1.05
600 Con Imperial 60c
10 California 3.55
470 Crown Point ..... 3@3.30
15 Challenge 1.55
100 C Dorado 1.35
105 Con Virginia ..... 3.55@3¾
210 Chollar ..... 5¾@5¾
50 Essex 1¼
180 Exchequer 3
100 Flowery 20c
250 Gould & Curry ..... 5@4.90
630 Golden Gate 70c
30 Hale & Nor 5¾
165 Julia 1.10
200 Justice ..... 1.55@1¼
10 Kossuth 10c
400 Kentuck 3
375 Leviathan 10c
200 Lady Bryan 40c
80 Mexican ..... 14¼@14
175 Mackey 15c
175 N Bonanza 40c
260 New York ..... 35c@36c
70 Ophir ..... 17@17¼
120 Overman ..... 5¾@5¾
410 Potosi 4.10
210 Savage ..... 5¼@5¾
580 Silver Hill 75c
10 Seg Belcher 14
120 Scorpion 3
410 Sierra Nevada ..... 21¼@21½
5 Utah 10
170 Union Con ..... 35@35¼
90 Yellow Jacket ..... 8¼@7¾

AFTERNOON SESSION.

500 Alblon 30c
200 Addenda 60c
100 S Bulwer 1¼
150 Star 20c
150 S Bodie 70c
500 S Standard 25c
140 Tiptop 4¼
750 Tioga ..... 2.30@2.45
600 University 25c
20 Wales 3.10

Saturday A. M., Mar. 13.

20 Alpha ..... 7¼@7½
10 Alta 3.35
420 Andes 55c
550 Argenta ..... 65@70c
100 Albion 30c
300 Addenda ..... 60@65c
265 Best & Belcher ..... 8¾@8½
3045 Belcher ..... 6¼@6¾
325 Bullion ..... 4.40@4.45
980 Baltimore Con 30c
100 Belmont 2.20
200 Belmont 15c
500 Belding 1
10 Belle Isle 1.20
100 Bodie 8
50 Bechtel 2.05
50 Bulwer 9
300 Belvidere ..... 3.70@3¾
100 Black Hawk 85c
100 Booker 65c
100 Boston ..... 1.20@1.15
370 California ..... 3.35@3.30
400 Concordia 50c
300 Champion 40c
355 C Pacific 2.90
100 Dudley ..... 75c@70c
900 Day ..... 50@40c
1050 D Standard ..... 1@1.10
60 Exchequer 2.85
560 Eureka Con ..... 15@14¾
250 E M Diablo ..... 1.40@1.35
350 Endowment 15c
50 Essex 1¼
300 Fairfax 60c
150 Flowery ..... 20@25c
175 Gould & Curry ..... 4.95@4.90
450 Golden Gate 70c
395 Grand Prize ..... 1.35@1.40
100 Goodshaw 35c
80 Hillside 90c
100 Holmes 1½
240 H & Norcross ..... 5¼@5¾
100 Independence 1.20
510 Justice ..... 1¼@1.55
900 Julia ..... 1.10@1.15
20 Jackson 3¼
755 Jupiter 2¾
450 Kentuck 3
400 K K Con 3¼
510 Leopard 10c
20 Lady Bryan 25c
550 Lady Wash 60c
75 Leviathan 10c
360 Mexican ..... 14@13¾
65 Modoc 45c
100 Manhattan 1
250 Metallic 2
100 Mt Potosi 1¾
100 Mt Diablo 1
35 Modoc 40c
150 McClinton 75c
160 Mono ..... 7@6¾
100 Martin White 75c
550 Mammoth ..... 1.80@1.65
300 Navajo 30c
500 New York 35c
120 N Bonanza 40c
40 Northern Belle 16¼
500 N Belle Is 35c
235 Ophir ..... 17¼@17
35 Overman 5¼
50 Occidental 80c
1000 Orient 6c
120 Oro ..... 1.70@1¾
370 Potosi ..... 3.90@3¾
350 Queen Bee 35c
90 Raymond & E ..... 95@85c
235 Savage ..... 5¼@5¾
420 Sierra Nevada ..... 21@20¾
10 Seg Belcher 14
300 Silver Hill ..... 85@80c
50 Solid Silver 20c
85 Scorpion ..... 3@2.90
200 Star ..... 25@20c
150 Syndicate 1¼
400 S Bodie ..... 70@75c
650 S Standard ..... 20@25c
1100 S Bulwer ..... 1.70@1.80
10 Silver King 7
350 Tiptop 4¼
255 Union Con ..... 36¼@36
50 Utah ..... 10@9¾
200 Ward 1¾
20 Wales 3.10
340 Yellow Jacket ..... 7¾@7¼

Monday A. M., Mar. 15.

15 Alta 3.35
275 Alpha 7
85 Andes ..... 60@65c
160 Best & Belcher ..... 8¾@9
250 Benton ..... 2.05@2.10
480 Baltimore Con 30c
190 Bullion ..... 4.40@4¼
4125 Belcher ..... 6@5¾
10 Confidence 6¾
50 Challenge 1¼
30 Caledonia 1.05
360 California ..... 3.35@3¼
210 Con Virginia 3.55
380 Chollar ..... 5¾@5¾
860 C Dorado ..... 1.35@1.40
735 Crown Point ..... 3.05@3
1060 Con Imperial ..... 55@50c
50 Essex 1¼
150 Exchequer 3.10
210 Fairfax ..... 60@75c
100 Flowery 20c
75 Gould & Curry 5¼
350 Golden Gate 70c
220 Hale & Nor ..... 5¾@5¾
220 Julia ..... 1.05@1.10
969 Justice ..... 1.55@1.70
200 Leviathan 15c
90 Mexican ..... 14¼@14
150 N Bonanza 40c
10 New York 35c
100 Occidental 75c
75 Ophir ..... 17¿@18
30 Overman 5¼
70 Potosi 3.80
155 Scorpion ..... 3@2.80
50 Solid Silver 25c
25 Silver Hill 80c
115 Sierra Nevada ..... 21¼@21¾
40 Utah ..... 9¼@9¾
175 Union Con 37
50 Ward 1¼
20 Yellow Jacket 7

AFTERNOON SESSION.

140 Argenta ..... 65@70c
300 Albion 30c
700 Atlas 5c
250 Addenda 65c
100 Belding 1
70 Bulwer 9¼
200 Black Hawk ..... 80@85c
1250 Belcher 5¾
200 Belvidere ..... 3.55@3¾
10 Belle Isle 1¼
85 Bodie ..... 8@7¾
50 Bechtel 2.05
250 Boston ..... 1.20@1.25
340 Belmont 20c
200 Champion 35c
340 Concordia 50c
135 C Pacific ..... 2@2¼
50 Caledonia (BH) 2.60
200 Dudley 70c
600 D Standard ..... 1@1.05
800 Day ..... 50@45c
90 Endowment 10c
250 E M Diablo ..... 1.35@1.30
376 Grand Prize 1.40
300 Goodshaw 35c
460 Holmes 1½
500 Hillside 95c
505 Jupiter ..... 2¼@2.45
100 K K Con 3¼
1100 Leopard 10c
10 Leeds 50c
100 Mono ..... 7@6¾
375 Mammoth 1¼
700 McClinton 70c
100 Mayflower 20c
160 Paradise 65c
325 Queen Bee 30c
125 Raymond & Ely 1
100 S Bulwer 1.70
100 S Bodie 60c
100 S Standard 25c
100 Star 20c
100 Summit 1.10
93 Syndicate 1.60
100 Sierra Nevada 21½
860 Tiptop 4.30
40 Tioga Con 2.55
150 University 25c
1210 Wales 3¼

Tuesday A. M., Mar. 16.

40 Alta 3¼
320 Andes ..... 65@60c
130 Alpha ..... 8@7¾
1180 Belcher ..... 5¾@5¾
90 Benton ..... 2.05@2.10
100 Baltimore Con 35c
230 Bullion ..... 4.35@4.40
85 Best & Belcher ..... 8¾@8¼
85 California 3.35
145 Caledonia ..... 1.15@1.10
200 Con Dorado 1.40
200 Con Imperial ..... 55@50c
300 Crown Point ..... 2.80@2.85
50 Con Virginia 3.60
210 Chollar 5¾
100 Essex 1¼
100 Exchequer ..... 2.90@2.95
450 Fairfax ..... 40@35c
410 Flowery 15c
450 Golden Gate 70c
210 Gould & Curry 5
930 H & Norcross 5¾
155 Julia 1.15
695 Justice ..... 1.70@1.80
20 Kentuck 3
100 Mackey 15c
305 Mexican ..... 13¾@13¾
300 N Bonanza ..... 40@45c
340 New York ..... 40@35c
340 Ophir ..... 17¼@17¾
105 Overman 5¼
50 Potosi 4
70 Savage ..... 5¼@5¾
290 Scorpion 2.85
100 Silver Hill ..... 80@85c
165 Sierra Nevada ..... 21@20¾
70 Utah ..... 10@10¼
160 Union Con ..... 35¼@35¾
530 Ward 1¼
160 Yellow Jacket ..... 7¾@7¼

AFTERNOON SESSION.

580 Albion ..... 30@25c
300 Addenda 65c
400 Atlas 10c
360 Belcher ..... 5¾@5¾
340 Black Hawk 80c
200 Belvidere ..... 3.55@3¾
190 Bulwer ..... 9¼@9¾
240 Bodie ..... 7¾@7¾
750 Belding 1
100 Boston 1.15
50 Champion 35c
300 Concordia 50c
50 C Pacific 3
1170 Day ..... 50@40c
1575 D Standard ..... 1@1.10
300 Dudley 70c
130 Eureka Con ..... 17@17¼
80 E M Diablo 1.30
1400 Endowment 15c
50 Gila 25c
840 Grand Prize ..... 1¼@1.40
150 Goodshaw ..... 30@35c
700 Hillside 1
200 Holmes ..... 1¼@1.40
100 Independence 1.10
150 Jupiter ..... 2¼@2.45
350 Leopard 10c
560 Metallic ..... 2@2.05
60 Mono 7
100 Mt Potosi 1.60
375 McClinton ..... 75@65c
140 Manhattan 90c
200 Martin White 75c
255 Mammoth ..... 1¼@1.65
50 Mt Diablo 22
205 N Belle Is ..... 35@50c
55 Northern Belle ..... 17¼@17¾
30 Noonday 3.10
130 Occidental ..... 1.65@1.70
650 Orient 5c
250 Paradise 65c
250 Rough & Ready 30c
95 Raymond & Ely 1
370 Syndicate ..... 1¼@1.35
100 Summit 1¼
350 S Bulwer 1¼
100 Silver King 6¾
210 Tioga Con ..... 2.60@2.65
400 University 25c
20 Wales ..... 3¼@3

Wed'sday A.M., Mar. 17.

70 Alpha 8¼
30 Alta 3.40
230 Andes ..... 65@60c
40 Best & Belcher ..... 9¼@9¾
160 Benton 2.10
50 Baltimore Con 35c
10 Bullion 4.50
1505 Belcher ..... 5¾@5¾
90 Con Imperial 50c
605 Con Virginia ..... 3¼@3.55
170 Chollar ..... 5¾@6
200 Confidence 6¾
10 Confidence 6¾
250 C Dorado 1.40
140 California ..... 3.35@3.30
260 Caledonia ..... 1.20@1.15
255 Essex 1.90
250 Exchequer 3.10
520 Flowery ..... 15@20c
250 Golden Gate 70c
80 Gould & Curry 5
160 Hale & Nor 5¾
310 Justice ..... 1.80@1.70
60 Julia 1.10
100 L Bryan 5c
80 Mexican ..... 14¼@14¾
100 Mackey 15c
450 New York 35c
350 N Bonanza ..... 45@50c
50 Ophir ..... 17¾@17¾
120 Overman ..... 5¾@5¾
120 Occidental ..... 75@70c
400 Pioneer 15c
100 Potosi 4.05
50 Savage 5¾
50 Solid Silver 40c
200 Silver Hill ..... 90c@1
200 Scorpion ..... 2.95@3
166 Sierra Nevada ..... 21¼@21¾
50 Utah 10¼
100 Union Con ..... 36¼@36¾
105 Yellow Jacket ..... 7¾@7¼

AFTERNOON SESSION.

125 Argenta ..... 65@70c
220 Albion ..... 30@25c
200 Addenda 70c
700 Atlas 10c
250 Belvidere 3¾
15 Black Hawk 70c
50 Boston 1.10
300 Booker 60c
750 Belding ..... 75c@1
10 Bodie 7¾
310 Belle Isle ..... 1.20@1.10
200 Bechtel 2.05
200 Champion ..... 35c@40c
200 Concordia 50c
50 C Pacific ..... 2¼@2¾

150 D Staodard 1.20
100 Dudley ..... 80@85c
200 Day 55c
360 E M Diablo ..... 1.30@1¼
500 Endowment 15c
400 Eureka Con ..... 17¼@17½
550 Goodshaw 35c
300 Grand Prize ..... 1¼@1.70
260 Holmes ..... 1.40@1¼
300 Hillside 85c
200 Independence 1.05
20 Jackson 3¼
285 Jupiter ..... 2.40@2.30
300 Leeds 60c
350 Leopard 10c
120 Mt Potosi ..... 1.60@1.65
100 Manhattan 1
200 Martin White 75c
80 Mono 7

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Mar. 11.

165 Alta ..... 3.60@3¾
100 Andes ..... 50@55c
10 Alpha 8¾
145 B & Belcher 9¾
1850 Bullion ..... 4.60@4.70
1070 Belcher ..... 9¼@9½
60 Benton ..... 2.20@2¼
580 Baltimore Con 25c
185 Con Virginia ..... 3¾@3.60
310 California 3.40
25 Chollar 5¾
1120 Con Imperial ..... 55@60c
330 Crown Point ..... 3.40@3.45
130 C Dorado 1.35
110 Caledonia 1.15
200 Exchequer ..... 3.05@3.10
1000 Fairfax 60c
100 Flowery 20c
25 Gould & Curry 5
500 Golden Gate 70c
140 Hale & Nor ..... 5¾@5¾
700 Julia ..... 1.15@1.20
805 Justice 1.55
200 Kentuck 3
475 Lcviathan ..... 10@15c
190 Lady Wash ..... 70@65c
210 Lady Bryan ..... 50c@45c
285 Mexican ..... 14¿@15
250 N Bonanza ..... 45@40c
80 Overman ..... 5¼@5
220 Ophir 17¼
160 Potosi ..... 4.20@4.10
350 Savage 5¾
95 Scorpion 3.10
440 Silver Hill ..... 85@75c
440 Sierra Nevada ..... 21¼@20¾
150 Trojan 10c
1400 Utah ..... 10¼@10½
130 Union ..... 36¼@36¾
700 Wells-Fargo 5c
380 Ward ..... 1¼@1.55
390 Yellow Jacket ..... 8¼@8¾

AFTERNOON SESSION.

300 Albion 30c
380 Argenta ..... 60@65c
300 Altas 10c
200 Addenda 65c
75 Belmont 15c
100 Boston 1¼
80 Black Hawk ..... 1@95c
295 Mammoth ..... 1¿@1.70
200 Metallic ..... 2.20@2¼
450 McClinton 75c
285 Northern Belle ..... 18@17¿
30 Noonday 3.60
120 Oro 1.70
50 Paradise 65c
100 Queen Bee 25c
100 S Standard 20c
770 S Bulwer ..... 1¿@1.60
200 Silver King ..... 6¿@6
100 S Bodie 65c
100 Star 20c
125 Summit 1¼
300 Syndicate 1.40
20 Tioga 2.70
100 University 25c
570 Wales 3.35

Thursd'y A.M., Mar. 18.

100 Andes 65c
150 Alta 3.55
20 Best & Belcher 9¾
675 Bullion ..... 4.40@4.45
600 Baltimore Con 40c
1175 Belcher ..... 6@6¼
100 Benton 2¼
430 Crown Point ..... 3¼@3.20
405 Con Imperial 55c
300 Con Virginia ..... 3¼@3.40
225 Chollar 6
130 Caledonia 1¼
85 Exchequer ..... 3.05@3.10
200 Fairfax 60c
500 Flowery 15c
90 Gould & Curry 5¼
150 Golden Gate 70c
50 Hale & Nor 5¾
200 Justice ..... 1.15@1.10
1050 Leviathan 10c
100 Lady Wash 60c
295 Mexican ..... 14¿@14¾
100 Mackey 15c
200 New York ..... 40@45c
200 N Bonanza 50c
240 Ophir ..... 18¿@18¾
200 Occidental ..... 90@85c
110 Overman ..... 1.95@2
200 Pioneer 15c
100 Potosi ..... 4.30@4¼
100 Seg Belcher 18
170 Silver Hill ..... 90@85c
275 Sierra Nevada ..... 21¿@20¾
50 Savage ..... 5¼@5¾
225 Union Con ..... 36¼@36¾
50 Ward 1.65
380 Yellow Jacket 7¾

AFTERNOON SESSION.

130 Argenta ..... 65@70c
200 Addenda ..... 70@65c
100 Altas 10c
100 Albion 25c
10 Bulwer 9¼
560 Beehtel ..... 2.05@2
160 Boston 1.15
360 Belvidere ..... 3¼@3.35
235 Belle Isle ..... 1.20@1.15
200 Booker ..... 60@65c
800 Black Hawk ..... 60@65c
160 Belmont 15c
415 Champion ..... 40@35c
510 C Pacific ..... 2¼@2¾
250 Concordia ..... 50@75c
850 Day 65c
650 D Standard ..... 1.10@1.20
259 Endowment 15c
550 E Mt Diablo ..... 1.35@1.40
50 Endowment ..... 1.30@1.20
220 Graud Prize 1.85
30 Gila 20c
160 Goodshaw ..... 35@30c
100 Independence 1
243 Jackson 3¼
865 Jupiter ..... 2.10@2¼
375 Jupiter ..... 2.40@2¿
50 Leeds 50c
1200 Leopard 10c
55 Mammoth 1.90
830 McClinton 70c
100 Mt Potosi ..... 1.60@1¿
100 Manhattan 90c
270 Metallic 2.10
80 Northern Belle ..... 18¼@18¿
200 Navajo 35c
200 Noonday 3.10
400 Navajo ..... 30@35c
50 Noonday 3¼
80 N Noonday ..... 2¿@2.90
1950 Oro ..... 1¾@1.60
200 Oricut 5c
100 Raymond & Ely 1
75 Summit 1¼
1025 S Bodie ..... 65@50c
210 Silver King ..... 6@6¼
80 Syndicate 1¼
200 S Bulwer 1.40
250 Tiptop ..... 4¼@4.15
100 Tuscarora 50c
140 Tioga Con ..... 2.70@2¿
130 Wales 3.40

California Board—Latest Sales.

Wed'sday A.M., Mar. 17.

1400 Atlantic ..... 4@3c
250 Atlanta 7c
20 Alta ..... 3¿
120 Andes 80c
100 Argenta 65c
70 Belcher ..... 5¼@5¾
30 Best & Belcher 9¼
130 Bullion 4.55
100 Caledonia 1.05
250 Curtiss ..... 60@62½c
20 California 3.30
30 Con Virginia 3¼
200 Con Imperial 50c
30 Crown Point 2.95
30 Hale & Nor 5¾
30 Julia ..... 1.10@1.15
20 Justice 1.80
20 Medican 14¼
100 N Sierra Nevada 6c
20 Ophir ..... 17¼@17¿
10 Savage 5¼
30 Sierra Nevada ..... 21¼@21¾
100 South Bodie 60c
200 Trojan 10c
20 Union ..... 36¼@36¾
20 Ward 1¼
200 W Comstock ..... 12¿c

AFTERNOON SESSION.

300 Atlanta 7c
250 Ætna 5c
10 Alpha 8¾
20 Alta 3¾
100 Andes 80c
110 Belcher ..... 5¿@5¾
20 Best & Belcher 9¼
500 Bodie Q ..... 35@37½c
30 Bullion 4¼
175 Curtiss ..... 65@62½c
10 Confidence 6
20 Chollar 6
30 Con Virginia 3¼
100 Con Imperial 50c

20	Crown Point	2.90	3.00
160	Goodshaw	31c	32c
120	Julia	1.15	1.20
125	Justice	1.70@1.75	
100	Leviathan	10c	12½c
20	Mexican	14@14½	
10	Ophir	17½	18
10	Overman	5	6
150	Orient	4@5c	200

20	Potosi	4.05@4.07½	
30	Sierra Nevada	21½@21¾	
120	Silver Hill	98c	
100	S Bodie	77c	
100	Trojan	12½c	
20	Union Con	35½@36	
20	Ward	1¼	
60	Wales	3.30@3.35	
200	W Comstock	12½c	

Pacific Board—Latest Sales.

Wed'sday A.M., Mar. 17.

170	Andes	6@6.5c	
2250	Atlas	9@10c	
180	Belcher	5½@5¾	
360	Bullion	4.60@4.65	
240	Crown Point	2.95@3	
500	Con Imperial	52c	
220	Con Virginia	3.55	
200	California	3.35	
190	Colorado	3¼	
160	Caledonia	1.15	
20	Exchequer	3	
150	Gould & Curry	51@55	
200	Hale & Nor	5½	
130	Justice	1.80	
100	Mono	6	
250	Mexican	14½@14¾	
220	Ophir	17½@17¾	

20	Overman	5¼	
100	Potosi	4.60	
800	St Patrick	90c@1	
20	Savage	53	
120	S Nevada	21@21½	
20	Union Con	36	
100	Yellow Jacket	74	

AFTERNOON SESSION.

50	Bullion	4.45	
10	Exchequer	2.95	
150	Justice	1.80@1.81	
30	Julia	1.10@1.20	
200	L Bryan	15c@20c	
240	Mexican	14½@14¾	
100	Mammoth	2	
90	Savage	5.30@5.35	
60	Sierra Nevada	21¼	
200	St Patrick	1.05	

Mining Share Market.

During the week there has been some light ripples upon the surface of the otherwiso stagnant pool of stock operations, but toward its closo a more hopeful feeling has been felt, owing to the defeat of the Gorley mining bill, and the consequent belief that there is a sufficient conservative and intelligent element in the Legislature to prevent the onactment of any really ultra laws.

With such unlimited mining resources as this coast possesses, there should be a rapidly progressing husiness in that channel, and a corresponding increase in the wealth of the people derived from this source. It certainly would stimulate all other industries, and find in its own operatious a very wide field for the employment of labor.

Shares in the Eureka Con. mine have been in demand this week, probably owing to the strike in the Dunderberg mine in the same district, where there are now five honanzas being worked.

Even in New York, mining stock matters are rather quiet at present, and of late there have been fewer arrivals from this coast. Only 10% or 15% of the 130 hrokers who have organized the new hoard are Californians. The valuable dividend mines are meeting with a satisfactory market, but there will not be much animation in stocks before May or June, when the new board will he in active operation.

Bullion Shipments.*

Since our last issue, we have noticed the following hullion shipments :

Richmond, Mar. 9, $14,756.36; Mar. 11, $10,599.68; Mar. 13, $12,228.87; Ontario, Mar. 8, $12,115.12; Mar. 10, $5,008.94; Horn Silver, Mar. 8, $5,000; Utah Southern Road, shipped over it in Feb. 2,537,083 lbs. of silver-lead bullion and 2,934,980 lbs. of ore; Paradise, Mar. 8, $3,570; Mar. 12, $3,300; Eureka Con., Mar. 10, 24,835 lbs.; Mar. 13, 27,853 lbs.; Wells, Fargo & Co., at Eureka, Mar. 10, $1,000; Mar. 12, $2,229.93; Mar. 11, $3,100; Mar. 13, $1,000; McCormick & Co., received Mar. 9, $7,650; Mar. 10, $5,680; Mar. 11, $6,050; Mar. 13, $17,580; Barbee & Walker, Mar. 9, $2,049.67; Standard, Mar. 8, $45,941.75; Bodie, Mar. 8, $16,481.88; Noonday, Mar. 8, $10,125.19; Silver Belt, Mar. 1, 11,800 lbs.; value, $800 per ton; Christy, Mar. 10, $1,609.44; Mar. 12, $1,882.56; Northern Belle, Mar. 10, $3,544; Tough Nut, Mar. 11 (one week), $16,000; for Feh., $58,290; Alexander, Mar. 1, $3,024.10; Mar. 3, $4,005.66; Mar. 5, $1,086.60;

*Desiring to make our list of Bullion Shipments as complete as possihle, we will he thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

IMPORTANT DECISION.—Judge Lorenzo Sawyer, of the United States Circuit Court, on Saturday, the 13th inst., after a hearing of a motion therefor, granted an injunction in favor of the California Artificial Stone Paving Company against W. S. Perine, enjoining the said Perine from laying down cement pavement separated into blocks hy joints, the joints being formed by cutting the plastic material with a trowel or any other cutting instrument. The defendant contended that, as he did not permanently interpose tar-paper between the blocks of plastic cement, he did not infringe the complainant's patent.

DENIS KEARNEY was arrested last week on a charge of misdemeanor in violating a city ordinance forbidding the puhlic utterance of profane and vulgar language. He was arrested and hailed. At the trial he was found guilty and sentenced to pay a fine of $1,000 and six months imprisonment in the House of Correction. He appealed to the Superior Court and is now at large on hail of $3,000.

FERDINAND DE LESSEPS, the distinguished engineer of the Suez canal, arrived in this city this week on husiness connected with the proposed inter-oceanic canal at the Isthmus of Panama. M. de Lesseps seems, so far, to have made a favorahle impression with the citizens of San Francisco.

SECRETARY SHERMAN declines to retire from the Presidential race.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MINING NOTES.—*Ledger*, Mar. 13: Allen Tibbets has fixed up his five-stamp mill on the Iowa claim, at Sutter Creek, to run by water power. The ditch and pipe are of sufficient capacity to carry water enough to run a mill of 20 stamps. He calculates the five stamps to crush eight or nine tons in 24 hours. The Oneida mill started 40 stamps on Monday. The same day the prospecting operations, which have been carried on for some months, were discontinued. They resulted in no discoverice of value. The mill is kept running on ore from the upper levels. The outlook is not as encouraging as it might he. The Zelle mill was started Tuesday with 20 stamps. It is running with steam power, but Knight & Co. have contracted to put in water power within two weeks. The machinery runs beautifully. The Yellow Jacket has struck a fine ledge five ft wide, which contains some very rich rock.

BUTTE.

CHEROKEE.—*Register*, Mar. 12: A gold bar, weighing 175 pounds and valued at $50,000, was forwarded through Wells, Fargo & Co. to the United States mint at San Francisco. This bar, although a pretty good-sized one, weighed 87 pounds less than one shipped last summer.

A GOOD NUGGET.—*Mercury*, Mar. 12: Mr. Miller picked up, in Riley ravine, a piece of white porphyry quartz, two inches square by a half inch thick, which yielded $25 in gold. This find has created quite an excitement, and many new claims will he located as soon as the weather moderates.

CALAVERAS.

GRAVEL MINING.—*Chronicle*, Mar. 13: At the Safe Deposit, in Old Woman's gulch, the batteries are kept constantly supplied with gravel, results being favorable. The Rough Diamond, in Chile gulch, another "mill" claim, is being actively operated. The Oreen Mountain tunnel is a steadily paying property—one of the most reliable claims in the district. At the Duryea hydraulic the work of "stripping" is finished and "piping bottom" is to he commenced immediately. In the futuro the discharge from the claim will be through the tunnel at the southern end of the mine. The Bonanza has just concluded a clean-up, a hig one, and piping on a large scale is to he recommenced as early as possible. During the late cold weather the Champion mills, West Point, have been running on "refuse rock," a grade of quartz that it has been the custom to throw away. The yield, although not large, was sufficient to pay all expenses, with a handsome margin for profit. We saw several thousand dollars worth of bullion extracted from such rock in the assay office of C. Schlund. No more of such rock will be thrown away.

EL DORADO.

RICH SILVER STRIKE.—Placerville *Democrat*, Mar. 6: The scene of the new discovery is in Kelsey township, a short distance from the town of Kelsey. At the southern extremity is a round knoll, 400 ft in diameter, compactly covered with huge quartz houlders. Running thence 1,100 ft due north, crossing a ravine in its course, is a large, strong and well-defined ledge, from 8 to 10 ft wide at the surface, which at its northernmost point connects with a like ledge of similar dimensions that runs due east, and has been traced a distance of 1,200 ft. These two are joined at their point of intersection by another ledge or spur, that comes in from the southeast, which is from three to four ft wide and has been traced a distance of about 400 ft. From time to time, for 25 years or more, these ledges have been superficially prospected for gold, but never with encouraging results. Dr. Alderman has a chronic habit of "puttiug in odd hours on rainy days" in assaying fragments of quartz picked up in his vicinity. A few days ago, after indulging this habit on a few fragments from the ledge under considcration, he was no less astonished than delighted to find a rich prospect in gold and silver, the latter largely predominating. Encouraged thereby, he procured average samples from the knoll and from various points along the ledges, and made 32 assays, all of which were nearly uniform in their results, the lowest assay yielding at the rate of $110, and the highest at the rate of $159 per ton in hullion worth about $5 to $6 per ounce, a considerable percentage of it being gold.

FRESNO.

MINING ITEMS.—*Expositor*, Mar. 13: At Fresno Flats several important discoveries have recently been made. Mr. Phelps has sunk a shaft to the depth of 50 ft on his newly-discovered mine, and proposes to get it down to 100 ft. The ledge varies from two to four ft in width, and shows an abundance of free gold. Another rich strike has recently heen made in the lower level of the Fresno Enterprise. A large hody of ore, worth from $300 to $400 per ton was disclosed. Two arastras are running steadily on the richest ore, that not paying over $50 or $80 per ton heing thrown in the dump, to he worked in the future. About $40,000 in hullion was recently shipped from the mine.

LAKE.

INCENDIARISM.—Lower Lake *Bulletin*, Mar. 13: The furnace erected hy Dr. Baker on his cinnabar mine, in the Soda canyon, five miles helow our towu, was hurnt to the ground hetween 9 and 11 o'clock last Sunday evening. Loss, $3,000; no insurance.

MONO.

NOONDAY.—*Chronicle*, Mar. 13: The east crosscut, 500 level, is in 240 ft. The crosscut from the 400 level is in 242 ft, at which point a nice ledge was cut, and are now running on it north and south. On the west ledge, 400 level, have run north 64 ft and south 71 ft. There is 20 inches of good ore in each of these drifts. The winze to connect the 300 level with the 400 is down 103 ft, showing a fine, strong vein all the way down. Driving north on No. 1 vein, on 300 level, and now in 480 ft.

BOOKER.—Driving the crosscut on the 400 level, north and south, and in about 46 ft each way. The vein is looking well, and is from two to four ft thick.

BOSTON CON.—The north drift on the 200 level is in 61 ft, carrying a vein three ft thick, the ore heing of good milling quality. The south drift is in 53 ft. The hody of ore is proven 110 ft, and the vein averages three ft. The incline shaft is now 34 ft helow the 200 level.

ORIONAL SUMMIT.—Sinking the shaft, which is now down 112 ft. When 200 ft is reached, crosscutting will be resumed again. In the crosscut on the 100 level the vein is some 12 or 16 inches wide, and looks very flattering.

BLACKHAWK.—The shaft is down 600 ft. The small veins that have followed the shaft still continue with it, and show a slight improvement. At the 700 level will open another station, and crosscut east and west will he started. The winze on the 320 level is down 85 ft. The vein continues 20 inches wide.

CON. PACIFIC.—An engine and hlower is heing added to the machinery to convey air to the 400 and 500 levels, and a cage, of the latest improved pattern, will he running in the shaft. Stations at the 400 and 500 levels are completed, and drifting and crosscutting for ore veins will he carried forward until the large slice of the valuahle mineral belt covered by the several claims of this company is thoroughly explored.

KING BEE.—*News*, Mar. 14: The shaft is down 165 ft. At 150 ft a very fine ledge was cut, two ft wide, of bright, lively quartz, with well-defined walls, and the assaye averaging $131.13, taken from across the face. This ledge is pitching to the east at an angle of ahout 80°. After passing through this vein and to the hottom of the shaft, stringers and seams of rich clay and quartz from an inch to four or five inches thick, that born out free gold in quantities beyond belief, have been continually coming in the shaft. At the hottom a seam that came in like a knife-hlade is now four inches thick, of the richest character of ore. The tunnel is 140 ft helow the moutb of the shaft and 250 ft north of it. For the first 100 ft the formation is hard cap rock. At this point the formation changes to a vein porphyry; that continues for 280 ft, when hard rock is met and continues as far as run, 32 ft. In the vein porphyry five distinct ledges have been cut, each having well-defined walls and pitching to a common center at the east. The first vein cut in the regular formation is 18 inches wide and yields fine assaye. The second, third and Surprise ledges yield good assays. No. 4 lode is a fine body of ore 12 ft in width with well-defined walls. Between the walls are seams of clay, porphyry and quartz, the quartz assaying from $90 to $1,200 per ton. A drift has been started and run 40 ft on the footwall of this ledge to connect with the shaft.

GOODSHAW.—The main shaft is down 600 ft. The winze on the 450 level is now down 130 ft, all in good milling ore. The last 100 ft the ledge has continued to improve.

DOUBLE STANDARD.—The west crosscut is now in from the bottom of the winze 65 ft and cut through the ledge, which shows a width of three and one-half ft. This is a very important development. Heretofore the ledge carried gold, but it was very low grade; it now shows an average assay of $45. Have started drifts north and south on this vein.

SUMMIT.—North drift, 530 level, is in 130 ft. The ledge is two ft wide. The south drift, same level, is in 140 ft; progress for the week, 17 ft. The ledge is two and one-half ft wide, and looks well. The upraise from the south drift to connect with the Standard is up 28 ft; progress for the week, 18 ft. The ledge is about two and one-half ft wide and looks well.

STANDARD.—*Free Press*, Mar. 14: The main shaft is down 312 ft. The north drift from the east crosscut, 300 level, is in 90 ft. The ledge in the face is three ft wide, of free milling ore. The south drift, 385 level, is in 394 ft; the ledge is two and one-half ft wide, and looks well. Have started on east crosscut from this drift to connect with the north drift in the West Standard mine. The upraise in this drift is up 75 ft; the ledge is six ft wide, of very fine ore. Upraise on the Cook ledge is now 68 ft above the 300 level, showing a ledge three ft wide of good ore. Upraise No. 2, north drift, is up 92 ft. The ledge is four ft wide. North drift on east ledge, 300 level, incline, is in 109 ft; ledge two and one-half ft wide, of good ore. The south drift from the west crosscut, 300 level, incline, is in 210 ft. The ledge is five ft wide, of good ore.

BELVIDERE.—The joint south drift is in 100 ft. The ledge is four ft wide, of good ore. The main west crosscut is in 96 ft. The south drift is in 39 ft, with a ledge four ft wide. The north drift from the top of the upraise is extended 23 ft north of the sbaft, showing a four and one-half ft ledge of ore worth $75 to $100 per ton.

UNIVERSITY.—The sbaft is down 400 ft. The rock continues hard.

BULWER CON.—The north drift on the Ralston ledge is in from the tunnel 91 ft. The ledge is three ft wide, and looks well. The south drift is in 92 ft. The ledge in the face is two and one-half ft wide, of good ore. The stopes are looking well.

JUPITER.—On the 500 level the west crosscut from the main south drift is in to-day 137 ft, and the west crosscut from south drift No. 2 is in 85 ft.

yielded thousands of dollars. This covers the Mendota, Spanish Ranch tunnel, Queen Sahe, Deep Hole, Garland's Lava Beds and the Bolyar claims. To the north we have the Summit mining company and Challens & Andrews' prospect in the mountain that fed the old Sharp's Ravine claims, which were famed for their rich pay. Here we have a deposit of gravel extending north through the mountain to the east branch of Feather river; west to the Mountain House No. 2. This deposit is 10 miles in length and 5 in width, and the gravel has fed the Brandy Flat, Spanish Creek, Orub Flat and Chinatown diggings. To the west and south are the Silver Creek diggings, where gravel deposits are the washings from Spanish peak, Burton's gulch, and sundry otber ravines that have paid richly; also the Scad Point claims. In this neighhorhood is the Plumas mine. The rock in the dump pile tells the story, to say nothing of the specimens which they have to put under lock and key. The last are marvelously rich. At Spanish peak extensive operations are in full hlast. The Monte Christo mining company, of Chicago, commenced operations last fall to open up the Spanish Peak blue gravel deposit. Southeast of Spanish Ranch we find the Grizzly Ridge mining company, running a long tunnel, with flattering chances of striking the blue lead. A little east of this are the Hungarian Hill gravel mines.

NEVADA.

NEVADA CITY.—*Transcript*, Mar. 14: Drifts have been run north and south 500 ft on the 150 level, ore taken out and a large quantity ready for stoping. The ledge is from two and one-half to three ft tbick. About 300 tons of ore have been crushed, averaging $30 per ton.

CONSTITUTION.—Situated on Deer creek above the Murchie. The incline is down 100 ft, and a drift is heing run on the ledge, which is from 18 to 24 inches thick. The ore is among the richest ever discovered in this county.

PLUG HAT.—Ore taken from the croppings paid $1,300 a ton in spots. A crushing lately paid $23 a ton in free gold, hesides the sulphurets. There are 50 tons of ore on the dump. The incline is down 50 ft.

PITTSBURG.—This mine, which bas been in operation for many years, and is developed to a depth of about 800 ft, more or less, is heing worked on the tribute plan at present. The last crushing paid $5.25 to the man per day.

GENERAL GRANT.—A new tunnel, 700 ft long, is to he run, tbe cut having already been made. Tbis tunuel will give 150 ft hacks on the ledge, which is 15 inches thick. The ore has averaged $25 a ton, some of it going as high as $30.

FEDERAL LOAN.—The average rock taken out has yielded $25 a ton, some going as high as $50. The incline is down 180 ft.

NEW OPHIR.—This is a recent relocation of the old Allison mine on Selby flat. It is held hy four first-class, practical miners, who have taken out 40 tons of ore tbat is of a bigh grade. They are now erecting an arastra to he run by water power.

MERRIFIELD.—The incline, having reached the 600 level, is now heing sunk 200 ft more. There are three ledges, from three to ten ft thick, in the fissure. The ore is very rich in sulphurets. Fifteen stamps are kept constantly running, and crush about 900 tons of ore per month. The milling capacity will soon he increased to 1,500 tons per month by adding 10 stamps, and four more Frue concentrators—making 10 in all—will he put in. New chlorination works are also to he erected this summer. A new three-compartment incline is being sunk on the hill 1,600 ft north of the present incline, and is already down 300 ft. The elevation of this incline over the lower one is 350 ft perpendicular. A tunnel is heing run from the top of the old incline to connect with the new one at a distance of 700 ft from the mouth. The tunnel is now in 1,400 ft. The machinery at the creek is all run with two overshot wheels during tbe winter. In the dry months, three engines are employed, hesides the one on the hill.

JULIA.—The owners are running a tunnel to tap a strong ledge, which they found, by a shaft, and from which they took some good ore.

MT. AUDURN.—Is on the Newtown road a short distance west of this city. Hoisting works have been started within a few months. The incline is down 250 ft, running part of the distance under the ledge. Drifts were started at the 250 level.

DEADWOOD.—The main incline is down 500 ft on a very flat ledge dipping to the northwest. About $50,000 were produced last year, and four dividends were paid by the company who leased it, hesides $150,000 taken out by former owners. The quartz yields from $20 to $60, and is rich in sulphurets.

PLACER.

JACOBS & SARGENT'S.—Dutch Flat *Forum*, Mar. 11: While sinking the new sbaft 35 tons of ore were taken out which yielded $600 in gold.

PLANET.—About 52 carloads of gravel, taken from the drift, was washed; result, $66 in gold. The gold was fine, which proves that the center of the channel is not reached.

ORIFFITH CON.—*Mountain Democrat*, Mar. 13: A considerable amount of fair-milling ore is on the dump. There is a large amount of bigh-grade ore in this mine. A piece of gold bullion nearly as hig as a $20 piece is the product of 38 pounds of ore. Samples of sulphurets from the tailings yielded over $100 per ton.

PLUMAS.

MINING NOTES.—*National*, Mar. 6: In the neighborhood of Spanish Ranch we have the Plumas mining and water ditch company, with 200 acres of good gravel deposits and 21 miles of water ditches. Said ditches command some of the richest claims in the county, independent of Badger and Gopher hills and the Metcalf claims. These claims are worked with hydraulic water power three giant pipes, under 400 ft pressure. From them for about four miles is a rich deposit of hlue gravel that has

TUOLUMNE.

VALPARAISO.—*Independent*, Mar. 13: Is on Jackson flat. Its product amounts to $100,000.

PETTERSON.—It has been worked, off and on, for nearly 25 years with fair profits.

GILLIS.—Formerly the Carrington; is similar in its formation and character of ore to most other neighboring veins. It is a good paying mine. The proceeds of past years amount to no inconsiderable sum.

ATLAS.—Formerly the Waters. They have a 20-stamp mill; it is the best constructed and most substantial mill ever erected in the county. The shaft is down on the lode 85 ft, with a 100 level and a cross drift 22 ft. Yet at this depth the walls have not been found—all vein matter. The surface showed 18 ft between the walls. The ore differs from any in the county. The vein matter is in alternate layers of, first, pure white quartz, from one to three inches thick; then what much resembles sedimentary deposits of a grayish cast. Both strata are heavily charged with sulphurets which carry a large percentage of gold per ton. Though a low-grade ore it can he made a paying mine if the yield is hut $5 per ton.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Mar. 15: The main incline has a depth of 67 ft, on the slope, below the 2500 station, passing through some quartz. On tbe 2500 level the main north drift is in 250 ft from the incline. The east drift has a total length of 178 ft. On the 2300 level the joiut Mexican east crosscut on the northern boundary is now 166 ft from the main north drift. On the 2200 level the north drift in the Hardy vein has a total length of 148 ft from the main southeast drift. The raiso from the end of the south drift is up 21 ft. On the 2100 level they have started a drift north from the bottom of No. 1 winze. It is now in 21 ft, and shows low-grade ore in the face.

BELCHER.—The wiuze now heing sunk on the 2760 level, 25 ft east of the ore streak, has reached a deptb of 48 ft. On the 3000 level the south drift is now in a distance of 227 ft.

CALIFORNIA.—During tbe past week 216 tons of ore have been extracted. On the 850 level west crosscut No. 2 is now in 60 ft. On the 1500 level the west crosscut has heen extended 25 ft. On the 2200 level, the joint east consolidated crosscut on our southern boundary is in 160 ft. The C. & C. shaft is sunk and timbered 80 ft below tbe 2200 level.

OVERMAN.—During the past week east crosscut No. 2 has heen extended 51 ft through hard vein porphyry. Upraise from 700 level bas heen extended 38 ft through quartz and porphyry. Forman sbaft has heeu sunk and timbered 20 ft; total length, 960 ft.

CAMPBELL DISTRICT.

NUTMEG.—*Silver State*, Mar. 8: They have sunk two shafts, one 70 ft and the other 50 ft deep, the ore from which assays from $40 to $300 per ton, and carries considerable gold and some galena. The ledge is from two to five ft wide.

EUREKA DISTRICT.

EUREKA CON.—*Sentinel*, Mar. 15: The following work has heen done in the several levels: 2d—North drift continued 42 ft; now in 57 ft. 3d—North drift continued 24 ft; now in 193 ft. 7th—North drift continued 47 ft; now in 86 ft. Northeast drift continued 23 ft; now in 200 ft. 8th—Southeast drift continued 26 ft; now in 208 ft. 9th—West drift continued 10 ft; now in 100 ft. 10th—East drift continued 25 ft; now in 215 ft. 11th—North drift continued 21 ft; now in 121 ft.

RUBY CON.—The 500 level has heen connected with the winze, thus ventilating the mine and enahling the crosscut to be commenced in the Home Ticket. Already a small hunch of ore has heen met with. The lode will be intersected 50 fathoms helow where they are now working, and where there is a vein of ore from two to four ft wide, of good quality, and yielding profitable results.

THE STRIKE IN THE DUNDERBERG.—One of the most important events in the history of Eureka district was the striking last week of a hody of pay ore on the 400 level of the Dunderberg mine. The ore found is entirely independent of any ore body ever struck in the vein before, and its being in virgin ground speaks well for Atlas hill, or rather the southern portion of the great mineral helt in which the Richmond and Eureka Con. are found. The ore is 12 ft wide and still making in the face of the drift. It has heen opened upon its course a distance of 15 ft and shows improvement as the drift is advanced. The average assay of the ore is $60 per ton—two-thirds in gold.

WINNEMUCCA DISTRICT.

REFORM.—Reuo *Gazette*, Mar. 8: Has struck something different from any of the rock heretofore found in the country north of Reno. It is a heavy looking metal in a matrix of very handsome quartz. There is evidently a good deal of iron in it, hut the assays also show silver to the amount of $35 to the ton. The discovery increases in importance as it is developed.

ARIZONA.

SURPRISE.—*Silver Belt*, Mar. 6: Shows a 2½-ft vein with a 12-inch pay streak, at the hottom of a 30-ft sbaft. The character of ore is silver glance, of a very high grade. The result of a recent assay gave $1,082.

STONEWALL.—At the hottom of a 65-ft shaft they have an 18-inch vein of ore, assaying up into the thousands.

NORTHERN LIGHT.—This mine is situated two and a half miles from town, and can he traced for over 5,000 ft. The average width of the ledge is 30 ft, and assays from 18% to 25% copper and from $8 to $30 in silver. It is known as the True Blue.

EMELINE.—The Emeline mine continues to pan out well. The ledge is four ft in width, is strong and well defined at 20 ft in depth, carrying a 12-inch pay streak of 400 ounces milling ore.

BUFFALO.—The vein has improved from the surface down and shows seven ft in width at the depth of nearly 100 ft.

SEA.—Has a shaft 35 ft deep, all in rich ore, assaying from $100 to $17,000 per ton.

OLD HAT DISTRICT.—Cor. *Citizen*, Mar. 8: The American Flag sbaft is down 31 ft, and there is on the dump, ore worth $12,000. It contains about equal proportions of gold and silver, and the latest assays from the bottom of the shaft average $264 per ton. On the Pioneer, the new shaft is peing pushed ahead, and will strike the ledge at 75 ft from the croppings. The Good Luck, which is parallel to the American Flag, shows a vein of about four ft, the ore assaying from $60 to $120 per ton. The Jimmy Lee looks very well, the ore running high in both gold and silver, with a large ledge to draw from. The Black Bear has a shaft down 32 ft, with a 3½-ft vein, the ore assays averaging $90. The Bullion, joining the last mentioned mine has a shaft down 15 ft, assays from which average $30 per ton.

VERONA AND COMPROMISE.—The croppings are from 40 to 100 ft in width, and vary from 10 to 20 ft in hight, assaying 20 ounces to the ton. The incline which is down 65 ft, has heen sunk on the footwall. At a deptb of 75 ft a crosscut will be run across the ledge to ascertain its widtb. Some assays from the bottom have ebowed 100 ounces to the ton. All the ore can he easily smelted by the ordinary furnace.

MONITOR.—Tombstone *Nugget*, Mar. 4: On the entire

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The Debris Question.

Col. Mendell's Report to the Chief of Engineers.

Lieut. Col. Mendell, of the Board of U. S. Engineers for the Pacific coast, has made the following highly interesting report on the debris question to the department at Washington:

SAN FRANCISCO, February 20, 1880.

The Chief of Engineers, Washington, D. C.—GENERAL: Various annual reports on the improvement of the Sacramento river of this State, beginning in 1876, have made mention in a general way of the relation of hydraulic mining to the navigation of the Sacramento.

Filling in of Steamboat Slough.

The last annual report included a comparative profile of the bed of Steamboat slough (one of the principal channels of the Sacramento), as plotted from Wilkes's survey of 1871, and the survey of 1878. This showed a maximum filling of 22 and a mean filling of 8 to 10 feet. This comparison is not owing to the uncertainty as to the base of levels of the exploring expedition insisted upon except to demontrate the fact of a serious filling.

What Has Happened at Sacramento.

The same report showed as a result of the survey of 1878, that the plane of low water at the city of Sacramento has been raised about 5 feet since the occupation of California by Americans. The tide, which 30 years ago produced an elevation of about two feet at Sacramento, and made itself felt as high as the mouth of the Feather, now does not sensibly extend above Heacock shoal, 9 miles below Sacramento.

A survey of the river in front of the city of Sacramento for a distance of two miles, in 1854, by authority of the Town Council, shows in comparison with our survey of 1878 a mean filling over this distance of 15.2 feet and a maximum filling of 25 feet. This comparison was made by the State Engineer.

The State Engineer finds the filling of the river at the mouth of the Feather to be 3 to 4 feet; at Marysville on the Feather to he 13 to 15 feet; at the Yuba mill, on the Yuba river near where it emerges from the foothills in a part of the stream that never was navigable, 68 feet; and at Smartsville, still further in the foothills, at the outfall of some larger mines, the filling is reported to be 125 feet. The pools in the Feather have also been very much filled. The tendency of the river under the great loads of material imposed upon it is to take a grade which tends constantly to get steeper.

Steamboat slough, which was formerly the shortest and deepest of the two arms of the Sacramento, is reported, on good authority, to have been filled a good deal since the survey of 1878—so much so that it has been abandoned as the usual route of river boats.

Navigation of the Lower Sacramento.

The navigable condition of the lower river has also suffered very much, owing to the same cause, but not in proportion to the actual filling. The mean depth has been lessened in a much greater proportion than has the maximum depth.

The filling in the beds of the Sacramento and Feather rivers is mainly sand. Many borings in the Sacramento were made in 1878, almost always with the exposure of sand. At the mouth of the river and in some bays where the current is feeble there is a deposit of sediment or "slickens," as it is locally called. This is a mixture in a fine state of division of clay and extremely fine sand. It is suspended with such facility that it may almost be called soluble. It gives the yellow or tawny color to the waters of the running rivers and imparts to the waters of San Francisco bay a feebler, although a distinct shade of color. The "slickens" do not appear to rest in the main river. When they reach the channel they are carried by its current to resting places in the lower bays, and perhaps, in part, in the ocean.

The other products of hydraulic mining are sand, both silicious and micaceous, gravel of all sizes to stones, which may appropriately be called cobblestones, as they reach the foothills. As they leave the mining sluices they are, in many cases, much larger.

I enclose a map of the lower Sacramento and its tributaries (Appendix A), covering the parts of the mining districts now under consideration. The names on the map in the mining districts are those of prominent mining points. The Feather and American rivers drain the greater part of these districts. The Yuba, which joins the Feather at the site of the town of Marysville, is also an important mining stream. Upon these last two streams the consequences of the state of affairs that has existed in this country for a great many years have been more fully developed than elsewhere. In order to exhibit these results in an effective way, I enclose maps of the Yuba and Bear rivers for a few miles of their course. These maps are obtained through the courtesy of the State Engineer department—(Appendix B and C).

Deposits of Mining Detritus.

A few words may be said in explanation of the Yuba map. The shading denotes the deposits of mining detritus. This deposit opens out as the river is released from confinement in the foothills. It attains a width of 6,400 feet, and is estimated that it has thus far covered 14,600 acres in the plains, much of which was alluvial land of value.

The crop section on the Yuba map shows the elevation of this mass of detritus to be here above the general level of the country. This general level is the second bench of the bank, the first being covered. The original bed of the stream is said to have been 10 or 12 feet below the lower bench.

The same general descriptions may be given of the deposits on the Bear river.

These rivers, after reaching the plains, no longer flow on natural channels, but make for themselves beds which change from year to year, and which are in many places above the adjoining farming lands. These lands are protected from the flood water and from the mining deposits by levees, which, year by year, have to be built higher and higher to keep up with the new deposits which are yearly added. When the levees give way, which is not an unfrequent occurrence, the lands adjoining are covered with a deposit. In places where the flood water stands quite long enough, a thick crust of slickens forms on the land. The thickness runs from a film to perhaps a foot. The sand and gravel are generally deposited close to the site of the breach.

The losses that the farmers suffer yearly from this cause, and the apprehension of future disaster of still greater magnitude, have given rise to a good deal of contest in the courts and legislatures. It now exists in the Legislature of California when the great questions of agriculture and mining are engaged in controversy. There is much to be said on each side of the contest.

Hydraulic Mining.

The great source of the evils that have been briefly sketched is admitted to be mining. The main existing cause is hydraulic miuing. Quartz mining and other mining than hydraulic have their influence; but their sources are relatively so insignificant that they may be neglected in comparison with hydraulic mining.

Hydraulic mining makes a profit out of gravel or earth which contains six or eight cents in gold to the cubic yard. It does so by making water do the work that in other mining is done by machinery or hy manual labor. Water excavates the mountains and carries the detritus to the dumps out of the way. Water also brings this detritus from the dumps, which are generally iu gorges of the mountains, to the plains, the river beds or ocean beds, wherever it comes to rest.

When the water is made to excavate it is used under a pressure of 100 to 300 feet, and is discharged against the bank from a nozzle that may be 5 inches in diameter, and in some cases is 9 inches. This same water conducted in sluices of 4 to 6 feet wide, on a grade of 200 to 300 feet to the mile, carries the excavated detritus to the outfall or dump. New material accumulates at the dumps until the freshet in the channel carries it below. The streams at the upper mines have a fall of 70, and perhaps 100 feet to the mile. A freshet with such a fall makes rapid destruction of a dump.

Capital Invested in Mining.

This rapid and cheap handling of earth or gravel is made possible only by large investments of capital. These investments are made to bring water from higher altitudes, so that it can be used under the necessary pressure. The water is brought in ditches 40 miles, more or less, long, built in a country which, for vertical dimensions and steep slopes, is almost unequaled. These canals are bold in the extreme. Inasmuch as the streams do not furnish sufficient water at all seasons, it becomes necessary for the miner to store water from the melting snows, which he does in large reservoirs, which are also admirable specimens of their kind. These reservoirs are well up towards the summit of the Sierra Nevada. Several are shown on the map, as the Fordyce, the Bowman, the English and the Meadow Lake.

The construction of the canals, reservoirs and sluices from the mines to the dump, which is often through a tunnel some thousand feet in length, are all preliminary to the actual operations of mining. These constructions have, in some cases, required several years time, and in the case of the North Bloomfield, required the expenditure of about two millions of money. In these circumstances lies one of the main appeals of the miners. In many cases the principal has not been returned, and cannot be returned unless the system is allowed to continue.

Responsibility for Accumulation of Debris.

Although the hydraulic miner is now unquestionably responsible for the continual accretions that raise the levels of the beds of the water courses year by year, yet the history of these deposits show that he is not responsible for all that is past. Hydraulic mining, in the effective form it now presents, is of quite modern growth. The earlier mining done from 1848 to 1860 was done by manual labor. Water was used to work out the gold, but was not used to excavate to any great extent. The water was not used under pressure. During these years, and especially during the first five or six years, counting from 1848, many thousands of men were employed in placer mining all through the gold districts. During all these years there was no great flood. The winter of 1861-62 was the occasion of the severest flood California has known since 1848. This flood found all the little gulches and the beds of larger streams stored with the material resulting from 10 years' mining. This freshet brought the sand and gravel down in immense quantities. Whatever filling of the channel may have taken place previous to this time, it appears to have escaped notice. The winter of 1865, which gave high water, increased the evil. The placer mining had been nearly, if not entirely, exhausted by this time. Each successive flood has made things worse and worse.

It has been said that a profit can be made out of earth that contains a few cents of gold to a cubic yard, but in order to accomplish this a large investment of capital must be made in procuring a sufficient supply of water under an adequate pressure.

It will now be understood that in order to return a good interest on large investments larger quantities of earth must be handled.

What Water is Required to Do—Quantity Used.

The quantity of water that a mine uses is generally pretty well known, at least approximately. The quantity of earth that is moved has not generally been a subject of interest to the miners, and for that reason our information on this subject is not as full as is to be desired. In a few cases the amount of excavation has been measured and some attempts have been made to obtain general results as to the amount of excavation that can be made with a given quantity of water. This amount varies with the character of the material, with the slope of the hill and with the pressure of the water. It is not here proposed to go into detail on this point, but it seems desirable to convey some sort of an adequate idea of the results of this kind of excavation.

An inch of water running for 24 hours is taken to be 2,230 cubic feet. On the San Juan ridge, between the South and Middle Yuba, the State Engineer reports that in the year beginning November, 1878, 2,819,317 inches of water were used, while the quantity ascertained to have been used during the same time in the drainage basin of the Yuba is 5,893,962 inches.

An inch of water will excavate at all rates from 1 to 7 or 8 cubic yards of earth. The Spring Valley mines at Cherokee have been excavated to the extent of 23,000,000 cubic yards in seven years, with an average quantity of 2,250 inches. Allowing 310 days to the year, the daily excavation for an inch of water is about four yards. The material here is very light, mostly sand, fine gravel and clay in cliffs 400 feet high. The grades of the sluice is perhaps an average, being 1 foot in 24.

Quantity of Earth Deposited in the Streams by the Mines.

It would, perhaps, be an excessive allowance to apply this rate of excavation to the Yubas. It is, however, within the probable limits of truth to place the amount of material excavated in the basin of the Yuba at 2½ yards to the inch. This allowance makes the yearly amount placed in the stream and its tributaries at 14,000,000 or 15,000,000 cubic yards. On the other mining streams, the Feather, Bear and American, there is no reliable information as to the amount excavated and deposited in the streams.

The attempt has been made to estimate the quantity of material in the Yuba and Bear rivers that have not yet reached the navigation lines, but which lies in the path of the floods, and is, therefore, liable to be washed farther and farther, in greater or less degree, by every freshet. These deposits are the result of past mining. If no more were added, they are yet capable of doing a great injury to the water courses below.

The amount lying in the bed of the main Yuba and its branches, above the Yuba mill, is 49,263,200 cubic yards. The amount below the Yuba mill as far as Marysville, 14,600 acres covered, average depth assumed to be 4 feet, is 94,288,664. Total, 143,551,864.

On the Bear river the estimate is 148,248,000, of which 62,088,000 lies in the plains, and 86,160,000 cubic yards are in the bed of the stream above the foothills. This estimate makes the total amount in the two streams to be 291,799,864 cubic yards. It is not pretended that this estimate is accurate. It could not be so without boring the deposits in thousands of places. It is made from the best information available. Its use, in its imperfect accuracy, is to convey to those who have not the opportunity of seeing it some conception of the enormous dimensions of the phenomenon.

The character of this deposit has already been defined. It is sand, gravel, slickens and stones. The part that has reached the plains to this time is sand, gravel and slickens. The layer of gravel and cobbles remain, as yet, in the foothills. There is some coarse gravel in the Yuba, four or five miles below the Yuba mills.

The Yuba having been filled 125 feet at Smartsville, and perhaps 15 feet at Marysville, the slope of the river between these points, a distance of 18 miles, has been increased 110 feet, which is about six feet per mile. This about doubles the original slope.

The tendency to increase the slope of this part of the river brings the gravel lower and lower. This is counteracted, to some extent, by the great breadth of the stream in the plains at high water. Small gravel is, however, found now in small quantities within three or four miles of Marysville. With the increase of slope under the influence of freshets we must expect this gravel to reach first the Feather, and in due time the Sacramento. Once in either of these streams in considerable quantities, it cannot be expected to move under the influence of the current, or if it did, the effect would be to transfer it to a more objectionable place. In the Feather the pools that formerly alternated with ripples have been filled. It is estimated by the State Engineer Department that there is a deposit in the Feather of 40,000,000 cubic yards, and in the Sacramento below the mouth of the Feather something like 100,000,000 cubic yards.

Future Mining.

The quantity of material that remains to be excavated at the mines by hydraulic process cannot be stated with any particular degree of accuracy. This quantity is, however, known to be very large. The quantity remaining in the San Juan ridge between the South and Middle Yuba was estimated by James D. Hague in 1876 to be 700,000,000 cubic yards. The following quotation from a printed report made by this gentleman illustrates this statement:

"The linear extent of the gravel channel and its branches in this ridge is about 25 miles. Deducting liberally for the portion already worked, and for that too deeply covered by lava, to be available for hydraulic mining, there remain probably not less than 14 miles of channel available for working, from which only a comparatively small portion of the top gravel has been removed. Below San Juan the gravel body has a surface width of over 1,000 feet and is, say, 140 feet deep. From Badger Hill to Bloomfield it is for the greater portion very much wider and deeper. At Columbia Hill its surface width varies from 3,000 or 4,000 to 8,000 feet, and is from 300 to 600 feet deep. The gravel at Lake City is probably 300 or 400 feet deep. At North Bloomfield it is opened to the bedrock, showing a depth of more than 300 feet. Roughly estimating the average width of the remaining gravel range at 400 yards, and after allowing for the portion worked off, placing its average depth at 70 yards, the sum is an average of 50,000,000 yards per mile, or for 14 miles, say, 700,000,000 yards. There are, so far as is known, no means of estimating the contents of other gravel deposits in the drainage basin of the Sacramento, nor is it necessary for the purposes of this report that this amount be now known. What is fairly known is sufficient to justify a conclusion."

The preceding description enables us to forecast with certainty, in every respect but time, the disasters which impend over the valleys and their water courses. The great gravel deposits on the flanks of the Sierra Nevada occupy the channels of an ancient drainage system, which was obliterated by an enormous movement of gravel and boulders brought from higher regions, perhaps, by glacial action. New drainage lines were in time excavated by erosion, and these, in turn, are now undergoing a process of obliteration which, if less magnificent in the scale of movement of material than the ancient natural action, is no less certain of its results.

It is hardly necessary here to say anything as to the probable alignment of the third and last drainage system which will replace that which now exists. It is sufficient to appreciate that the result, be what it may, will bring disaster to a large portion of the State.

Storage of Mining Detritus.

It is then of the first importance to know what can be done to remedy or mitigate these evils that have been described. This description has been directed mainly toward showing the injuries to which the rivers are exposed. There are other features that are only secondary in importance. The elevation of the bed raises the flood line and gives to an ordinary freshet the terrors of a flood.

The riparian strips of country are constantly threatened with overflow, and all the country which depends on the rivers for communication finds the efficiency of navigation impaired.

Relief from the certain increase of evil that must result from a continuance of the present system of mining can be given only by a restraint of the mining detritus by storing in places where it can do little harm. This mass of material must be stored in reservoirs, the best place for which is in the foothills of the Sierra Nevada. The reservoir must be made by placing dams across the beds of the streams into which the material is discharged from the mines.

Material for Dam Construction.

Well up in the foothills there is an abundance of stone. This is the material of which to make the dams, which will be a mass of rip rap, the pieces being of sufficient weight not to be moved by the freshets. The dam will therefore not be water-tight, and being composed of stones without bond, we are enabled to found it on the gravel without the necessity of going to bedrock below. It is, therefore, an obstruction rather than a dam. The slopes of the mass will depend upon the size of the material. With large stones of several tons weight the lower slope may be one base. The only disaster that can come to such structure is settlement. If it should be undermined at the foot of the slopes, it will settle, and can be restored by the addition of stone. The construction is inexpensive, involving no skilled labor.

Now suppose such an obstruction placed across the bed of the Yuba, the storage capacity will depend upon the slope the material takes under the action of the freshets. The slope of the detritus now in the bed at this point, as it was left by last winter's freshet, is about 22 feet to the mile. If we assume this as the slope when the reservoir is full, the estimate of the storage, based upon the surveys of the State Engineers, show that a hight of one or more obstruction, making a total of 50 feet, placed just above Deer creek would hold back about thirty million cubic yards. Taking the slope of ten feet to the mile, the same obstruction would hold back seven and a half million yards.

If you suppose the material mined on the Yuba to be stored, it would not be two years before the larger capacity here mentioned would be exhausted.

It cannot be expected, however, that all the

detritus will be stored. The slickens and soms proportion of the sand will escape. What that proportion may be experience must determine. We can safely say that a very large proportion will be retained, and that in this respect, the condition will be improved.

When the necessity for more storage approaches, let us suppose another dam built of suitable hight placed further up the stream, and so on in succession as may prove to be necessary. The width of the bed of the Yuba at the dam site is 300 feet. There ie a depoeit in the bed of 30 feet of sand, gravel and stoues. The side slopes of the mountaius rise to a hight of perhaps 1,500 feet, and have an inclinatiou of 35° to the horizon.

Tha base of the first dam is 300 feet. Fifty feet higher the width of the valley will be 440 feet, and each succeeding hight of 50 fset would widen ths stream 140 feet. The hight that it may be prudent to give to these dams depends so much on the material and circumetances in each case that it must be left for future cousideration.

The following table gives the storage capacity for different hights on the assumption that the material takes a slope of 10 feet to the mile. The quantities in thie table are used as a basie for an approximate estimate.

Table showing the quantities of material in dams, and quautity thet can be impounded at different hights, the present width of hed being assumed at 300 feet and side slopes of 35°:

No. of Dam.	Hight—Feet.	Total Hight—Feet.	Stone in Dam—Cubic Yards.	Storage Capacity—Cubic Yards	Total Storage.
One	50	50	32,000	7,537,000	7,537,000
Two	25	75	30,777	12,164,000	19,701,000
Three	25	100	35,240	16,150,000	35,851,000
Four	25	125	39,212	22,740,000	58,591,000
Five	25	150	43,783	25,408,000	83,999,000
Six	25	175	48,255	27,908,000	111,907,000
Seven	25	200	52,726	30,550,000	142,517,000
Eight	25	225	57,197	33,150,000	175,667,000
Nine	25	250	61,670	35,738,000	211,405,000
		300		79,258,000	290,663,000
		400		189,628,000	480,289,000
		500		231,106,000	711,395,000

In this calculation no allowance is made for the increaso of reservoir by tributary streame, nor for extension up stream above the original length aesumed, namely, 40,000 feet. If, then, the dimeneions turn out to be as here assumed, tho storage in the table is much too emall. The dimensions aeeumed are an average given by the State Enginoer Department.

The economy and comparative stability of low dams are plain. Two 25-feot dams require about two-thirds the quantity of stone of one 50-foot dam, giving the same storage capacity.

The contents of the dam are calculated solid, without allowance for voids, and to each volume 20% ie added for paving below the dam. In the first three dame, taken ae a whole, one cubic yard of stone impounds 242 cubic yards of detritue. For the other dams, one cubic yard of stone impounds about 580 yards.

There is some difficulty in estimating the probable cost of these dams. Good authority places the cost at about $1 per yard. The material ie known, for some dame at least, to be convenient in the hills above. It is proposed in the absence of full information to adopt higher rates, which are assumed as follows:

Average for first three dams, $1.50 per yard; for remaining dams, $2.50 per yard. With these rates the cost of the first three dams will be $222,025, storing 35,700,000 cubic yards, being about three-fifthe of a cent per cubic yard stored. For the upper dams, the bed of the stream having taken the slope of 10 feet to the mile, the expense becomes reduced, per cnbic yard stored, to less than one-half a cent.

The above is as fair a statement of the probable cost of this syetem as can he predicted from our preeent information in regard to the Yuba. This river ie the principal seat of this kind of mining, and it has received the moet attention.

We are not prepared to go into the same kind of calculation as to the American or the Bear. There may be some objections in the latter streams to this storage, for the reason that it may interfere with the outfall of the mines. The cost will probably be less in these mines for the reason that the amount of mining is less than on the Yuba.

Alternatives Presented.

This system of etorage, the cessation of hydraulic mining, and the destruction of the navigable rivers of the interior are the alternatives which present themselves for consideration. It is true that the last alternative is not without qualification, as will be seen further on, when the diversion of some of the tributaries of the Sacramento is considered. It is to he remarked that this diversion is in itself destructive to our navigable line, and that it does not afford relief to the city of Marysville, and to the farming lands adjoining the mining rivers, which are now so seriously threatened.

How the Dams may be Made.

The purpose of these dams is novel. The mining dumps, however, in the rivere where the material is large, as at Smartsville, play the same part and store material above them. The eecurity of these dams depends upon the stability of the laver elope. The stones on these slopes must be so large as to hold their places under the floods which pass over them, and the positione they are made to take muet be of studied irregularity so as to destroy velocity hy falls.

Ths first dam of ths seriee in ths most important, and will require ths most particular care in its conetructiou.

Ths cost of these dams, it must be admitted, cannot at present be closely forecast. The prices that have been assumed are much in advance of those that are given by good authority in such matters. It remains for experience to indicats what this cost will be. If we doubls the estimates that have beeu made the per cubic yard etored will yet be moderate.

The mines about Smartsville aro among the best. There are also mines at Timbuctoo and Sierra Flat on the Yuba. All these miues are below the eitee of the dams at Deer creek. We must storo the detritus of these miues lower down. Going down to the edge of the foothills, ws find a place which is about 6,000 feet wide from high laud on one side to high laud on the other side. This is a very good eite for a dam, which will have to be made of brush. The material is convenieut in the slope of the thick growth of willowe which epring up on the mining deposits. The storage area belcw the Smartsville dumps is ahout 2,700 acres, which covered to a depth of 10 feet will give a reeervoir capacity of 43,500,000 cubic yards. This reservoir will help to restrain the sand which may escape from the upper storage.

The long crest of this dam will make a safe overfall; a large part of the dam material will be constantly wet and therefore durable. It will, however, require repairs from time to time.

The detritus that lies in the plains below the foothills can hardly be raised higher than it uow is without danger and certainly alarm to the farmers where lande adjoin. By directing the course of the Yuba river through the plains, it is believed that it can be made to create and maintain a bed, provided new accretions of eand are preveuted. The treatment will require the transfer of a relatively emall quantity of the detritus to the drainage channels below.

Treatment of Bear and American Rivers.

The Bear river requires almost ideutical treatment with the Yuba. It ought to have a dam at some point in the mountaius. This river has not bsen examined with the eame care as the Yuba, aud therefore an estimate cannot be made with the same defiuiteness. A second dam ought to be built at the edge of the plains near Camp Far West.

The same treatment is required for the Americau river.

When the Dam Should be Built.

If this description of the existing state of affaire ie at all adequate, it will not be doubted that the necessity for these works is urgent. It is etrongly recommended that these dams be built during the coming summer. The proper time is during low water, which extends from August to October. During this period there is little water in these rivers, except that which comee from the ravines, and consequently there will be little difficulty, due to the presence of a strong current.

At the dam eite in the Yuba, near the mouth of Deer creek, the rise of high water is stated to be 11 or 12 feet. The freshets are generally of short duration in the winter, the greater part of the precipitation being in the form of enow. A eecond high stage lasts through May and June, during which time the snow is melting. This latter stage is believed to be not so high as the winter freshets, although much longer.

The storage of mining detritus in the mountaine being successfully disposed of, the future will probably he relieved from the immense accretions of sand that now escapes yearly from the mines. Thie ie an immenee advantage. But it remains to point out another resource that is open for the further protection of the Sacramento river. The full investigation of thie plan as to its cost and probability of proportionate benefit, will have to be left for a future occasion.

Raising the East Bank of the Sacramento River.

It may be noticed on the map of this region, that the Sacramento is bordered by lowlande represented by shaded lines. One of these low districte liee hetween the Feather and American rivers, on the east side of the Sacramento. Some parts of this land are repreeented to lie as much as 20 feet below the banks. The average depth hae been estimated at 12 feet. The area is eaid to be in the neighborhood of 60 square miles. Admitting these etatements to be exact, the storage capacity of this basin, filled to the banks, will be about 7,000,000 cubic ynrds.

It is believed to be practicable to turn the Feather and American rivers into this basin, and make them deposit therein the eands which they bring down. No objection is now seen to turning the American in this way. It is not navigable. The diversion could not fail to be beneficial to the Sacramento.

The Feather differs from the Sacramento in being a larger stream and consequently likely to be more expensive to divert and also in being navigable. It is now the outlet for a certain uistrict of country and maintains a small commerce.

It is recommended that a full investigation of tbis problem be made as soon as possible for future guidance.

Remedial Measures Indispensable.

The foregoing is an outline of tbe remedial measures that are possible. It is scarcely necesary to add, in view of what has been said, that eome measures are indispensable. The only alternative ie a cessation of hydraulic mining. Even if thie alternative were adopted it would still hc neccssary to restrain the many millione of cubic yards of detritus already mined, and now lying in the path of freshets which urgs it, year by year, into the lower line of drainage.

It is in a large part due to the courtesy of ths Stato Engineer of California, who has givsn access to data as yet nnpublished, that it has been peeeible to make thie report witb auy amount of definiteness, sither as to ths magnitude of the evil, or the cost and probability of success of remedial efforts.

The general features of this phenoiuenon of choked rivers havs been known for some tims, but no attsmpt has bsfore been made to assign a meaeure to these features. It must be regarded ae most unfortunats that thess msasures had not been taken ycare ago. Some definite conception of tho circumstances would then have been poseible, and ths evil could have beeu grappled with in good tims. The problem becomes more serioue by delay.

The statement of the case which has been giveu faile of ite object if it does not convey a most serious view of the urgency of the question. It is respectfully euggested that this question be brenght to the attention of Congrees as soon as practicable.

Reasens have been given why a full estimate of cost cannot now be made. A great part of the data has come from investigation outside of thie office. Our information must be admitted to be incomplete, but it is sufficient to justify a recommendation for an appropriation by Congress.

Appropriation Recommended.

It is, thereforo, respectfully recommended that an appropriation of $250,000 be asked of Congress, to be expended during the present year in the construction of storage reeervoire for mining detritus on the tributaries of the Sacramento river, and in a further study of this question. I am, very reepectfully, your obedient servant,

G. H. MENDELL,
Lieutenant-Colonel of Engineers.

Useful Information.

REPEATING MATCHES.—A patent has been taken out for a repeating match—that ie, a match that may be etruck a great many timee and yield a light each time. The match consists of two rods of inflammable composition placed side by side in two compartments with a suitable case. In order to etrike the light a ecraper is moved by hand along a platform across the open ends of the two rods. The scraper removes a certain quantity of its substance from each rod, and mixing these together the light is produced. One stick is composed of three parts chlorate of potash and one part of clay, thoroughly mixed, and formed into a thick paste by the addition of water, then dried. The other etick is made of three parts amorphous phosphorus and one part of clay prepared in the same mauner.

A NOVEL ELECTRIC LAMP.—An ingenious device, says the *Electrician*, has been invented for the use of smokers. It is an apparatus to obtain a light. It consiste of a small battery with a ehort piece of platinum in the circuit. Opposite the platinum is a nozzle from which a jet of gaseous benzoline is thrown. Between the nozzle and metal is a small cotton wick. On pressing a trigger the jet of benzeline is turned on, a "ehutter" in front of the platinum is opened, and the battery contact made. The metal becomes incandescent, the jet catches fire and inflames the wick, which continues to burn with a small flame until hlown out. Of course the wick is in a reservoir of oil like that of any other lamp. Cigars lighted by electricity will doubtless be a daily delight to the lovere of the fragrant weed.

COATING IRON WITH IRIDESCENT COPPER.—A writer in the Loudon *Mining Journal* thinks the invention of Dr. Weil, of Paris, for coating iron and eteel with copper or nickel in such a manner that the surfaces shall be iridescent, opene a large field for the employment of metal for decorative purposes. The ornamental iron castings made hoth in Great Britain and France are really beautiful in form and design, and hy the judicious coloration of them with comhinatione of iridescent brass and scarlet, brass and blue, or brass and green, would produce effects which would insure their general adoption.

A REMARKABLE ACCIDENT.—A remarkable accident occurred at the Vulcan Iron Works, Wilkesbarre, Penn. A couple of workmen were striking a har of hot steel with eledges, when a scale was thrown off, about as large as a three-cent piece, but not thicker than letter papsr. This scale struck the arm of one of the workmen just below the elbow, passed through the arm and came out above the elbow on the opposite side. It made a frightful wound. An artery was severed and the blood spurted in jets until pressure was applied to the artery above the place. A physician soon arrived and dressed the wound.

TO MAKE VULCANIZED RUBBER POROUS.—To give porosity to vulcanized rubber, a German process involves the additiou to the material, simultaneously with the sulphur, of 10% or more of wood cellulose; thc other properties remaining the eame.

A STEAM-TIGHT and water-tight cement for joints is eimply white lead and red lead in equal parts, mixed with linseed oil to the consistency required. The leade should be pure.

TO SILVER IVORY.—It is recommended to immerse it in a weak solution of chloride of silvsr (iu cyanide of potassium or hypo?), whsre it is to remain until it has acquired a deep yellow color. It is then removsd, dipped in water and exposed to sunlight until it has blackensd. By rubbing the blackensd surfacs it will acquira a silvery burnish.

Good Health.

Cause and Cure of Sea-sickness.

Much has been said and writtsn in rsgard to the cause and cure of esa-sickness; but as yet no very acesptahle theory has bsen given for the ons, ner any spscific for ths other. Dr. Henry Naylor, of Edinburg, Scotland, holds that it is ceused by a cerebral anæmia, which means a deficiency of blood circulation in the brain. He says:

"The rapid ewinging of the vessel, and tha body with it, irritates the eyes and vision, and thie, by reflex action, producee a spasm of tha cerebral capillarics; this explaine the feeling of faintness and giddiness that comes on suddenly just as the vessel givee a big swing. The sudden emptying of the cerebral vessels causes tha etomach to sympathize, resulting in efforts of vomiting, whether the etomach be full or empty. These symptoms are moet distressing when the eubject is in n etanding or sitting position, with the eyee opsn. If he lies down, the change of position relieves the anæmia, the faintnese and giddiness pass off, and the sickness ceases. But occasionally even a recumbent positiou does not give relief, if the eyes are kept open. When they are shut, the symptome are not felt in the least. I have known this to be the case with several ladies, who were never comfortable while at sea unless they wero lying down with their eyes closed. They were able to eat meals and retain them, if they laid down and closed their eyee immediately afterwards. In fact, I have been obliged to keep eome conetantly in bed to prevent their dying of starvation.

"A fact that helps to show tbe feasibility of the anæmic theory, is that brandy and other stimulants give considerable relief for a time, which would not be the case if cerebral congestion had to do with sea-eickness. The explanation of how sea-sickness continues so persistently in some, is that the sickness weakens the heart's action, and this keeps up the cerebral anæmia, and that in turn again produces the eickness; so that prolonged eea-sickness is due to a circuit of causes, the one producing the other—the visional irritation, cerebral anæmia, eickness, weak heart'e action."

Amyl nitrate uenally doee good in sea-sickneee, used at once, because, being an anti-spasmodic, it relievee the spasm of the cerebral vessels, and thus the brain is refilled with blood, but if it fails, then the persistent sickness, by ite effect on the contractions of the heart, prevents the hrain from getting a sufficient supply of blood, and thue the brain becomes anæmic, not from a spasm of the capillaries, but from an insufficient power of the heart. In thie case alcoholic stimulants in small doses, frequently repeated, are better.

Recreation.

The literal meaning of this word is to make over again; but in ite ordinary acceptation it is intended to convey the idea of rest, refreehment or rather, renovation. The body is refreshed by rest; the hrain is renovated by sleep, hy absolute repose. But both body and brain may be invigorated for a eeason, by changing the direction of their respective activities; and also by working alternately. A man who has hecome tired of riding on horseback or in a carriage, rests himself, gets rid of his fatigue, by walking. The brain which has become weary in thinking of one subject is refreehed hy taking up some other study. On the other hand, a man who feels tired all over, hy work, or a long walk, will "get rested" sooner by eitting down to read than if he did nothing. Rachel, the great tragic actress, when returning from one of her performances at two or three o'clock in the morning, rested herself hy spending an hour or two in changing the furniture of her rooms. The best sedative which a public epeaker can take after a great effort, is to read a newspaper, or anything else which has a variety of short statements.

The great practical idea we wish to convey is, that recreation is not idleness, hut a change of direction in the operation of the physical or mental forces. A French actress lately went mad within an hour after the play, because she went home, laid down and let the mind run on in the same track. She sbould have changed to bodily activity, like Rachel.—*Hall's Journal of Health.*

FRESH AIR.—Live out of doore ae much as you can. It is the place for a man to be. It is good for the health. A dietinguished physician was in the habit of eaying: "However bad the air may be out of doore, it ie always worse in the house." It is good for the temper. People who are always shut up in a house are apt to grow fretful and peevish. They are prone to acquire narrow views of things, and to worry over triale not worth considering. It ie good for the wbole character—for strength, hope, patience and fortitude. It expande and softens one'e nature and makee us more charitable.

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The Week.

The northers which have prevailed for some time past, and by their arid influence were evaporating the moisture from the soil, have given place to a much needed rain, which has fallen just in time to be of especial benefit to the growing crops. It has rendered certain a prolific harvest, and hae given a healthier tone to business operations. The more cheerful feeling in mining circles arising from the expectations of a better time being near at hand, has also added to the buoyancy of the general public, and has aided largely to a restoration of confidence in financial quartere.

The hydraulic minere are beginning to grumble a little at the lateness of the spring freshets. Their harvest time commences when the water begins to "boom," and they are naturally anxioue for the spring to fairly open.

As will be noticed by the remarke in another column, it looks as if an era of strikee wae about being inaugurated in parts of the Eastern States, several having already been etarted. We notice that the *Coal Trade Journal* expect trouble in this direction from the coal miners.

If there has been any change at all in the business prospects in our immediate neighborhood, it has been for the better. Business has been for a long time extremely dull, and confidence is restored with difficnlty. With the great and boundless resources of a State so rich in material wealth as California, this etate of affaire cannot last much longer, and before many weeke are past we hope to eee plain evidences of a reaction.

J. M. LEARNED, of San Joaquin county, has sold his famous mare "Magdallah" to Charles Crocker. It is reported that the price paid wae $6,000.

THE Treaeurer of the Reading (Mass.) Savings Bank has been convicted upon 29 counts for embezzlement.

The Mining Laws.

Among the first eight sections of the mining bill before Congress, it is provided,

1. That the size of the claim shall be 1,500x600 feet.

2. That the locator shall not follow the dip of his ledge bsyond the point whsrs it is intersected by the surface boundary down vertically.

3. The locator shall be allowed one year after making ths location to discover minerals.

4. The locator within 90 days after making his location, must have his claim surveyed by a U. S. Deputy Surveyor, and a plan of the same must be filed with the Surveyor-Gsneral of the State or Territory.

We doubt vsry much whether the first and second sections will be approved by msn at all familiar with mining matters. The provisions will, if adopted, do more harm in one direction than good in another. The ostensible object is the prevention of litigation and conflict, but it may also prevent prospecting and dsvelopment.

This square location idea may do for such sections as Leadville, Colorado, and similar places where the ore lies in dsposits, and would no doubt work better there than the law now in force. In California, Nevada, Idaho, Montana, New Mexico, and Arizona, no such system of locations would answsr at all. The application is only local, and it would work harm except where deposits are the rule, and fissure veins the exception.

What company, for instance, will pnt up expensivs hoisting works, and other machinery to develop a mine, when the ledge pitches so much that it will run into some one elss's gronnd in 800 or 1,000 feet. In soms cases the ledge might run out of the company's location before the water level would be reached, where the ledge is expected to prove its worth. Such a law would bs fatal in any locality where thers was such a lods, as the Comstock, and there would be more litigation than thers is now. When the side lines were reached the company would have to stop, and ths labor all lost if no ors had been struck above, no matter what the prospects were ahead.

It is all nonsense to make a law applicable to Leadville alone, and the whole country. Even in Colorado this fact is recognized. A miners' indignation meeting, held at Salina last week, adopted resolutione expressive of satisfaction with the existing laws and condemning any change. They call the mining bill a "monstrous outrage." One of the resolutions reads as follows: "That said Land Commission, by recommending that claims on fissure veine be bounded by straight eurface lines, and that all right to mineral contained therein shall be confined to within vertical planes passing downwards through said boundary lines, argue themselves totally ignorant of the nature of fissure veins and the whole subject under consideration; consequently their recommendatious should carry no weight with Congress." A protest was entered againet any change whatever.

The bill as it etands now will be destructive to the mining interests, so far as prospectore and other poor men are concerned. The provision compelling the prospector to take a Deputy U. S. Surveyor to the ground within 90 days, is absurd, nonsensical, wholly uncalled for, uselese and burdensome.

Minere now are spreading ont into Arizona, New Mexico, the lower part of California, Nevada and other new regions. To take a eurveyor to some of these places would often involve a trip of several hundred miles and cost from $20 to $25 per day for the whole trip. Half the prospectore find it hard work to pay for grub, much less useless surveyore. The claim may be worth nothing at all. Ninety daye gives little time to prove its value. It puts miners to useless expense and loss of time. They are given a year to find mineral from which to get money, but only three monthe to find a deputy mineral eurveyor and the Surveyor-General's office, to pay out money.

Petitions or remonetrances shonld be gotten up in every camp and forwarded to our Senators to head off this bill. Meetinge of *practical miners* should be held and resolutions adopted, so that Congress will see before it is too late what harm is about to be done.

We have got a pretty good law now. We do not want any changes. Tinkering with the laws has become a fashionable amusement to a certain class; but the miners want no changes. They want to be let alone. The ideas of a dozen or two men, whose only interest is to gobble up all they can, ehould never be considered as representing those of the mining community at large. But eomething muet be done, and that quickly, to etop thie particular bill. Miners everywhere should meet and prepare remonstrances. If this bill passes as it etands, prospectors might as well throw away their picks and shovels and go to digging clams or planting potatoes.

MAP OF COMO.—We have received a map of the Como lode, Palmyra and Indian Spring dietricts, Lyon county, Nevada. It has been compiled from the latest authentic data by Wm. Rose, who has previously made eimilar maps of other districts. It ehows the town of Como, and the relative position of all the claime in the districts. Published by Payot, Upham & Co., of this city.

THE James single track railroad system was successfully tried this week at Antioch.

A Look Around and Ahead.

In common with the other countries on the Pacific slope California has for several months past been snffering from the inconveniences incident to a long and rigorons wintsr, the evils of which have, in our oass, been aggravated somewhat by a depressed condition of the labor market and other adventitious circumstances. The past has, in fact, been with ns an exceptionally hard winter, in both a meteorological and indnstrial senss. But our condition, thongh attendsd with some hardship, is not so very deplorable, certainly, by no means a desperate one, the prospect being that our affairs are likely soon to undsrgo a changs for the bstter. Never was the outlook for all our leading material intsrests better than at this moment. Our mining industries are in a healthy condition, while a prolific harvest of the cereal crops may bs considsred almost assnred. In the prospective abundant supply of watsr, our miners have the promiss of a prolonged and prospsrous working season, which, having already opened, will not, aftsr the long prevailing low temperature, bs likely to suffer further interruption from this causs. From our hydraulic mines it is agreed on all hands that a good account may this year be expected. In the field of vein mining thsre will also be more of that practical, telling sort of work done than ever before. If speculative opsrations shall suffer some diminution, thoss of a useful productive kind will bs incressed, and we think we hazard little in predicting for California a year of general progress and prospsrity.

Not only so, but, for our near neighbors, it strikes ns there is in reserve a like period of thrift and advancement. Many of the mines of Arizona, more especially thoss in the southerly part of the Territory, ars developing into grand proportions, the ownsrs of some single properties there having absolutely rsjected an offer of a million dollars for them, and, in some instances, as much as a million and a half, if reports be trus. Eastern capital is being strongly attracted toward that eection of country, and probably not without good reason.

In Nevada, hundreds of claims that have long lain dormant, or been but little explored, for want of capital to open them up, will this year be resurrected into new life; the owners, tired of importuning others to help them, taking hold and developing them with their own labor.

From Utah, well authenticated accounts reach us of a great gold find in Bingham Canyon, an old mining locality, lying some 30 miles southwest of Salt Lake City. These are the first gold quartz mines ever found in that Territory, where the discovery—both on account of its magnitude and novelty—has awakened a lively interest and already attracted the notice of the Eastern money magnates, some of whom have invested largely, through agents eent out for the purpose. Utah, through her central position and the character of her ore deposits, occnpies a vantage gronnd largely peculiar to herself. In the heart of the Territory centers a great railroad system, facilitating intercourse with both the Pacific and the Atlantic sides of the Continent. Her mining population are, therefore, in a more favorable situation for receiving monied assietance from outside eources than are the residents of any other country west of the Rooky mountains—it being the case, at the same time, that they require such assistance less, perhaps, than any other. The prevailing oree in Utah are those adapted for smelting pnrposes. These are generally of easy extraction, and the miner, having gotten out a lot of ore, large or small, can at once get the cash for it at the smelters, of which there are alwaye some convenient to the principal mining districts. As the California placer miner can readily convert his gold dust into coin, so can the Utah silver miner make euch conversion of hie ores as soon as he gets them out of the gronnd.

Colorado, Idaho and Montana will each abound with lively mining camps the coming summer, Leadville and the Gunnison country promising to be in Colorado the central points of attraction, while the Carribou and the Salmon river mines will have the call in Idaho, and the Butte district in Montana. Aside from these centers of special interest, mining for the precious metale will be generally active in these eeveral countries, where this industry has now become wide-epread and firmly planted.

As for California, her industrial condition, as marked at the outset, is not only hopeful, bnt in every way enconraging, the accounts of our industrial depression and eocial disorder, as published by the Eastern press, having been grossly exaggerated. For a season times here have been a little dull and thinge looked somewhat gloomy, but the clonds are lifting all around the horizon, and the day epring of a better era eeems to be at hand. Under the bsneficent influences of milder weather and a growing spirit of conciliation, business will revive, conflicting interests be harmonized and hard feelings allayed, insuring general prosperity and abiding peace. Let the Eastern people and the Eastern press forbear their sad vaticinations, nor waste more of their dolorous eympathy on California.

THE Oroville *Mercury* eaye that the Chinamen who are working mines in the lava bed district are making a good deal of money, ehipping $15,000 per week.

Central Plumas.

Owing to the snow blockade that has for ssveral months past impeded intsrcourse between the central portions of Plumas county and the outside world, we have not in the interior heard much about mining operations in that locality. Through a rsliable sonrce of information we lsarn, howsver, that work there has been kept up pretty steadily on many of tho quartz and drift claims, despite the deep snow and long-continued cold weather.

Thsre ars thirtssn qnartz mills in this part of Plumas, carrying a total of about 200 stamps, of which nearly one-half are rnnning, viz: The Plumas National, the Gresn Mountain, the Gold Strips, carrying 20 stamps each, and the New York, the Soda Cresk and the Genesee, 10 stamps each. The Crescent mill and the Union, each 24 stamps, the Indian Valley 20 stamps, the Kettle 15, and the Monitor and the Wisconsin, sach 10, are not running, some of them because the water they depend on for their propulsive power is frozen up, and others for the reason that they have no ore on hand. The ore body in the Crsscent mine, on which the company's mill had been running successfully for a great many years, having lately givsn out, new hoisting works havs been erected with a view to exploring for another ore body known to exist at the point whsre sinking is going on. Ssveral other of thsss companies ars also searching aftsr deposits of ore, or developing those already found, the prospect bsing that most of the idle mills will bs started up in ths courss of a fsw weeks, with fair stocks of ore.

Two or three Eastsrn companies, owning mines hsre, ars running thsir mills and driving work ahead with spirit, and, although their properties are not what may bs styled big, they promise, under their present snsrgstic management, to prove paying institutions.

There are a number of excsllsnt drift claims in that section of country, some of which have besn worked all wintsr, while, on others, work will soon be commenced. Among ths lattsr is the Meeker property, on the north fork of the Feather river, which hae been well opened and outfitted and will this spring be operated both as a hydraulic and drift claim. Beyond the neighborhood we are speaking of there are no mining operatione in progress and, in fact, no mines in this district lying at the northern extremity of the Sierra Nevada or main California gold belt. The gold field that covers so much of Shasta, Trinity and other oceanward-lying counties, is eituated further west in the outspreading Coast range mountains, and is separated from the Sierra Nevada by the Sacramento valley and the Shasta plaine lying at its head.

Foundry Notes.

There was completed this week at the National Iron Works, a pair of 18x72 engines for a etern-wheel steamer which is to ply on Fraser river. She will be particularly employed in carrying railroad iron and tiee for the Canada Southern railroad. The steamer is now in process of construction and will be 163 feet long, 30 feet beam and four feet depth of hold. Her wheel is 18 feet 6 inchee in diameter and has 15 arms, with buckets 20 feet 10 inches. The boiler is 64 inches by 31 feet 6 inches, and has a tubular heater 10 feet long.

The enginee weigh, including the shaft and wheel irons, about 20 tons, and their combined power is abont 500-horse power. They are made with all the latest improvements as etern wheel practice allows. They are provided with Crose' patent cut-off, poppet valves, etc. The lifters for moving the levere are of new form, and the throttle valve ie a poppet throttle, balanced. The pitman rods are 30 feet long between centers. The cranks are wrought iron, and the wheel shaft, 25 feet long, ie of hammered iron, nine inches in diameter. The engines are very strongly and neatly built, and form quite a creditable job. It was intended at first to have them made in the East, but when the freight from the East was conoidered, they were more cheaply built here.

The eteamer in which the machinery is to be placed is of somewhat different ehape from those in use on our rivers. The drawings ehow her to be much narrower aft than is usual with us, and also somewhat sharper forward. She ie being built for Capt. John Irving.

RICH ORE.—Eight tons of ore from the Alley mine, Ivanpah, reduced at the Hofmann & Mendheim works, has netted $8,500. The mill of the Ivanpah Con. mine, after undergoing extensive repairs, started up on the 1st inst. It is annonnced that after the first bullion shipment, the Ivanpah Con. stock will be lieted on the board.

SKAGIT MINES.—From reliable news received from the Skagit mines, we learn that the depth of snow in and around Ruby creek is eight feet, which will probably prevent any work from being done before the 1st of June, or later. It is not advisable therefore to etart for Skagit just now.

THE Atlantic and Great Western Railroad Company hae been metamorphosed into the New York, Pennsylvania and Ohio Railway Company.

Mining Reforms.

Some of the Eastern mining companies are demanding bonds from the presidents and secretaries for the faithful discharge of their duties. There is no good reason why this should not be done in all cases; more especially in those cases where the stock and business transactions become very important, and where the facilities for malfeasance and the temptations to fraud are consequently great. It would give additional confidence to those who were inclined to invest in mining, as it would evince a security that does not now exist. There would be something to fall back upon in case of error purposely committed, and where, without these bonds, nothing could be obtained by the losers. It generally proves to be the case, when a defalcation in the funds occurs, or an over-issue of stock transpires, that the guilty one has nothing which can be applied to the liquidation of the deficit. He is usually irresponsible, financially; his expenditures—in extravagant living or in speculations—have absorbed all of his stealings, and his assets are vaporous and intangible.

It is impossible to guard against dereliction in officials in mining or other corporations, where the determination to steal exists. But a greater safeguard would be placed over the actions of those who are prone to error if a very rigid scrutiny was at all times instigated over their official acts, and extended to a just surveillance over their private career. "An honest man is not afraid of being watched; a rogue needs to be," is a truthful adage. While it might be somewhat annoying to a sensitive person to be aware that he was under a continued scrutiny, still he would, so long as innocent, possess a fearlessness, from his conscious rectitude, that a knave could never enjoy. But it is a duty that the companies owe to those who invest in them to see that no misappropriation of their funds is made. The investors cannot have the opportunity of auditing all accounts, or of following the issuance or transfer of the shares of stock. They have their own individual matters to attend to, and cannot supervise the details of the company's transactions. They must trust their interests to the board of directors, and they expect them to be faithful. If the bonds were required from the directors as well, perhaps they would keep a better watch over the actions of the presiding officer and secretary. It is a good move, and in the right direction, and it is to be hoped that it will become so general among mining companies that it will be considered as a matter of course that such bonds must in all cases be executed.

The Eastern companies have also reduced all salaries 50%. In many cases this is a desirable movement on the score of economy and business-like reduction of expenditure. Where the salaries have been far above the value of the services rendered, it is well to reduce them to the basis of a just recompense for acts performed. But to make an indiscriminate reduction would be injudicious. It would, in some cases, be adverse to the interests of the mine; because, where a superintendent had been receiving only the amount he was justly entitled to—when his ability and knowledge of his profession were taken into account—if his rightful salary was reduced one-half, he would undoubtedly resign, and, at that price, the company could not obtain any but an inefficient man for that position, and the interests of the mine would be jeopardized thereby.

The mooting of reduction in expenses in mining affairs is certain to operate advantageously for the general welfare of the mines. The same close attention to economy in the management of them is as necessary to be inculcated and practiced as it would be in any other business. There has been too much recklessness in mining outgoes for expense account. It has been a leading cause in the failure of so many mines; and it is to the attention turned in this direction that mining has advanced so rapidly within the past very few years.

Strikes in the East.

With the advent of "good times" in the Eastern States and increase of business, comes news of strikes and impending strikes. Among the iron workers this has been expected some time. In that business for several months they have been behind with orders, having more than they could properly attend to. This is in all the different classes of iron working, hardware, etc. Some of these are two or three months behind with orders, which continue to accumulate.

We see by a dispatch on the 15th from Harrisburg that the puddlers are on a strike for $6 a ton. Mill-owners offer $5.50. The puddlers of Reading demand an increase to $6 from $4.50 per ton.

At Buffalo the puddlers and rollers of the Union Iron Works, receiving $5.50 per ton, struck for $6.25. An extra police force is on duty at the works.

At New York the lockout of men in piano factories began on Monday. Those in forced idleness voted to demand 15% increase of wages before returning to work.

At Chicago about 400 furniture frame-makers make a demand on Monday morning for an advance of 15% in their wages, and on refusal, they struck. They claim that many hundreds more will shortly join them, while the furniture-makers express confidence that the strikers have no backbone.

At St. Louis all the mechanics of the Missouri Pacific Railroad machine shops in the western part of the city, numbering about 400, struck on the 16th for 10% advance in wages.

Eloquence of Labor.

Eloquence to be effectual must be impressive. It must, to awaken sympathy, possess magnetic influence combined with essential verities. It must, while appealing to thought, be able to arouse impulse. It must be based upon facts and be instigated by the necessity of the occasion. These are the leading qualifications to make eloquence productive of the desired results. Its minor features are but subdivisions of its above enumerated concomitants. All these requisites, and even more, are possessed and continually practiced by labor.

It is impressive because it shows the results of its efforts. It speaks in a language that cannot be misunderstood, of the benefits which it is ever and always competent to obtain. It shows that its acts are causes which conduce to the accomplishments of its desires and its designs.

In appealing to sympathy with its unmistakable truths, it points to its ntile creations and to its additions to the wealth and the welfare of nations, and awakens the desire to emulate its examples in so meritorious a cause. It shews how the world is made productive and its barren places caused to become fruitful. It tells of the banishment of sterility from the soil and the installation of a prolific epoch in its stead. It arouses the energy of the agriculturist and nerves him to more strenuous exertions to derive increased yields from the land. It incites the artisan to the creation of new mechanical devices through whose assistance widely extended manufactures are disseminated.

It engenders impulse by its bold and vigorous instances of successful manipulations, and appeals to the investigating and thoughtful mind by its array of incontrovertible facts regarding the benefits it is able to confer upon mankind.

Its eloquence never ceases; from the rising of the sun to the going down thereof, its utterances are continued with all their convincing arguments. Its language never descends from sublimity of conception, or falls to the vain, frivolous or futile. It adapts itself to the comprehension of the unlettered, and fascinates the scholastic with the purity of its diction. It holds out no wild inducements, it utters no falsehoods, it speaks only of well-proven truths. It asserts no false dogmas, it deals not in sophistry and it abhors prevarication. It breathes no insinuations, but it ever gives voice to decided and plain assertions.

Its most potent arguments are uttered in its moments of most earnest toil. While striving to its utmost tension it is most convincing. Its proofs are omnipresent, self-evident and irrefutable. It recognizes facts and ignores postulation. Its voice rises whenever the sound of labor breaks upon the stillness of the air, and while toil continues it never relapses into silence. Each deep-drawn breath of the worker is its intonation of argument, while the result of his exertion is its correlative proof. Its eloquence is generated in the narrow apartment of the half-famished seamstress by the faint tone of the cloth-piercing needle, as well as in the rushing sound of the most remote and extensive sun in the stellar universe. It finds its audibility in the silent brain thought of the inventor, through whose telephonic power it causes itself to be heard by the people of nations.

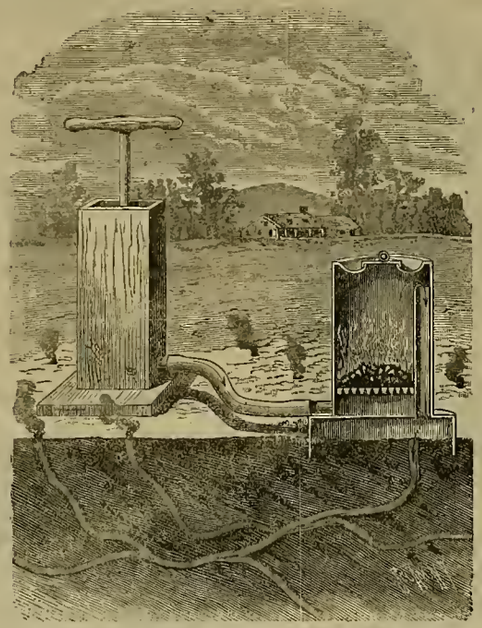
It is god-like in its power, for it is omnipotent in its persuasiveness; equally so in its verity, for truth is its solid basis. Since the incipiency of creation it has never been silent. Its tones pervaded space with their harmony ere man came into existence, for it gave voice to the stars when they sang together their rhythmic hymn of joy and adulation. And now that man does exist, it exerts itself for the promotion of his welfare, and all its utterings are for the advancement of his prosperity and to his benefit if he will but heed purport of them.

Academy of Sciences.

The semi-monthly meeting of the California Academy of Sciences was held on Monday evening, Prof. Davidson in the chair. Messrs. W. F. Buswell, A. Roman and W. F. McAllister were elected resident members.

Donations to the museum were as follows: From E. E. Hewitt, of Los Angeles, through B. B. Redding, Indian pottery, foot-ball and basket, from Pimo and Maricopa Indians; stone-hammer, head of war club and stone implements from Casa Grande, Arizona. From George Dutton, a fossil oyster, *Ostrea Titan*, found on Santa Lucia mountains, Monterey county, California. From Elisha Brooks, ten aquatic birds. From Spence & Johnson, three *Pandalus* and one *Octopus*. From Henry Chapman, skull of an African lion, who was 27 years in Montgomery Queen's circus. From Andrew Garrett, 70 species of Society Island ferns.

Dr. Eugene Dupuy delivered a lecture on the subject of hereditary transmission of lesions of nutrition. Dr. Dupuy has been the collaborator of Dr. Brown-Sequard, the eminent experimental scientist, in experiments having for their direct object the ascertainment of the transmissibility in generation of lesions of nutrition. The Doctor said that, for many purposes—among them being that of deciding the inheritability of injuries to the nerves—experimentation is better than discerning. The particular lesion, the transmissibility of which to offspring it is desired to test, can be inflicted on one of the lower animals. For various patent reasons, a specified nerve or a predetermined lobe of brain can be more conveniently crippled or destroyed in guinea pigs, cats, dogs and pigeons, than in humans. The lecturer and Dr. Brown-Sequard experimented on all the first four classes of animals, but most numerously on the guinea pig, for several excellences for the purpose possessed by the latter, the chief among which is its capacity for the innumerable multiplication of itself into swiftly succeeding generations. The guinea pig has three toes. It was found that by injuring, without destroying the nerve of these toes by either one of the gentle processes of dividing, tearing or burning it, the pig lost the use of two of its toes; that the pig, with some instinctive idea of economy, then bit the useless toes off, and that it was subsequently afflicted with nervous twitchings, increasing to convulsions, with foaming at the mouth and all the other symptoms of epilepsy in humans. Other ingenious ways of injuring other nerves or removing portions of brain were practised with equally pleasing results. The progeny of these parents were born with only the one toe that had remained uninjured in the ancestor, and as they grew, all the symptoms that had appeared in the ancestor after the lesion, appeared also in them. The guinea pig, being more plastic than the human, frequently recovers entirely from these lesions. The lecturer had the seventh generation of animals of an ancestor upon which a lesion had been made, and even the bone structure of the head was so different from that of normal specimens that, if their bodies were concealed, they could not be told from their heads to be guinea pigs. Experiments were made with equal success on animals of other species, but the results had not been so accurately ascertained, because, as a general thing, the animals died. The lecturer had known a lady in England, two of the fingers of one of whose hands had been disabled by machinery accidentally, and in such a way that the nerves had been injured. A daughter subsequently born to her was born similarly disabled. A gentleman and his wife, living in New York, had each had their right hand disabled, and was compelled to do all manual acts with the left. Their five daughters—a son and a grandson—each, involuntarily, did also with the left hand whatever was being done by the right. The doctor thought California, with all its other undisputed charms, to be also a delightful place for the study of the transmissibility of the lesions of nutrition, because accidents in the mines are so numerous.



MELCHER'S SQUIRREL AND GOPHER EXTERMINATOR.

Legislative Matters.

The Revenue bill, passed finally last week, has not, at present writing, been signed by the Governor, and is still being vigorously discussed, pro and con, in hopes of influencing his Excellency.

The Assembly passed the bill fixing the hours of labor of drivers and conductors of street cars at 12 hours.

The famous Gorley mining bill was finally defeated in the Senate, much to the relief of all brokers.

The substitute bill by Hittell, for removing officers of mining corporations by the shareholders thereof, has been read a second time and ordered to engrossment.

Streeter has introduced a bill providing for the continuation of the irrigation investigation by the State Engineer, and appropriating $30,000 therefor.

The question of riparian rights is exciting a great deal of attention. The Senate has already passed a bill declaring that they only apply to water for domestic purposes and the watering of stock, and Assemblyman Sayle, of Fresno, introduced a bill adding a section to the Civil Code, abolishing them altogether. The bill is as follows:

"The rights of riparian owners and prospectors, as defined and enumerated by the common law doctrine, is hereby abrogated and declared not to exist in this State, provided that the provisions of this act shall not in any manner be construed to affect the vested rights of riparian owners already existing prior to the passage of this act."

Brown's bill provides for an irrigation and debris system supplemental to the State Engineer act of last session.

There are still a great number of bills to be considered by the Legislature, and the rest of the session will be devoted to hard work in clearing them off.

Gopher and Ground Squirrel Destroyer.

We give on this page an illustration of a gopher and squirrel destroying apparatus devised by an ingenious Texan inventor. The arrangement and operation are both simple and could almost be learned from the engraving alone. It may, however, be said in explanation that the invention consists in a fire chamber, having around the bottom a sharp flange which cuts into the ground around the gopher or squirrel hole, forming a tight joint. The fire chamber has an air space under the grate, which communicates with the air-forcing pump through a short section of flexible tube. An internal pipe extends from the bottom of the fire chamber upward to convey the poisonous fumes from the top of the chamber down into the chamber formed by the flange.

A fire having been made in the fire chamber, a sulphurous compound is dropped in upon it, and the opening in the top of the chamber is closed. The air-forcing machine being started, all of the smoke and poisonous vapors are forced down into the hole, killing everything animate with which it comes into contact.

The air-pumps are made of the very best and well-seasoned lumber, 11x11 and 34 inches high, with valves and piston, working very light and true, making 30 strokes per minute at ordinary working. At each stroke 2 cubic feet of air is forced into the hole, sufficient to fill a two-inch squirrel hole nearly 2,000 feet long in one minute, if no smoke or wind escapes.

This device has been used quite largely in Texas during the last year, both in suffocating gophers and in destroying the cutting ant which infests some parts of that State. It was awarded a diploma at the Texas State fair October 28, 1879. The inventor is J. C. Melcher, Black Jack Springs, Fayette county, Texas, from whom any farther particulars concerning the apparatus and its working can be obtained.

THE suit of the Justice mining company vs. Schultz & Von Bargen has been decided in favor of the defendants on the ground that they extinguished their obligations, if any, by an accordant satisfaction.

A Thriving Northern Town.

In a petition addressed to the Legislature for a branch Normal school at Reading, Shasta county, we find the following claims of the advantages of that growing town and prosperous region: The town of Reading, in the county of Shasta, is located at the terminus of the California and Oregon railroad, 169 miles north of Sacramento city, and 150 miles south of the Oregon line. Its business patronage comes from those residing in a circle, reaching from Chewaukan valley, Oregon, to Hay Fork, Trinity county, California, and extending through Modoc, Siskiyou, Trinity and Shasta counties, California, Lake, Jackson and Douglas counties, Oregon, and reaching back as far as 250 miles from the town. Travel to and from the town is accommodated by the California and Oregon railroad to and from the south daily; and by three daily lines of stages, one tri-weekly and one daily express to other parts of the country.

It is more healthy than the average California towns, because it is situated on high table lands beyond the reach of miasmatic influences, and yet it is below the snow line; although snow falls here it seldom remains more than twenty-four hours. The water is most plentiful and pure, the soil most productive. Fruit of all kinds is raised in abundance, as well as the orange, while the most tender shrubs and plants thrive luxuriantly in the open air. The scenery is grand and beautiful beyond description, embracing in its range the heaven-towering and ever snow-capped Mount Shasta, Mount Lassen and many other snow-covered peaks, together with the termination of the Sacramento valley.

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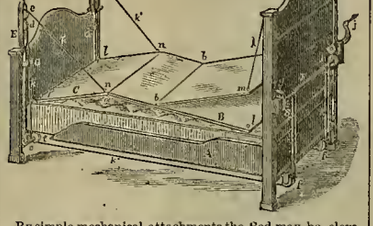

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Ore Pulverizers.

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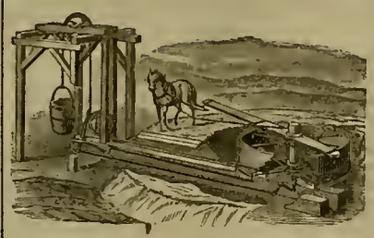

MINERS' HORSE-POWER.

This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.
The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing

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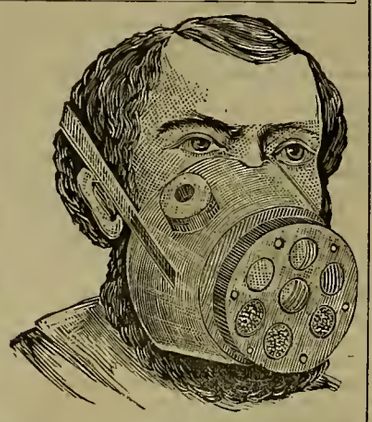
Prevents Lead Poisoning and Salivation.



INVALUABLE to those engaged in Dry Crushing Quartz Mills, Quicksilver Mines, Guano Works, White Lead Corroding, Feeding Threshing Machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and if not satisfactory the price will be refunded. Price, $3 each, or $30 per dozen. Sent post-paid to any address upon receipt of price.

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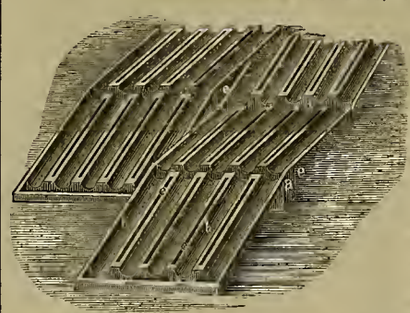

This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

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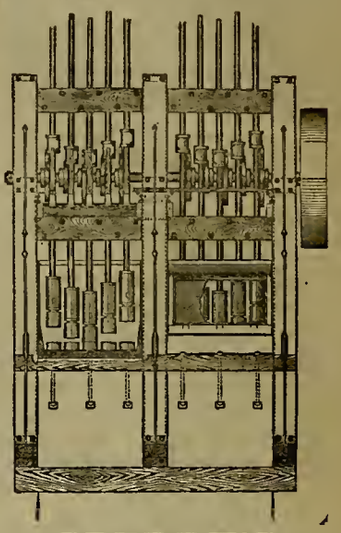

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Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.
We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

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We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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The "Little Wonder" Self-Calculating Sample and Button Weigher (Patented).....	25 00
Blow-Pipist's Pocket Laboratory of Tools, Fluxes, etc	50 00
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Assaying and Testing Taught.

A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. O. Hoagland, S. & J. Newsom, B. Henrickson.

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CONTINUED FROM PAGE 181.

length of the claim the ore crops out and assaye as bigh as $1,960 have been made, and averages of about $200 shown from a large number of assays. The ledge shows six and seven ft only in prospect shafts. One shaft is down nearly 22 ft. At a depth of 50 ft they will crosscut to demonstrate the width of the vein. A person can walk on the croppings lengthwise of the claim 1,200 to 1,300 ft.

TOMBSTONE ITEMS.—Cor. *Arizona Star*: The Grand Central is now raising from its lower level some of the richest ore ever found in the mine, and the rich ore is enlarging. It is over 17 ft in width, and looks as if it was the bonanza of this camp. A rich strike has been made at the east side of the Dragoon mountains, near the Turquois country. Silver glance is seen in the ore. Also, at the south end of the Dragoons, some recent discoveries are looking more than well. The veins are strong and wide, and free gold can be seen even in the croppings. Also, above Cachise pass another new find has been made, that at a depth of five ft has an eight-ft vein of fine looking ore. The Jersey Blue, in the Dragoons, has a four-ft vein with rich sulphurets of silver ore. It is in the foothills on the east side. On the Red Jacket and Young America claims, near town, a quartz vein has been struck that has free gold in specks. The Minerva mine has four shafts on the line of the vein all in ore. It is a true vein all in granite.

TUSCAMBIA.—Prescott *Miner*, Mar. 5: Has a tunnel 275 ft in length following the ledge all in ore. There are two shafts, one of 110 ft and one of 90 ft in depth on the ledge which expose the ore body for a distance of 800 ft. Three tons of ore from this mine milled at the Peck mill, yielded $981 per ton.

SILVER PRINCE.—A new discovery has been made within three ft of the old workings. The ore vein discovered crops out for 60 ft, is 10 inches wide, and has chlorides in with the grass roots. Average samples taken from this vein go from $800 to $1,300 per ton.

OROOM CREEK.—George E. Berry recently discovered, on Groom creek, a gold-bearing ledge which shows a body of rich ore from four to five ft wide within a few inches of the surface. The rock is somewhat decomposed, and from prospects made from the surface dirt indicates that it will pay well. The Parker mine has recently been opened by a 160-ft tunnel and a fine body of ore developed. A. J. Rupert recently opened up, near the Benjamin, a claim discovered by him. The pay streak is 28 inches wide, and prospects well in free gold.

TONTO BASIN.—Reports from Tonto Basin show a great deal of activity in mining matters and some rich strikes. In Sam Hill's Zulu mine the shaft is down 50 ft, and the ore is apparently of equally good quality with that found near the surface, assays from which gave $180 per ton. The ledge is of unknown width at the depth reached, as the vein has not yet been cut across. It is estimated at from 12 to 14 ft.

COLORADO.

GREAT REPUBLIC.—Georgetown *Miner*, Mar. 11: This lode is situated on Revenue mountain in Geneva mining district. It has two tunnels and a shaft. The upper tunnel is 50 ft in length, and has in the breast a four-ft vein of quartz assaying 107 ounces silver per ton. The ore carries galena, copper, bismuth and a little gold. About 650 ft down the mountain is tunnel No. 2. Here they have drifted some 50 ft, but as yet have not gotten through the slide. The shaft is 700 ft above the upper tunnel and is but 10 ft deep, but shows the same character of ore as exists in the lower workings.

LUCKY HESPERUS.—A rich strike has been made. They are stoping above the tunnel level on a good body of rich ore. From a recent mill run of 4,700 pounds the returns are as follows: 1st class, 1,048; 2d class, 495; 3d class, 211 nunces silver per ton.

MAGNET & SEQUEL.—The upper adit is in 375 ft and the lower one 250 ft. A large amount of stoping has been done over them with good results, the ore milling from 100 to 300 ounces.

LEBANON.—There are from 1 to 10 inches of pay in the different stopes, and from two to six inches of solid ore. The last run of ore milled 430 and 220 ounces of silver per ton.

MENDOTA.—In the stope west of the shaft, at a depth of 100 ft, there is a vein of ore from a foot to 18 inches in thickness, which is perfectly solid, and will run from 50% to 65% in lead, and from 30 to 100 ounces in silver.

SAGINAW.—On the day of discovery $125 was taken from the apex of the lode, the ore consisting of fine-grained galena, silver glance and black sulphurets, and milling 900 ounces of silver per ton. Specimen assays have run up to 1,000 ounces.

ROE.—Stoping and drifting is progressing on the level west of the shaft, the stope carrying ore that mills 235 ounces for one class of ore, the concentrations from the same place running $45 per ton.

HERCULES.—On the Hercules tunnel level two winzes are being sunk west of the engine shaft. These winzes are 35 and 25 ft deep respectively. West of the gulch two adit levels are each in 500 ft. Recent mill runs from the upper one returned 500 ounces of silver per ton for unclassified ore.

EMMA.—The last run of ore milled 1,264 ounces for first-class and 419 ounces for second class. Other runs milled 703 and 515 ounces of silver per ton.

BIG PINTO AND LITTLE MARY.—The pay streak in these bonanzas is from 10 to 15 ft wide, and assays from 79 to 90 ounces silver per ton, besides they carry a good deal nf gold.

QUEEN OF THE WEST.—A run from the discovery recently reported, of a half ton, gave a returu of 132 ounces silver per ton.

New Incorporations.

The following companies bave been iucorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

SOUTH IDAHO QUARTZ M. Co.—Mar. 3d. Location: Nevada county, Cal. Capital, $300,000. Directors—A. Teal, E. C. Webster, W. A. Nygle, C. H. Moore and A St. Paul.

GOOD FAITH M. Co.—Mar. 3d. Location: Columbus district, Nevada. Capital, $10,000,000. Directors—John Skae. Joseph Clark, William Dutch, C. O. Funk and Chas. Warren.

VENTURA M. Co.—Mar. 4th. Location: Marin county, Cal. Capital, $10,000,000. Incorporators—E. H. Wiley, W. S Edwards, J. C. Chalmers. Frederick Franks and H. P. Wood.

BODIE QUEEN G. & S. M. Co.—Mar. 5th. Location: Bodie, Mono county, Cal. Capital, $1,000,000. Directors—Wm. H. H. Hart, Leander Shores, George S. Carrier, A. H. Todd and J. L. Armstrong.

PARIS M. Co.—Mar. 16th. Object: To operate in California. Capital, $10,000,000. Directors—Wm. Stewart, Wm. F. Herrin, Wm. J. Hutchings, Thomas B. McCauley and Frank Vernon.

THOR & BRIGHT POINT M. Co.—Mar.16th. Object: To operate in Utah Territory. Capital, $3,000,000. Directors—George W. Deltzler, Wm. C. Pease, P. Franklin, Wm. S. Campbell, Samuel Purdy and J. D. Lomax.

CANDELARIA M. Co.—Mar. 17th. Object: To operate in Nevada. Capital, $10,000,000. Trustees—J. B. Russell, Wm. E. Norwood, S. Iglauer, Oscar R. Jones and Cornelius Reilly.

Meetings and Elections.

ATLANTIC GIANT POWDER CO.—The stockholders bave elected the following officers for the ensuing year: President, P. A. Dibble; Vice-President, E. Judson; Secretary and Treasurer, N. Duperu.

THREE HUNDRED members of the Tammany General Committee will go to the Cincinnati National Convention.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING MARCH 9, 1880.

225,204.—TIN VESSEL—O. J. Backus, S. F.
225,205.—ATTACHMENT FOR DREDGING MACHINES—J. A. Ball, Oakland, Cal.
225,322.—PAPER-BAG MACHINE—E. O. Bennett, Santa Clara, Cal.
225,378.—PEACH STONER—J. K. Hogan, Placerville, Cal.
225,396.—HAY PRESS—L. B. Lathrop, Hollister, Cal.
225,397.—SIGNAL LANTERN—R. W. Lewis, Sacramento.
225,263.—GRAIN SEPARATOR— H. E. Wright and R. Shubb, Stockton, and J. Klees, Sacramento, Cal.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

HAY PRESS.—Levi B. Lathrop, Hollister, Cal. Patented March 9, 1880. No. 225,396. The object of this invention is to construct a press for baling hay, wool, cotton, hops, etc., which shall be light and portable, and at the same time strong and durable, to which end the body of the press is constructed of boiler and angle iron. The follower moves in guides and is actuated by a toggle joint, to which power is applied by means of a series of ropes and pulleys. By using peculiar stops any desired parts of the power of the purchase is cut off, so that the horses need not travel so far with the end of the rope, in drawing the toggle down, as they would have to do were all the parts of the purchase moving.

When the pressure is applied the first time only part of the purchase is used; but on the last purchase being applied the stops are removed, and the whole power of the purchase is utilized. The pulleys or sheaves over which the ropes pass are journaled on the hinge-pin of the knee-lever, so as to do away with the use of blocks, and allow the lever to be straightened without too much space being occupied by the purchase.

PAPER BAG MACHINE.—Edward O. Bennett, Santa Clara, Cal. Patented March 9, 1880. No. 225,322. This invention relates to certain improvements in that class of machines for folding and pasting the bottoms of the already-prepared tubes, and at the same time supplying the requisite amount of paste for securing the edges, and also in the mechanism whereby this device is operated, and for regulating the pressure on the pile of bags. A perfect satchel-bottomed bag is formed with very little hand work. The operation of folding and pasting is performed quite rapidly, and there is no danger of the paste being scattered about over any part of the bag except that where it is necessary to be applied.

News in Brief.

VALLEJO has a new evening paper, the *Daily News*.

NAVIGATION is again suspended on the Hudson river.

SIR GARNET WOLSELEY will return to England in July.

A FREIGHT-STATION has been built at Army Point, Benicia.

FORT STEVENS, Or., is in danger of destruction from the sea.

A SCHEME is maturing for uniting the German and Baltic oceans.

SIXTY Italians for San Francisco arrived at New York March 13th.

THREE Negroes are to be hanged for murder in Washington April 30th.

C. C. TAYLOR, city editor of the Philadelphia *Times*, has committed suicide.

APPALLING famine reports continne to come from Armenia and Kurdistan.

THE jury disagreed in the case of Robert Linsey at Ukiah for murder.

THE Pope approves the Archbishop of Cologne's condemnation of Socialism.

THE troubles between the Greeks and Bulgarians of eastern Roumelia continue.

JOHN B. HAWLEY has resigned the office of Assistant Secretary of the Treasury.

THE steamship *Montana* was wrecked Saturday last on the English coast. No lives lost.

SLOSSON, the American hilliardist, has gone to Paris to meet Vigneaux, the French player.

THE wages of the employees of the Ohio and Mississippi railroad are to be increased April 1st.

THE destitute Indians in San Diego are being provided for by kind-hearted citizens of that county.

R. R. DONNELL, an ex-Assessor, was arrested at Bakersfield on Saturday last on a charge of felony.

WM. F. TAYLOR, late Auditor of Public Accounts, was found dead in his bed recently in Richmond, Va.

CHUNG HOW, late Embassador to Russia, has been beheaded, and a revolt has broken out in Pekin.

MISS ADAMS, who caueed the recent sensation in Cincinnati, charges her nncle with being the cause of the trouble.

A ST. PETERSBURG dispatch says that Melikoff's life was saved by a chain shirt in the recent attempt to assassinate him.

A FIRE broke out in the hold of the Pacific Mail steamer *City of Sydney* on Sunday, in this city, doing considerable damage.

P. E. BENEDICT, of Monte Vista, Los Angeles county, claims to have discovered the secret of making fine white crystallized sugar from honey.

ACCORDING to the Dixon *Tribune*, the late Dr. H. H. Toland was the largest individual tax-payer in Solano county. He was assessed last year on 11,601 acres of land in Rio Vista township, 6,081 acres of which was put down at $15 an acre, and the remainder at $5 per acre, making a total valuation, with the personal property, of $162,835, on which the taxes amounted to $3,093.86.

Proposed Changes in the U. S. Mining Laws.

The telegrams from Washington give an abstract of the suggestions of the report of the Land Commission, which visited this coast last summer in search of information. The questions involved in this report are of the utmost importance to the mining community. One recommendation is for the abolition of the present system of locations and substituting the square location, the boundaries of which extend vertically to an indefinite depth. This will no doubt do away with a good many lawsuits and disputes.

In Major Powell's minority report he suggests several important amendments affecting the disposal of pasturage and mineral lands. First of these is as follows: In lands patented under the provisions of this chapter all subterranean mining property and rights for mining purposes are hereby reserved from surface property and rights for pastnrage purposes, and whenever surface property and rights for pasturage purposes to any tract of laud have passed from the Government under the provision of this act, subterranean property and rights for mining purposes therein may be acquired under the provisions of the XIIth chapter of tbis act, etc.

It is also recommended that every patent issued for pasturage land shall contain the following clause: Except and excluding from these presents all subterranean property rights in any mine of gold, silver, cinnabar, lead, tin, copper, coal, iron or other valuable mineral deposit, and property conveyed in this patent shall be subservient to easements necessary for discovering and working mines therein, etc.

In all patents for mineral lands it is recommended that there be inserted a clause excluding all surface property rights, with the proviso, "That there shall be dominant in property conveyed, easements on the surface property necessary for the discovering and working of mines therein."

In support of these amendments to the bill prepared by the Commission, Powell uses the following language: "About one-half of all the lands in the western portion of the United States, bearing gold, silver and other ores of like geological occurrence, are covered with forests, and hence are both timber and mineral lands. Proviso has been made in the tentative bill for the sale of timber that the fee of the land is to remain in Government, and such lands are held free to exploration and acquirement of title as mineral lands."

The other half of these mineral lands are pastnrage lands. It is believed that the enactment of a pasturage law, as recommended by the Commission, without the amendment above indicated, would result in passing a large amount of mineral lands into the hands of persons engaged in pasturage industries, and thus the mining industry of the country would be greatly retarded. A pasturage homestead is necessarily very large, and if it is given to the settler he should not consider it a hardship if mines contained therein are severed from his ownership. It is believed that at least ninety-nine one-hundredths of all the coal lands of the western portion of the United States are situated in lands belonging to the class designated in the tentative bill as pastnrage lands. It has been recommended that coal lands be sold at $10 per acre, but in the Pasturage Homestead Act titles can be acquired to four sections of pasturage lands at a nominal price, and such lands might and will be defined properly as mineral lands—that is, they would contain beds of coal of commercial value. The Pasturage Homestead Act, without the amendments proposed, would defeat the measure designed to secure the sale of coal lands at $10 per acre.

The House Committee on pnblic lands, and mines and mining will hold a joint meeting shortly, to consider this report of the Land Commission. The snbject matter will thus, by agreement, be divided between the two committees for consideration and action upon subjects pertaining to their jnrisdiction respectively.

A full copy of the report will no doubt soon come to hand, when we shall give fuller details. Some further remarks on this snbject are made in another column.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to nur prospectus and terms of subscription, and request that they circulate the copy sent.

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Chew JACKSON'S BEST Sweet Navy Tobacco

Nothing short of Unmistakable Benefits

Conferred upon tens of thousands of sufferers could originate and maintain the reputation which AYER'S SARSAPARILLA enjoye. It is a compound of the best vegetable alteratives, with the Iodides of Potassium and Iron, and is the most effectual of all remedies for scrofulous, mercurial or blood disorders. Uniformly successful and certain in its remedial effects, it produces rapid and complete cures of Scrofula, Sores, Boils, Humors, Pimples, Eruptions, Skin Diseases and all disorders arising from impurity of the blood. By its invigorating effects it always relieves and often cures Liver Complaints, Female Weaknesses and Irregularities, and is a potent renewer of vitality. For purifying the blood it has no equal. It tones up the system, restores and preserves the health, and imparts vigor and energy. For forty years it has been in extensive use, and is to-day the most available medicine for the suffering sick anywhere.

FOR SALE BY ALL DEALERS.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Oruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

METALS.

(WHOLESALE.)

WEDNESDAY M., March 17, 1880.

IRON.—	
American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	— — @35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 8½
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 16
Plow Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 33
Sheathing, Tinned 14x48	— @ 42
Nails	— @— —
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	6 @— 6½
Bar	— @— 6½
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck, "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.—	
10x14 I O Charcoal	— @10 50
10x14 I O Coke	10 00 @10 00
Banca Tin	— @25 00
Australian	— @20 00
I. C. Charcoal, Roofing 14x20	— @10 00
" " " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	10½@— 11
NAILS.—	
Assorted sizes	6 50@6 75

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is herehy postponed until Thursday, Februrary 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is herehy postponed until Wednesday, the 7th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, 420 Montgomery St., San Francisco, Cal.

Cataract and Wide West Gravel Mining Company. — Location of principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment levied on the 2nd day of February, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. Shares.	Amt.
John H Floto	624	50	12 50
John H Carey	413	75	18 75
John H Carey	708	50	12 50
Thomas Bates	446	25	6 25
Thomas Bates	448	25	6 25
Thomas Bates	450	25	6 25
Thomas Bates	456	25	6 25
Thomas Bates	457	50	12 50
Thomas Bates	462	5	1 25
Thomas Bates	463	10	2 50
Thomas Bates	460	50	12 50
Thomas Bates	481	10	2 50
Thomas Bates	483	25	6 25
John D Barry, Trustee	577	1000	250 00
Virginia P Paul	636	10	2 50
Jno M Bowers	630	200	50 00
Thos F Baines	637	50	12 50
J E W Coleman	625	50	12 50
Robt Rostron	396	50	12 50
James White	419	20	5 00
James White	421	50	12 50

Names.	No. Certificate.	No. Shares.	Am't.
G Frederick	523	30000	7500 00
Theresa Bowers	551	100	25 00
Theresa Bowers	631	200	50 00
Theresa Bowers	632	50	22 50
Mary C Floto	547	400	100 00
Mary C Floto	548	100	25 00
Mary C Floto	601	500	125 00
Mary C Floto	623	450	112 50
Edwin McNevin	622	250	62 50
John Rostron	600	100	25 00
Emma Floto	604	500	125 00
George Floto	629	25	6 25
Wilber Curtis	633	25	6 25
Wilber Curtis	634	25	6 25
Wilber Curtis	640	50	12 50
Wilber Curtis	642	50	12 50
Wilber Curtis	643	50	12 50
Wilber Curtis	644	50	12 50
Wilber Curtis	646	25	6 25
Anne Silbitz	633	50	12 50
Augustus Silbitz	634	50	12 50
J T Steno	696	150	37 50
D Campbell	698	25	6 25
J M Bryan	699	226	56 50
A J Dowling	701	50	12 50
F F DuRose	703	500	125 00
A G Lawrence	706	500	125 00
Henriotta Siebock	716	50	12 50
Robt Reed	638	100	25 00
J C DeVoy, Trustee	331	1000	250 00
J C DeVoy, Trustee	332	1000	250 00
J C DeVoy, Trustee	333	1000	250 00
J C DeVoy, Trustee	334	1000	250 00
J C DeVoy, Trustee	335	1000	250 00
J C DeVoy, Trustee	337	250	62 50
J C DeVoy, Trustee	338	250	62 50
J C DeVoy, Trustee	339	250	62 50
J C DeVoy, Trustee	340	250	62 50
J C DeVoy, Trustee	341	250	62 50
J C DeVoy, Trustee	342	250	62 50
J C DeVoy, Trustee	343	250	62 50
J C DeVoy, Trustee	344	250	62 50
J C DeVoy, Trustee	345	250	62 50
J C DeVoy, Trustee	346	250	62 50
J C DeVoy, Trustee	347	500	125 00
J C DeVoy, Trustee	348	300	75 00
J C DeVoy, Trustee	349	500	125 00
J C DeVoy, Trustee	350	300	75 00
J C DeVoy, Trustee	351	500	125 00
J C DeVoy, Trustee	352	500	125 00
J C DeVoy, Trustee	353	500	125 00
J C DeVoy, Trustee	354	500	125 00
J C DeVoy, Trustee	355	500	125 00
J C DeVoy, Trustee	356	500	125 00
Elizabeth T DeVoy	357	300	75 00
J C DeVoy, Trustes	358	500	125 00
Elizabeth T DeVoy	359	300	75 00
J C DeVoy, Trustee	360	500	125 00
Elizabeth T DeVoy	361	300	75 00
Elizabeth T DeVoy	362	300	75 00
Elizabeth T DeVoy	363	300	75 00
Elizabeth T DeVoy	364	300	75 00
John C DeVoy, Trustee	365	300	75 00
John C DeVoy, Trustee	366	300	75 00
John C DeVoy, Trustee	368	50	12 50
John C DeVoy, Trustee	369	50	12 50
John C DeVoy, Trustee	370	50	12 50
John C DeVoy, Trustee	371	50	12 50
John C DeVoy, Trustee	372	50	12 50
John C DeVoy, Trustee	373	50	12 50
John C DeVoy, Trustee	375	50	12 50
John C DeVoy, Trustee	376	50	12 50
John C DeVoy, Trustee	377	50	12 50
John C DeVoy, Trustee	378	50	12 50
John C DeVoy, Trustee	380	50	12 50
John C DeVoy, Trustee	381	50	12 50
John C DeVoy, Trustee	382	50	12 50
John C DeVoy, Trustee	383	50	12 50
John C DeVoy, Trustee	386	50	12 50
John C DeVoy, Trustee	387	50	12 50
John C DeVoy, Trustee	388	50	12 50
John C DeVoy, Trustee	389	50	12 50
John C DeVoy, Trustes	390	50	12 50
J C DeVoy	401	50	12 50
J C DeVoy	403	50	12 50
Elizabeth DeVoy	441	100	25 00
Elizabeth DeVoy	442	100	25 00
J C DeVoy, Trustee	443	100	25 00
J C DeVoy, Trustee	444	100	25 00
J C DeVoy, Trustee	482	100	25 00
J C DeVoy, Trustee	484	100	25 00
J C DeVoy, Trustee	486	100	25 00
J C DeVoy, Trustee	488	100	25 00
J C DeVoy, Trustee	490	1000	250 00
J C DeVoy, Trustee	495	50	12 50
J C DeVoy, Trustee	496	50	12 50
J C DeVoy, Trustee	497	50	12 50
J C DeVoy, Trustee	498	50	12 50
J C DeVoy, Trustee	499	50	12 50
J C DeVoy, Trustes	500	50	12 50
J C DeVoy, Trustee	501	100	25 00
J C DeVoy, Trustee	502	100	25 00
J C DeVoy, Trustee	503	100	25 00
J C DeVoy, Trustee	504	100	25 00
J C DeVoy, Trustee	505	100	25 00
J C DeVoy, Trustee	506	100	25 00
J C DeVoy, Trustee	507	100	25 00
J C DeVoy, Trustee	508	100	25 00
J C DeVoy, Trustee	509	100	25 00
J C DeVoy, Trustee	510	100	25 00
J C DeVoy, Trustee	511	100	25 00
J C DeVoy, Trustee	512	100	25 00
J C DeVoy, Trustee	513	100	25 00
J C DeVoy, Trustee	514	100	25 00
J C DeVoy, Trustee	515	100	25 00
J C DeVoy, Trustee	516	100	25 00
J C DeVoy, Trustee	517	100	25 00
J C DeVoy, Trustee	518	50	12 50
J C DeVoy, Trustee	519	100	25 00
J C DeVoy, Trustes	520	50	12 50
J C DeVoy, Trustee	521	50	12 50
J C DeVoy, Trustee	522	50	12 50
J C DeVoy, Trustee	523	50	12 50
J C DeVoy, Trustee	524	125	31 25
J C DeVoy, Trustee	527	125	31 25
J D Barry	600	100	25 00
J H Carey	695	250	62 50
J H Carey	722	1850	462 50
J D Barry	725	3000	750 00
John Rostron	724	400	100 00
J H Floto	392	300	75 00
F F DuRose	623	150	37 50
Jno H Floto	392	300	75 00
Laura A Tallmadgs	542	25	6 25
A Wm Meyers	715	306	75 00

And in accordance with law and an order of the Board of Directors made on the 2nd day of February, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, No. 26½ Kearny street, San Francisco, California, on Monday, the 29th day of March, 1880, at the hour of 10 o'clock A. M. of said day, together with costs of advertising and expenses of sale.

WM. B. LAKE, Secretary.

Office, 26½ Kearny street, San Francisco, California.

Consolidated Pacific Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Bodie Mining District, Bodie, Mono County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Thirteenth day of March, 1880, an assessment (No. 1), of One Dollar per share was levied upon the capital stock of the corporation, payable immediately in lawful money of the United States, to the Secretary, at the office of the Company, 330 Pine St., room 5, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Sixteenth day of April, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the Eighth day of May, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. F. E. LUTY, Secretary.

Office—No. 330 Pine street, room 5, San Francisco, Cal.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Eighth day of March, 1880, an assessment (No. 41) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twelfth day of April, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the Third day of May, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) levied on the 14th day of January, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
J R Robbins, Trustee	17	68	6 80
J R Robbins, Trustes	61	1000	100 00
J G Whitney, Trustee	30	1000	100 00
A Hinds	57	1000	100 00
A Hinds	58	1107	110 70
J K Cooper, Trustee	109	100	10 00
T L Bibbins, Trustee	99	100	10 00
T L Bibbins, Trustee	100	100	10 00
T L Bibbins, Trustee	101	100	10 00
T L Bibbins, Trustee	103	50	5 00
T L Bibbins, Trustee	133	1000	100 00
T L Bibbins, Trustee	134	1000	100 00
T L Bibbins, Trustee	136	1000	100 00
T L Bibbins, Trustee	142	450	45 00
T L Bibbins, Trustee	146	100	10 00
T L Bibbins, Trustee	147	50	5 00
T L Bibbins, Trustee	148	50	5 00
T L Bibbins, Trustee	150	500	50 00
T L Bibbins, Trustee	157	100	10 00
T L Bibbins, Trustee	162	100	10 00
T L Bibbins, Trustee	163	100	10 00
T L Bibbins, Trustee	160	500	50 00
T L Bibbins, Trustee	170	500	50 00
T L Bibbins, Trustee	176	50	5 00
T L Bibbins, Trustee	185	100	10 00
T L Bibbins, Trustes	213	100	10 00
T L Bibbins, Trustee	216	500	50 00
T L Bibbins, Trustee	217	500	50 00
T L Bibbins, Trustee	218	500	50 00
T L Bibbins, Trustee	210	3000	300 00
T L Bibbins, Trustee	228	100	10 00
T L Bibbins, Trustee	220	100	10 00
T L Bibbins, Trustee	231	100	10 00
T L Bibbins, Trustee	235	500	50 00
T L Bibbins, Trustee	254	20	2 00
T L Bibbins, Trustes	269	100	10 00
T L Bibbins, Trustee	273	50	5 00
T L Bibbins, Trustee	293	1000	100 00
T L Bibbins, Trustes	378	97	9 70
T L Bibbins, Trustee	333	150	15 00
T L Bibbins, Trustes	393	50	5 00
T L Bibbins, Trustee	425	100	10 00
T L Bibbins, Trustee	426	100	10 00
T L Bibbins, Trustee	427	100	10 00
T L Bibbins, Trustee	428	100	10 00
T L Bibbins, Trustee	429	100	10 00
T L Bibbins, Trustee	430	100	10 00
T L Bibbins, Trustee	431	100	10 00
T L Bibbins, Trustee	436	1000	100 00
J Colman, Trustes	354	100	10 00
M French, Trustes	340	1000	100 00
H R Taylor, Trustee	349	50	5 00
Jos F Nounnan, Trustes	361	100	10 00
Jos F Nounnan, Trustso	366	100	10 00
J Griswold, Trustee	441	6000	690 00
Unknown	247	30	3 00
Unknown	249	8	80
Unknown	251	65	6 50
Unknewn	253	30	3 00
Unknown	255	30	3 00
Unknown	259	42	4 20
W Townsend, Trustee	410	1000	100 00
W Townsend, Trustes	411	500	50 00
W Townsend, Trustss	412	500	50 00
J M Hinkle, Trustee	369	1700	170 00
T A Wright, Trustee	294	1000	100 00
T A Wright, Trustee	370	300	30 00
T A Wright, Trustee	307	26	2 60
T A Wright, Trustee	309	1000	100 00
J R Robbins	357	20	2 00
C L Waters, Trustes	419	200	20 00
W J Cwynn	402	1000	100 00
Ceo O McMullin, Trustee	421	500	50 00
M K Lauden, Trustee	287	250	25 00
M K Lauden, Trustes	288	250	25 00
M K Lauden, Trustee	300	1000	100 00
M K Lauden, Trustee	301	1000	100 00
M K Lauden, Trustee	392	1000	100 00
M K Lauden, Trustee	303	1000	100 00
M K Lauden, Trustes	394	1000	100 00
E A Richardson, Trustee	315	500	50 00
E A Richardson, Trustee	316	500	50 00
E A Richardson, Trustee	317	500	50 00
E A Richardson, Trustee	318	500	50 00
E A Richardson, Trustee	319	500	50 00
E A Richardson, Trustee	320	500	50 00
E A Richardson, Trustee	321	500	50 00
E A Richardson, Trustee	322	500	50 00
E A Richardson, Trustee	323	500	50 00
E A Richardson, Trustee	324	500	50 00
E A Richardson, Trustee	325	500	50 00
E A Richardson, Trustee	326	500	50 00
E A Richardson, Trustee	327	500	50 00
E A Richardson, Trustee	328	500	50 00
E A Richardson, Trustee	329	500	50 00
E A Richardson, Trustee	330	500	50 00
A H Todd & Co., Trustee	418	200	20 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 314 Bush street, San Francisco, on Thursday, the 11th day of March, 1880, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

T. L. BIBBINS, Secretary.

Office—314 Bush street, San Francisco, California.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Thursday, the 25th day of March, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, room 37, San Francisco,

March 15th, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 53) of Thirty Cents per share was declared, payable on Saturday, March 20th, 1880. Transfer books closed until the 22d inst.

P. JACOBUS, Ass't Secretary.

DIVIDEND NOTICE.

Office of the

BLACK BEAR QUARTZ MINING CO.,

Room 13, Safe Deposit Building, San Francisco,

March 15th, 1880.

A dividend (No. 7), of twenty-five (25) cents per share was declared on the capital stock of the Black Bear Quartz Mining Company, payable immediately.

WM. LETTS OLIVER,

Secretary.

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GRAY & HAVEN,

Attorneys and Counsellers-at-Law,

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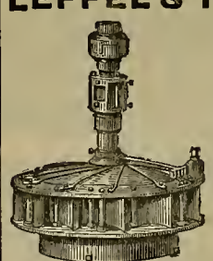

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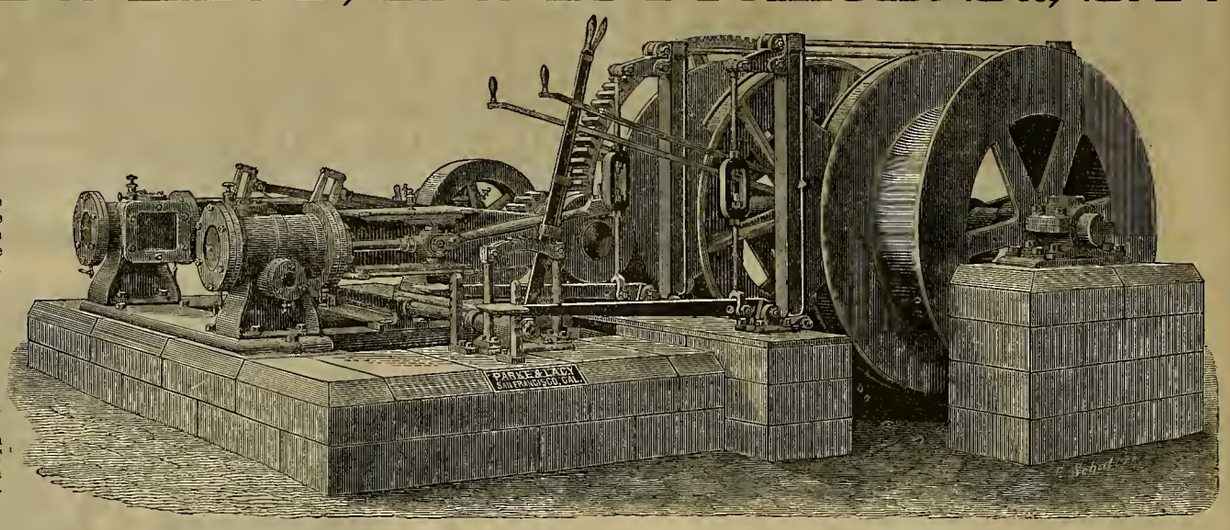

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SAN FRANCISCO, SATURDAY, MARCH 27, 1880.

VOLUME XL. Number 13.

Congress and the Chinese Question.

The President has sent to the Senate three nominations, as follows: James B. Angel, of Michigan, to be Envoy Extraordinary and Minister Plenipotentiary to China, vice George T. Seward, recalled, and John F. Swift, of California, and Wm. H. Wescott, of South Carolina, to be Commissioners to China to negotiate a treaty with that empire.

The appointment of this commission is a very important matter to the interests of California. The *Call's* Washington correspondent has interviewed the members of the Pacific coast delegation to obtain their views on this new movement.

Senator Booth and Representative Horace Davis agree in saying that although this plan is contrary to their advice and wishes, and that while they would have vastly preferred the appointment of Mr. Swift as Minister, or, failing in that, would have desired to have the negotiations entrusted to him as the sole Commissioner, they nevertheless consider it a substantial gain to have the work placed in his charge in conjunction with another Commissioner, rather than have it entrusted to any Eastern Minister, or to an Eastern Commissioner alone. They also understand that these Commissioners are to be sent out with positive instructions to accomplish the object of restricting Chinese immigration to this country. At the same time they purpose continuing their efforts to procure the enactment of the fifteen-passenger bill by Congress.

Representative Page is unequivocally opposed to the commission as constituted by President Hayes. He remarks that, of course, nothing can be accomplished through negotiations, unless the diplomatic representatives of our government and the Peking authorities arrive at an agreement; and this, he says, cannot possibly be expected, for the Chinese government and Eastern Minister and Eastern commission will be certain to range themselves on one side, while Swift will stand alone on the other. "If," says Mr. Page, "the President and Secretary Evarts are acting in good faith, they should appoint a minister who represents a principle opposite to that represented by the Chinese government, and send him to Peking with instructions to insist upon a modification of the treaty to restrict Mongolian immigration. If positive instructions of this sort are to be given, one commissioner is as good as two or a dozen commissioners."

Congressman Pacheco says that as a direct proposition he has been opposed to it; but as it has been done, it must be accepted, as something is much better for the administration to do than to do nothing. He regards it as a step forward, which will result in advantage to the anti-Chinese movement by attracting Eastern attention to the importance of the subject, if no other way.

Congressman Berry does not believe that the new plan will amount to anything. The Eastern commercial and so-called humanitarian influences will be sufficient to produce a decision of opinion in the commission in regard to the question of immigration, and China, being unwilling to yield the advantages she now enjoys under the one sided Burlingame treaty, will readily take advantage of this division to prevent anything being accomplished. Moreover, he believes the Eastern Minister will exert his influence against us on this question.

Representative Daggett regards this movement simply as an effort to take the Chinese question out of politics. Mr. Daggett also believes that under this proposed commission plan the Chinese could, and would, consume three or four years of time in negotiations.

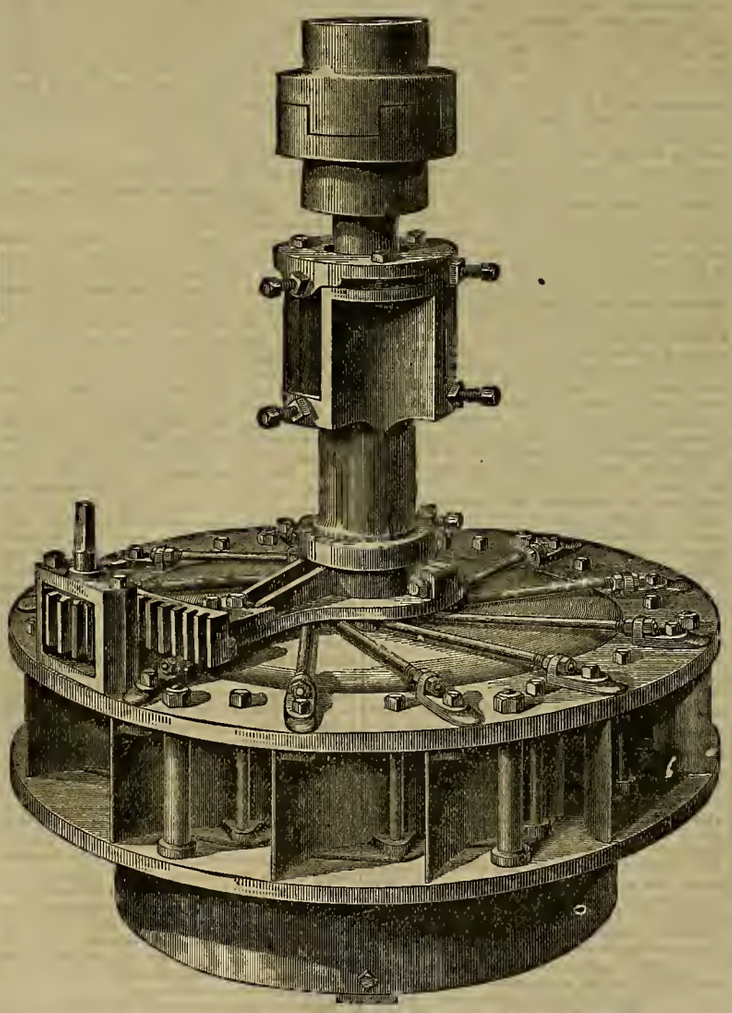
Congressman Whittaker also regards this commission idea as a device to remove the Chinese question from politics and allay its agitation for the time being.

Senator Farley says the proposition is a departure from all usage and custom. A Minister appointed from the Pacific coast might have accomplished something; but a California Commissioner, who, in all probability, will find himself handicapped at every turn, cannot be expected, under such circumstances, to accomplish anything.

Senator Jones, of Nevada, denounces the whole plan as a humbug, and a cowardly scheme to take the Chinese question out of politics and away from Congress. He considers it mere shuffling and evasion on the part of Hayes and Evarts.

The Leffel Double Turbine.

We give on this page an engraving representing the general appearance of the Leffel double turbine wheel, as completed and ready for attachment of shaft above it. This wheel is a thoroughly tested hydraulic motor, proven by practical tests to secure the greatest economy of water, together with the greatest degree of durability. The various working parts of the wheel have been improved, through greater accuracy in their formation, and increased durability of material. The facilities for perfected manufacture of the entire wheel have also been increased from time to time. Notably has this occurred during the past year, when new, extensive and convenient works have been built for the construction of these wheels.



IMPROVED LEFFEL DOUBLE TURBINE WATER WHEEL.

Among the most noticeable modifications and additions made (some of which are patented), are the improved link for operating the gates; the process for lining the iron plates with brass or any anti-corrosive metal (applied only when specially ordered); the combination of the toothed segment with the gate-arm in such a manner that the segment can be removed when the teeth become worn, and a new one supplied; the spherical iron penstock; the use of steel gates or guides for some sizes, instead of iron; and the improved method of casting solidly in one piece both wheels, by means of which the edge of the diaphragm can be made much thinner, and yet stronger, assisting also to separate more perfectly the due proportion of water to each wheel. Half the buckets being made of good boiler iron, and the fillets retaining them been improved, both in form and strength, it is impossible to break or tear out any of them; as a result of which, out of the last 5,000 wheels put in operation, not one has lost a single bucket.

The Leffel double turbine is constructed and acts upon principles, which are peculiarly characteristic of it as a water wheel, and upon which its reputation has, to a great extent, been established. There is in it a combination of two independent sets and kinds of buckets, one a vertical, the other a central discharge, each entirely different in its principle of action upon the water, yet each wheel or series of buckets receiving its water from the same set of guides at the same time; but the water is acted upon but once, since half the water admitted by the guides passes to one wheel, and the other half of the water to the other wheel, the water leaving both wheels or sets of buckets at the same time and as quickly as possible. These two sets of buckets are so combined as to make really but one wheel; that is both are cast in one piece and placed upon the same shaft. By this arrangement there is admitted the greatest possible volume of water, consistent with its economical use, to a wheel of any given size, and at the same time the greatest area for the escape of water is secured. The surface in the wheel is thus reduced to minimum as compared with the quantity of water used, avoiding a very material loss by friction, which otherwise seriously diminishes the working power of a wheel. The value of this arrangement will be fully appreciated by those who understand the practical effect of the frictional surface in a water wheel. Messrs. Parke & Lacy Nos. 21 and 23 Fremont street, San Francisco, are now agents for the James Leffel water wheels on this coast.

The Mines and Mining Industries of Utah.

From an intelligent and careful observer who has just returned from a trip to Utah, made partially in the interests of this journal, we obtain the following information in regard to the history and present condition of mining in that Territory. This industry, as is well known, was at the outset forced to encounter in Utah many obstacles, some of them being of a peculiar and exceptional kind. In the first place, the ruling powers in the Mormon church exerted themselves to deter their followers from engaging in the business, as well as to interpose hindrances in the way of others who sought to do so, a policy that tended to retard mining long after the great mineral wealth of the country had become a well established fact. When, after the lapse of several years, this pursuit had got well on its feet, and was beginning to attract capital to its aid, it met with a sharp set-back through the failure of the Emma, the Flagstaff, and several other large companies, mostly English, who, having in the first place paid excessive prices for their properties, afterwards administered them with as little business sense as they had manifested in their purchase. These disasters dealt a staggering, and what was at the time by many thought to be a fatal blow to mining in Utah. Alarmed by these signal failures, business men became cautious, merchants restricted their credits, and capitalists avoided the country, over which a dark cloud for the time being seemed to settle. But, as often happens, these misfortunes proved to be blessings in disguise. Thrown upon their own resources, locators had no alternative but to go to work and open their claims with their own labor, subsisting and defraying current expenses with the proceeds of such small lots of ore as they were able to get out while carrying on the work of exploration. The result of this has been that the mines of Utah are to-day more generally developed than those of any other country in the west except California, these properties remaining meantime almost wholly in the hands of the original owners, who are, as a class, in pretty good financial circumstances.

While the mines in this Territory are generally so well exploited, it is the case, too, that they are well distributed over the country, there being one or two and sometimes as many as a dozen or more really good properties in almost every mining district. For the most part, these districts are of easy approach, several of the more central being already connected with Salt Lake city by railroads, for the construction of which the topography of the country is highly favorable. In the course of a few years, every important mining locality in the Territory will in like manner be put in communication with Salt Lake city, and, through the Utah Central railroad, extending thence north to Ogden Junction, with the great transcontinental thoroughfares which meet at that place.

With these facilities for effecting cheap transportation and promoting intercourse with the outside world, the business of mining for the precious metals can hardly fail to make rapid progress in Utah for some years to come.

A more full account of mining operations, with some notices of the more prominent mines in that Territory, will meet with early publication in the PRESS.

THE "Council of 200" have nominated as freeholders for the coming election, 15 prominent citizens, composed equally of Democrats, Republicans and Independents.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

An Insane Land Commission.

EDITORS PRESS:—I bave read with surprise and indiguation a telegraphic outline of the recommendation which the Public Land Commission make to Congress relative to the locating of mineral lands. The changes proposed are so sweeping in tbeir nature that it behooves mining men to see that they are fully considered in all their hearings, before being permitted to go upon the statute hooks. The commission advises Cougress to enact a law which will reqnire a prospector to he in possession of nearly a thousand dollars before he can explore the public lands or locate a single lode. After setting his stakes and discovering mineral, the miner must, within ninety days, go, perhaps one to two hundred miles, and file copies of his location notices at a land office, and pay $50 to the United States. A survey will then be ordered, and, before a year from the date of location expires, he must apply for a patent, and prove that he has done work of the value of $500 upon the claim, or all his rights are forfeited. Now, the fact is notorious to every person who has lived in or visited our mining States and Territories, that mining districts are discovered and new mines taken up hy men who, in nine cases out of ten, have not $5, in money or credit, at their command. The prospector is usually an enterprising, fearless fellow, who goes out into the wilds of a new country, and, for the public good generally, more than for his own, finds and locates mineral lodes or claims. To requiro such a man to do what the commission proposes, is simply to put him out of the field as a prospector, unless he can get a capitalist to "grub-stake" him, and probably also "freeze" him out of his remaining interest.

The proposed change is uuwise: 1st. Because its adoption would confer no benefit on the country, or on the mining community, or, indeed, on any one save a few officials in the land offices. 2d. Because it would practically put an end to all mineral explorations in new countries by poor men; and 3d. Because it is emphatically and unequivocally a deep-laid scheme in the interests of monopolists having a command of money.

Heretofore there has heen remarkable liberality shown by our Government towards the mining explorer, and it is mainly owing to this that our mineral wealth has heen laid open before the eyes of the world.

The discoverers of the Comstock lode could not have complied with the requirements this sapient commission would like to saddle on the miners of the country in the locating of claims. Is the entire spirit of the Government towards miuing interests to be overturned, because a commission, that does uot know wbat it is doing, has succeeded for a brief moment to let its silly coousels he heard above the clang of prosperous mining work? It is not in one tbing that the recommendations of the commission display the verdancy of its individual members. Our present mining law has been working well for years, and wbere its requirements are obscrved in the locating of mines, there cannot be any opportunity given to blackmailers to cloud titlcs acquired under it. The trouble is, that there is not one location in twenty that is strictly made in accordance witb the law. Is that evil—proceeding from the lack of education and business training on the part of prospectors—to be done away with hy a wholesale overthrow of the prospecting class, unless they are fortunate enough to he possessed of a given amount of ready money? The commission recommends the passage of a law requiriug mining locations to be made with

Vertical Lines

Going downwards into the earth, no matter how the lode outcropping within the claim may pitch—steep or flat. It ought to be a cause of deep mystification to the members of the commission to perceive that the Creator did not foresee their appearance at this stage of the world's history, and anticipate their wishes by making every lode assume a truly vertical position.

It is a perversion of the truth for the commission to assert that the majority of miners in the Western States and Territories are in favor of square locations and the abolition of local customs and regulations in respect to the locating and holding of mines.

The Leadville prospectors who were unsuccessful in getting a share of the flat beds of ore discovered there, have no doubt felt that the law of 1872 was the principal harrier in their way to desiderated fortune. But since a lode is a lode, whether it is vertical, inclined or flat, there is no use in wasting time or words as to rights justly acquired uuder existiug laws. If the early locators of the Leadville ore beds have beon unusually fortunate, that is no reason why a hare-hrained commission should deprive a whole army of prospectors of the right, or power, to explore vacant mineral lands. Here is one member of the commission who has proved on the witness stand in courts of justice that he is very far from heing infallihle. I refer to Clarence King, who, as a paid expert for the Richmond Con. mining company, testified, on one occasion, that the Richmond lode was a true fissure vein. A few years later he appeared for the same company in another snit, and, as his testimony was then required in a different direction, he swore as solemnly as he had done years before to an opposite theory—that the Richmond lode was nothing hut a "pipe vein." On being confronted with a printed copy of his first testimony, he admitted that he had been mistaken on that occasion; that in fact he did not know much of the subject he was called upon to elncidate. If this fallible commissioner could blunder so egregiously when he was testifying under oath, is there any certainty that he is infallihle now when he is leading a band of reckless spirits, whose object is to expel mining prospectors from tbe United States? The expulsion, I am very eure, will not be so easily effected as the commission imagines.

In respect to square locations, it is folly to overlook the fact that every mine on the Pacific coast, of any note in deep mining, is heing worked ontside of such vertical lines as would have been estahlished if the law proposed by the commission had heen in force at the time of its discovery. The Comstock and Eureka mines now heing explored over 1,000 feet from the surface outcrop, afford incontestable evidence of the absurd principle of vertical side lines in locating.

If the law of 1872 must he changed to please grasping people, who have the communistic idea that, when things are broken, some good must come hy the change, why not make tbe side lines of a mining claim go down into the earth corresponding to the apparent inclination of the lode itself? Suppose a locator decides within three months after discovering a lode, that it goes downwards at an angle of 50°, give him the right tben to side lines with a like inclination, and keep intruders from crossing such lines either on the surface or underground. The only risk in that case will come from the lode bearing in an opposite direction to that shown on the top, hut a good prospector ought to discover tbis before he fixes his lines.

The commission bolieves it is saying something wonderfully "smart," when it speaks of the law of May, 1872, as "an act to cause the Government to join with an unknown second party, to convey to a third party an illusory title to an indefinite thing, and encourage the subsequent robbery thereof." This assertion, as applied to the law in question and to its effects on mining titles, is willfully and slanderously untrue. The words hear witness, themselves, that they were written hy the Rev. Edward Probert, managing director of the Richmond Con. company at Eureka, Nevada, and sent to his bumble servant, Clarence King, to be inserted by him for effect's sake in the report of the commission. The numerous law suits of the Richmond company were not due in a single instauce to anything connected with, or influonced hy, the mining law of 1872. The Rev. Probert aforesaid, with his Englisb hull-headedness and defiant neglect of law, justice and the rights of neighboring mine owners, was the chief cause of at least one of these suits, and being justly defeated, it is too late now to have revenge on all the miners of America, through Clarence King's help, hecause he could not sway United States Judges according to his will.

I have no more to say for the present, bnt may revert to the subject in another letter. I trust that the outrageous recommendation of a weak, worthless commission will be quickly disposed of by the good sense of our practical miners. They need, however, to discuss the whole snbject through tbe local newspapers.

J. D. EMERSLEY.

Dos Cabezas, Arizona, March 9, 1880.

Oreana and its Vicinity.

EDITORS PRESS:—Your repertoire of mining news has not had views of Humboldt county, Nev. Perhaps the county is to blame—the rocks and rills can hardly be. Trinity, an extinct district, lies west from Oreana and northwest from Lovelock, 10 miles from each. The canyon seems to have heen showered with drops when Mides sprinkled his yellow garden. The mines are narrow, compared to the Comstock, hut they are rich in silver and gold, and Comstock cannot deny the "blood." The Rye Patch, Alpha, Numa and other prominent mines, not excluding the Paradise lodes, that have lined pockets and added to our vocahulary, have none of them sought for ores at any depth; "blocks" of noble metal are found when songht for helow the water level, when the indications are favorable on top. Ores that produce $1,000 and $2,000 per ton are worth seeking, at some cost. Trinity is filled with such veins, and dollars have been coined from its yield that hundreds of thonsands are needed to tell of. Some capital, a good deal of economy and average brains, will make a new town where old Rome died from too many Antonys and Cleopatras. The Arabia district sent her half million and only made a hole on top of ground. Limerick, in the Star Peak range, has some faithful miners that will win success. Hope and Bennett and Bush have made some hard studies in geology, and the prospects are they will meet with reward. The whole county seems covered by a dream; cannot the PRESS awaken it? Undeveloped wealtb is here near the surface. Bad management and morals and non-residence have been the cause of its past misfortune. Lovelock is a town that boasts of everything (but harmony), on an agricultural basis, when it should vie with Oreana as a mill, whistle-blowing town.

R. S. D.

New Mining Fields on Upper Joaquin and King's Rivers.

EDITORS PRESS:—Your issue of March 13th very aptly calls the increased interest for the past year in mines, prospecting for same and results, as a "mining boom." To no State could this term be more truly applied last year than to California, and to no portion of it more than to the lower and higher Sierras along tbe San Joaquin, Fresno river, King's river, the Kaweah, and their tributaries. Letters and cullings from various sources informed your readers last summer and fall quite fully of the lively prospecting and developments in the Fresno Flats, Lake, North Fork, Minaret, Laurel and Prescott districts, in Fresno and Mono counties. In conversations about snch matters, the question has been frequently asked, "Has any late prospecting heen done along the South Fork of the Sin Joaquin river, in all that comparatively unexplored mountain region of Fresno county?" Only of late have we been able to get an answer to this question.

Impelled by Valuable Discoveries

In several new mining regions in the summer of 1878, as well as hy light crops and dull business, numerous farmers and others from Fresno county, in the Dry Creek region and around Fresno City, determined to do some thorough prospecting in the very high, rough and inhospitable country along the South Fork of the San Joaquin, especially around the sides of Mt. Goddard. The result was that about fifty prospectors visited that region last summer, did much laborious and careful prospecting—so long as the weather in those high altitudes permitted—located at least a hundred claims on more or less promising quartz ledges, and organized what is now known as

Fresno Mining District.

Among these prospectors were John Doak, the three Collins brothers, two Wyatt brothers, Messrs. Wackford, Garrison, Wainscott, Field, Tadlock, Winchell and Faber. The legal extent of this new district is about 12 hy 18 miles. This wild and literally trackless—mostly trailless—part of the Sierra Nevada, is very difficult of access. For the following items of the route taken by these pioneer prospectors of the silver and gold-bearing ledges of

Mt. Goddard, Mt. Humphreys, the Palleidee, And their vicinity, and for results, your correspondent is indebted to Mr. Doak, Mr. Collins, Mr. Faber, and others:

Their route from Big Dry Creek P. O. was via the Toll House, 18 miles, thence to Donaboe's mill, 10 miles, and to Stevenson's creek, 7 miles. Here families of men who drive their sheep to the mountains for summer pasturage, often spend the summer. Thence, they went 23 miles to Dinkey lakes, the source of Dinkey creek, a tributary of King's river. From there tbey went across a low divide, 6 miles to the head-waters of Big creek, a tributary of the San Joaquin; thence to a large lake, 5 miles distant. From this point they followed the creek down to the main San Joaqnin, 5 miles, to Blaney's Camp, a place well known to "sheep men." This is described to me as some tbree miles below where the South Fork enters the main river. From Blaney's Camp they went up the main San Joaquin about three miles, and, recrossing to the south and west side, followed up the South Fork on its east side some six miles. Here they crossed hack to the west side, and traveling about eigbt miles southwest, found themselves under the towering peaks of

Mt. Goddard,

And, as shown hy an aneroid barometer in the party, at an altitude of 12,500 feet. Here they found the huge outcroppings of numerons mineral-hearing quartz ledges, of which we shall presently give a brief description. These outcroppings are immediately at the hase of the precipitous and rugged peaks of Mt. Goddard, which, as they fouud, consists of hlack slate. Some of tbe younger and stouter men of the party attempted the difficult ascent of this high, abrupt peak, and one or two succeeded in reaching its giddy top, while others were forced to stop from nose-bleeding, difficulty of breathing and exhaustion, hecause of the extreme rarity of the atmosphere. They estimated the top of this peak to he hetween 1,200 and 2,000 feet higher than tbe quartz outcroppings abovenamed, a close correspondence with the measurement of our geological survey. Near the outcroppings of these mineral ledges (12,500 feet altitude) which they located, are two small lakes a quarter of a mile apart.

These are the sources of the South Fork of the San Joaquin lying on the northwestern slopes of Mt. Goddard, at a point, as well as they could make out, some 10 miles due west of a red peak on the summit, where they found numerous other mineral ledges, and which, almost beyond douht, is

Mt. Humphreys.

The latter hy close examination they found to he composed of slate, porphyry and red lava, evidently the cone and crater of a volcano long since extinct. Immediately west of Mt. Goddard they found a high ridge of granite surmounted hy three peaks, forming altogether an almost impassible barrier in that direction. Upon its southwestern slope, are some of the sources of the Middle Fork of King's river.

The aforementioned outcroppings of quartz on the northern slopes of Mt. Goddard, they discovered are divided into three mineral-bearing ledges which have every indication of being true fissure veins. They extend almost due north 2½ miles to the banks of the South Fork of the San Joaquin, descending in that distance from a hight of 12,500 to about 9,500 feet. The general color of the ore is purplish gray, and assays show it contains chiefly copper and silver. One regular assay gave per ton $56 copper, $40 silver and $12 gold. Cap rock near Mt. Humphreys, extending for two miles, yielded from $3 to $5 gold. Mr. Faher also gave me the results of an assay of similar ore from a ledge he found on the South Fork 7 miles below Mt. Goddard, as follows: ¼ copper of finest quality, $67 silver and $2 gold per ton. There are said to he at least seven true fissure veins on Mts. Goddard and Humphreys.

The greatest depth of any of this prospecting was six feet. The entire region in question is not yet more than half prospected. In fact, it is very difficult to prospect there.

Timber is Generally Scarce—

In strong contrast to the heavily timbered districts along the main San Joaquin and its North Fork, as described in your columns by my letters last fall. Much of the country in the Mt. Goddard district is bare, showing only rocks, snow and water. In many localities you must pack wood for camp-fires. Yet for the "Fresno Mining District" a good mill-site has already heen located, on the South Fork at an altitude of 9,500 feet, where the three ledges described descend from Mt. Goddard. Here they have sufficient timber for mining purposes for a short time. But for heavy timber tbey must go 12 miles to the main San Joaquin. It is an odd and interesting fact, that this mill-site has the same altitude as Mammoth mill and Highland City.

Iron Ore of the Best Quality

Is found in considerable deposits in this locality along the South Fork. In fact, in the foothills hut 12 miles east of Big Dry Creek P. O., there is a fine ledge of chrome iron 15 feet wide, which is said to be 44% in purity. The parties above mentioned propose to prospect and develop their extensive claims more fully this summer. They expect to hegin a tunnel 1,000 feet in length, and 2,000 feet helow the outcroppings, with which they design cutting three ledges, hoping to strike a test ledge wheu the tuunel is in 100 feet.

Indeed, so soon as the snow disappears sufficiently, the vast mountain regions along the upper San Joaquin and King's river, with their numerous branches, will swarm to an uuusual degree with old and new prospectors, for huudreds who, a few years since, gave up mining on the Pacific coast for farming and other pursuits, are now from the disappointments as well as from the alluring hopes of life, returning to their first love—the miner's toilsome, rough, adventurous and intensely exciting craft.

J. W. A. WRIGHT.

Hanford, March 15tb.

A Test for Nickel.

EDITORS PRESS:—Among my excerpts from your paper I find the following nickel test: "Zanthogenate of potassium in aqueous solution gives, with a trace of nickel, an intense yellow color. If more nickel is present, a yellow precipitate which does not disappear on addition of ammonia. Copper gives a similar yellow precipitate which disappears on addition of ammonia."

A young metallurgist of my acquaintance, Mr. George F. Beardsley, has tested this test with the following results, which I witnessed: The test for nickel is quite delicate, hut the facts are reversed in that it is the nickel precipitato which disappears (dissolves) in ammonia, while that from copper does not.

Cohalt gives with the zanthogenate of potassium a greenish yellow precipitate, insoluhlo in ammonia. The color is hest scen by reflected light. Zinc gives a white precipitate, soluble in ammonia.

Nickel and copper together in solution are distinguished hy treating the mixed precipitate with ammonia; the nickel dissolves and is separated from the copper by filtration. The filtrate is then neutralized with acetic acid, when tbe yellow precipitate of nickel again appears.

Zanthogenate of potassium is made hy adding hisulphide of carbon to a solution of caustic potash in alcohol. It crystallizes in colorless, silky needles. Ethylsulphocarhonate = $KC^3H^5OS^2$.

C. H. A.

THE ELECTRIC LIGHT IN COAL MINES.—In view of the fatal colliery explosions which are continually occurring, it is surprising that some adaptation of the electric light has not heen tried underground. It is questionable whether any of the so-called safety-lamps are quite safe under all circumstances in a fiery mine; at any rate, it is well ascertained that the men are in the habit of opening them, and some of the most destructive of recent explosions have heen traced to this cause. It is true that the hest arrangement for electric lighting is very far from perfection; hut, however crude, it is nevertheless employed in lighting thoroughfares and factories in many places successfully, and at a comparatively moderate outlay. Between the effulgence of the electric light at the bottom of a colliery, and the glimmer of the Geordie or the Clancy, there can he no comparison, the cost of the application would not he great, and it would give absolute safety to the miner, so long at least as he kept from etriking matches.

MECHANICAL PROGRESS.

The Fly-Wheel.

If we examine the rotative effect of the pressure on the crank-pin of a steam-engine, we find that at the beginning and termination of the stroke, this pressure, whatever its amount, has no useful effect. On the contary, it may readily be seen to result in a doubled loss, being, in this respect, accountable for a considerable percentage of the total friction of the engine. Theoretically, this condition, a lack of useful effect, exists at but two points in an entire revolution; practically, and because of friction, it exists for an appreciable time and through considerable space. This is really a serious defect in the reciprocal engine, but one for which there seems to be no remedy, since other forms of construction entail more serious losses in some other directions. If the pressure on the piston was constant, and there was no friction, the rotative effect of that pressure, starting from zero at the beginning of the stroke, would increase up to about mid-stroke, where it would be at its maximum; and from which point it would as gradually decrease to the end of the stroke, where it would again be at zero. Practically the same conditions would exist during the return stroke, completing the revolution of the shaft; while somewhere between zero, or no effect, and the maximum effect, would be the mean effect, representing the resistance against which the piston was moving, translated into the rotary motion of the shaft. Since the maximum effect is above the mean effect, it follows that it will tend to accelerate the motion of the shaft; while at another time, the effect being at zero and below the mean effect, the resistance to the turning of the shaft, due to the power transmitted, would in a like manner retard its motion, so that the shaft would be moving at different velocities at different times in its revolution; and, whatever the corrective means employed to neutralize this tendency, this is exactly the way it does move. The ordinary duty of the fly-wheel is to bring about an *approximation* to equal, or uniform the turning of the shaft; and it does this by absorbing the excess of energy at one portion of the stroke, and giving out the energy thus absorbed at another portion. But it is plain the fly-wheel can not absorb energy without increasing its velocity, neither can it part with energy without losing some of its velocity. Hence, the popular belief that the crank-shaft of a well-constructed engine moves at a uniform velocity may at once be seen to be a popular delusion. The weight and velocity being the factors which determine the energy of the wheel, and the weight remaining constant, its energy can only be increased or decreased by increasing or decreasing its velocity.

But as the change in its velocity will be in the inverse ratio, which the energy added to or subtracted from bears to the normal energy, it follows that with a wheel infinitely large this change will be infinitely small, while with a wheel infinitely small the change will be correspondingly large; thus the motion will be very regular, very irregular, or anywhere intermediate according to the corrective energy of the fly-wheel. The problem is after deciding upon the amount of irregularity permissible, and the extent of the causes which produce this irregularity, or, rather, the total effect of these causes, to so proportion the wheel as to keep within the limit of irregularity fixed on. To this it is always advisable, and frequently imperative to add something to the weight for sudden fluctuations in load. As the variation in rotative effect, for a given mean effect, is due to causes which may vary, and generally do vary, from some peculiarities in construction; and since the *vis viva* of the fly-wheel varies as the square of its revolutions, it is manifest that, at the best, it can only be determined from a perfect knowledge of all the elements in the case, and so can not properly be referred to any one of them. Since, however, the practice towards greater uniformity of piston-speed, it would seem proper to proportion the diameter to the stroke of engine; when, as is the case to a great extent in this country, the fly-wheel is also the band-wheel, more uniformity in belt-speed would obtain. If, for instance, a diameter of four times the stroke was universal at the same piston-speed, the same belt-speed would result, regardless of what the stroke might be. The belt-face may then be one and one-half times the diameter of the cylinder for ordinary sizes, and the depth of rim will be from one and one-half to three and one-half, or even more, varying, of course, to suit different conditions. This will meet ordinary practice perhaps, as well as any simple suggestion; but the purchaser should bear in mind that a heavy fly-wheel means close regulation, or, at least, that he can not have good regulation without it.—*F. F. Hemenway, in Cincinnati Artisan.*

ELECTRO-MEASUREMENT OF THE HARDNESS OF STEEL.—An apparatus has been produced by Prof. Wattenbofen, of Prague, for measuring the hardness of steel electro-magnetically. Its principle is that hardness of steel may be very correctly inferred from a numerical determination of its coercive force. In its main features, his arrangement is as follows: From one end of a balance arm are suspended successively, in a brass bolder, bars of the steels to be examined —those being as nearly as possible equal in weight. The other arm bends obliquely downward, and bears a constant weight. Motion of the beam causes a pointer to move radially over a scale, the movement being magnified by toothed wheels. One of the steel bars having been suspended, a magnetizing coil, equal to it in length, is raised on a stand so as to inclose the bar, and fixed with a binding screw when it does. Then a current is sent through the coil; then the coil is released and moved gradually down, pulling the bar with it, till the latter breaks away, and the deflection of the pointer is noted at which this occurs. This affords an estimate of the hardness of the steel. For example, a bar, A, gives a maximum attraction, 9.6; a second bar, B, 15.5; a third, C, 14.6. It is inferred that A is considerably harder than B and C, and of the two latter, C is harder than B. Precautions are taken in the apparatus to prevent injury to the parts from the sudden recoil when the hold of the coil on the bar ceases.

THE WEIGHT OF CAST IRON.—The following letter is clipped from a late number of *Iron*, of London: "I shall be glad if any correspondent can inform me if there is any reason to suppose the weight of cast iron was greater 60 or 80 years ago, as manufactured then, than it is now, or not? The School of Naval Architecture at this time takes cast iron in its calculations as weighing 447 lbs. to the cubic foot, but I find in Sir Howard Douglas's work on Gunnery that the size of cannon balls about 1815 infers a greater specific gravity for them. Thus, as given in his work;

9 lb.	cannon ball was of	4.00	in. diameter.
18	" "	5.04	"
32	" "	6.11	"

Now the weight of spherical bodies is in proportion to the cube of their diameters, and calculating according to that rule I find the actual weight of these shot would be only 8.60 lbs., 17.22 lbs. and 30.70 lbs., or considerably less than their reputed weight, unless the castings were of greater specific gravity than is now reckoned. A difference of 1¼ lb. in a 32-lb. ball is of consequence, and could scarce arise from any mistake in so expert and learned an author as Sir Howard, who is precise to a fault."

A LOG RAILROAD.—A log tramway or railroad in use by the Richardson Bros., at their mill, south of Truckee, is a very ingenious piece of machinery. Logs, ten inches to a foot in diameter, are hewn round and smooth and their ends are coupled together by iron bands. These logs, laid side by side upon graded ground for a distance of perhaps three miles, form the track. Of course the road looks quite like an ordinary railroad track, except that logs are used instead of rails and the ties are at much greater intervals. The wheels of the engine and cars are concave on their outer surface, and fit the curve of the logs. The power is applied to a wheel in the middle of the forward axle on the engine. The most remarkable loads of logs are hauled upon the cars, and the affair is a decided success. It is very cheap, its construction is simple, it is not easily damaged, and its operation is all that could be desired. By means of this log railroad the Richardson Bros. are enabled to get their logs to the mill from the forest, three miles distant, at a cost far less than it is ordinarily done.—*Truckee Republican.*

DEADENING NOISES OF WORKSHOPS.—To those who carry on any operations requiring much hammering or pounding, the following, from the *Workshop Companion*, will be a great relief. 1. Rubber cushions under the legs of the work-bench. *Chamber's Journal* describes a factory where the hammering of 50 coppersmiths was scarcely audible in the room below, their benches having under each leg a rubber cushion. 2. Kegs of sand or sawdust applied in the same way. A few inches of sand or sawdust is first poured into each keg; on this is laid a board or block upon which the leg rests, and around the leg and block is ponred fine dry sand or sawdust. Not only all noise, but all vibration and shock are prevented; and an ordinary anvil, so mounted, may be used in a dwelling house without annoying the inhabitants. To amateurs, whose workshops are usually located in dwelling houses, this device affords a cheap and simple relief from a very great annoyance.

THE MARINE BICYCLE.—Quite a sensation was created on the river recently by the exhibition of what Mr. Urch, the inventor, calls the "marine bicycle." It is constructed after the catamaran style; the length of this one, which is built as an experiment only, is 25 feet; the two boats are each six inches wide and six inches in depth, and about three and a half feet apart, and held in position by wooden bars. In the center is placed the bicycle, and from it extends aft an iron rod eight feet long, to which is attached the propeller; this is between the boats, and the present power, which will be greatly improved, gives her speed enough to heat any dory on the river. The steering gear consists of a rudder on each boat, and the machine answers the helm quickly, considering its length. One good point is that it can be stopped almost instantly, when under full speed. It will probably be one of the most popular river amusements.—*Portsmouth Gazette.*

IT is claimed for a process patented by Chas. J. Evans, that blooms can be made from scrap iron by the use of one barrel of petroleum to the ton, equal in quantity to the best Swedish blooms, and at a total cost not exceeding $35 to the ton, or about one-quarter of the present price of the Swedish article.

SCIENTIFIC PROGRESS.

Transmitting Colors by Telegraph.

Dr. H. E. Licks, of Old South Bethehem, Pa., after three years' labor, claims that he has perfected an instrument by which forms and colors can be sent by wire the same as words are sent. He calls the instrument a diaphote. The word diapbote, from the Greek, *dia* signifying through and *photos* signifying light, has been selected as its name, implying that the light traveled through or along a wire. He read a paper on his invention before a scientific society.

The diaphote consists of four essential parts, the receiving mirror, the transmitting wires, a common galvanic battery and the reproducing speculum. The Doctor gave a detailed account of the many experiments undertaken to determine the proper composition and arrangement of the mirror and speculum. In the diapbote exhibited, the mirror was 6 inches by 4, and had 72 fine wires, which were gathered together in one about a foot back of the frame, the whole being finely wrapped with an insulated covering, and on reaching the receiving speculum each little wire was connected to a division similarly placed as in the mirror. From a common galvanic battery wires also ran to each diapbotic plate, and thus a circuit was formed which could be closed or not at pleasure. The theoretical action of the instrument appears now to be the following: The waves of light from an object are conducted through the ordinary camera, so that they fall on certain of the divisions of the mirror when the electric circuit is closed. The light and accompanying heat produce momentary chemical changes in the amalgam of the mirror—which consists of a peculiar compound of selenium and chromium. These changes modify the electric current and cause similar changes in the corresponding partitions of the remote speculum, thus reproducing a similar image, which, by a second camera, may be readily seen by the eye or thrown upon a screen. Dr. Licks explained how the proportions of selenium in the mirror and speculum should be scientifically adjusted to the size of the divisions and the resistance of the electric circuit, so as to avoid any blending of the portions of the reproduced image. This, he said, had been the problem which had caused him the most difficulty, and which at one time had seemed almost insurmountable.

At the close of the paper an illustration was given of the powers of the instrument. The mirror of the diapbote, in charge of a committee of three, was taken to a room in the lower part of the building and the connecting wires laid through the halls and stairways to the speculum on the lecturer's platform. Before the mirror the committee held, in succession, various objects, illuminating each by the light of a burning magnesium wire, and simultaneously on the speculum appeared the secondary images, which for exhibition to the audience were thrown on a screen considerably magnified. An apple, a penknife and a trade dollar were the first objects shown; on the latter the outlines of the Goddess of Liberty were recognized, and the date of 1878 was plainly legible. A watch was held five minutes before the mirror, and the audience could plainly perceive the motion of the minute hand on the screen, but the movement of the second hand was not satisfactory seen, although Prof. Kannich, by looking into the camera, thought that it was there quite perceptible. An ink bottle, a flower and a part of a theater bandbill were also shown, and when the head of a little kitten appeared on the screen, the club testified its satisfaction by the most hearty applause. After the close of the experiments the scientists extended their congratulations to Dr. Licks, and the President made a few remarks on the probable scientific and industrial applications of the diaphote in the future. With the telephone and the diaphote it might yet be possible for friends, separated by the wide Atlantic, to bear and see each other at the same time; to talk, as it were, face to face.

HARNESSING ELECTRICITY.—Mr. W. H. Barlow, the new President of the Institution of Civil Engineers, London, in his recent inaugural address, speaking of the rapid growth of telegraphy and other practical applications of electricity, said that the diminution of power, from increased length of the conducting wire, had been surmounted by relays of power at fixed stations. (This was the discovery of Morse.) By employing this ingenious expedient on the Indo-European Telegraph, Calcutta had frequently been put in direct communication with London, a distance of 7,000 miles. He further stated that Dr. C. W. Siemens had ascertained that in employing electricity for the transmission of power, including all sources of loss, 50% of the original power could be realized by electric wires at a distance of one mile from the motor; and that with adequate provisions against heating it would be no dearer to transmit electro-motive power to a greater than to a smaller distance. Sir William Armstrong, by means of an electro machine and wire, works his circular saw at a distance of a mile from the water wheel that turns the electric machine. By the same means Dr. Werner Siemens works a locomotive that carries thirty persons.

Recent Progress in Chemistry.

Professor Dewar, F. R. S., Jacksonian Professor in the University of Cambridge, England, lately commenced a course of sight lectures on "Recent Progress in Chemistry," at the Royal Institution, London, where he fills the chair of that science. In his first lecture he dealt with the advances in chemical theory made good by the two main lines of attack on the mysteries of chemical action. These were—first, the hypothesis that matter is constituted of molecules in motion, whose structure and action may be ascertained from the investigation of sensible masses of matter; and the other, or modern method, which was based solely on the two fundamental laws of physical action, namely, the conservation of energy and its general tendency towards dissipation. Thus, chemical science, so long statical, had now an extensive dynamical literature, as an admirable example of which was mentioned the lately published work of Professor Berthelot, of Paris, entitled "*Essai de Mecanique Chimique, fondee sur la Thermochimie.*"

The lecturer then proceeded to illustrate the great advance in our knowledge and in our power of manipulation of high temperatures, referring to the immense industrial advantages derived from the introduction of Siemens' regenerator into all chemical manufactures involving the necessity of using furnaces at white heat. He proceeded to show that the recent introduction of magneto-electric machines enabled chemists to examine the interaction of bodies at temperatures far above that of any flame, which never exceeded 3,000°. With this view he showed, for the first time in public, experiments of his own. As an instance may be given his raising a carbon tube inclosed in lime by means of the Siemens electric arc to so high a temperature that the intensely heated part of the tube became changed into graphite, and by passing a mixture of equal volumes of hydrogen and nitrogen through this tube he formed prussic (hydrocyanic) acid by the direct union of carbon, hydrogen and nitrogen. He thus proved that this exceptional chemical combination is not brought about by any occult electrical effect caused during the transit of the electricity in the arc, but that it is the result of the exceptionally high temperature of the carbon in presence of the gases. The old doctrine of chemical affinity had, in fact, been so far modified as to accord with a mechanical definition, which might be thus formulated: That if two or more compound bodies are capable of reacting chemically to form new substances, then that substance will be formed which, *par excellence*, is attended with the greatest dissipation of energy—*i. e.*, with the greatest evolution of heat.

Further experimental illustrations were given of apparent anomalies in chemical decompositions brought about by the passage of electric currents through fluids. Thus it was publicly shown for the first time that acidulated water, which is readily decomposed into hydrogen and oxygen by the current of a single pair of voltaic cells, was yet seemingly quite unattacked by the passage of the powerful intermittent current of De Merritens' magneto machine, which has a power of, say, 50 cells of Grove's battery This, it was explained, was due to the superposition of alternate layers of hydrogen and oxygen at the poles something like 300 times every second under the most favorable conditions for chemical recombination. The apparent absence of decomposition could only be explained by the constant interchange of decomposition and recomposition. This was demonstrated by the use of the telephone, which revealed a rapid intermittent current passing through the cell, and further by the continuous rise in temperature of the contents of the cell. The lecturer proceeded to deal with the allotropic modifications of bodies, which branch of the subject he proposes to continue in his next lecture.

HUNTING BY ELECTRICITY.—A new application of the Ruhmkorff coil has been made in the neighborhood of Marseilles. Instead of using bird-lime on trees which are frequented by birds of passage, a copper wire is wound around the trunk and a decoy attached to a neighboring staff. When a numerous flock has been attracted by the decoy, a shock is sent by the commutator, and they are more surely stunned than by a rifle. Experiments of a similar kind have also been made by M. Dalmas upon the vines at his country-seat, and powerful shocks are said to have destroyed the parasites together with their eggs. If this statement is confirmed, the ingenious inventor may reasonably expect the prize of 100,000 francs, which has been offered for the destruction of the phylloxera.—*Les Mondes.*

PREDICTION OF HARVESTS.—Herve Mangon has examined the climatological conditions of the years from 1869 to 1879, in Normandy, and their influence upon the ripening of the crops. He gives three tables of the amount of heat received by different grains between planting and harvesting, and draws two important practical conclusions: 1. In a mild and regular climate it is generally desirable to sow the crops early in the fall. 2. By observing each year the amount of heat received subsequently to planting, and by consulting properly prepared tables, it is possible to calculate a month or six weeks in advance the time of harvest. In his own tables he fixed upon 6° C. (42.8° F.) as the growing limit, and recorded the number of degrees at each observation above that limit.—*Comptes Rendus.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 4.		Week Ending Mar. 11		Week Ending Mar. 18		Week Ending Mar. 25	
Alpha	9	7⅞	8⅛	8	8⅛	7	8⅛	7⅞
Alta	4.20	3⅝	3.80	3⅜	3.55	3.35	4	3⅝
Alta	80c	60c	75c	50c	65c	45c	75c	55c
Andes	.....	.....	.....	.....	.....	.....	.....	.....
Alps	75c	50c	95c	60c	70c	65c	70c	65c
Argenta	.....	.....	.....	.....	.....	.....	.....	.....
Atlantic	.....	.....	60c	.....	.....	.....	.....	.....
Aurora Tunnel	.....	.....	25c	.....	40c	25c	35c	30c
Baltimore Con	.....	.....	.....	.....	.....	.....	.....	.....
Belcher	12⅝	12	12⅝	9½	8⅞	5½	6	5½
Belmont	30c	25c	20c	.....	20c	15c	30c	15c
Best & Belcher	10⅜	9⅝	10⅜	9⅜	9¾	9¼	10⅛	10
Bullion	5	4.10	5⅛	4.55	4.60	4.35	5	4.40
Bechtel	2.05	2	2.35	2	2.05	2	2	.....
Belle Isle	1.10	1.05	1⅛	1⅛	1⅛	1.10	1.20	1.05
Bodie	9⅛	8⅛	9	8⅛	8⅝	7⅞	7⅞	7⅛
Benton	2.45	2	2.45	2.20	2.25	2	2.40	2.10
Bulwer	9⅛	8⅝	9⅛	8⅝	9⅛	9	9⅛	9
Boyle	.....	.....	.....	.....	.....	.....	.....	.....
Black Hawk	80c	75c	1⅛	80c	1	70c	80c	60c
Belvidere	4.55	2.85	3.80	2⅜	3⅛	3⅛	3⅜	3.40
Booker	80c	60c	90c	60c	65c	60c	60c	55c
Caledonia	1.45	80c	1.40	1.15	1⅛	1.05	1.40	1.05
California	3⅜	3.20	3.65	3.40	3.55	3⅜	3.55	3.15
Challenge	1⅞	1.65	1⅞	1⅜	1.55	1⅛	1⅛	1⅛
Choller	6¼	5½	6¼	5⅜	6	5½	6¼	8
Confidence	7	.....	7⅞	7	7⅞	6	7⅛	7
Con Imperial	85c	55c	65c	55c	55c	50c	65c	50c
Con Virginia	3.70	3.45	3.70	3⅛	3.60	3.40	3.55	3.35
Crown Point	4⅜	4.45	4⅛	3.40	3.30	2.80	3⅛	2.95
Con Washoe	.....	.....	.....	.....	.....	.....	.....	.....
Champion	50c	30c	60c	25c	40c	35c	40c	30c
Concordia	50c	.....	60c	45c	60c	40c	50c	.....
Dayton	.....	.....	.....	.....	.....	.....	.....	.....
DeFrees	.....	.....	.....	.....	.....	.....	.....	.....
Daney	.....	.....	.....	.....	.....	.....	.....	.....
Day	55c	50c	60c	40c	55c	40c	1⅛	75c
Eureka Con	14⅛	13⅜	15½	15	17⅛	14⅛	21⅛	18⅜
Exchequer	3⅜	3	3.60	3	3.10	2.85	3⅛	3
Endowment	20c	15c	20c	15c	15c	10c	10c	.....
Gen Thomas	.....	.....	.....	.....	.....	.....	.....	.....
Grand Prize	1.40	1.30	1.40	1⅛	1.70	1.30	1⅛	1⅛
Gila	20c	.....	25c	.....	25c	.....	.....	.....
Golden Chariot	.....	.....	.....	.....	.....	.....	.....	.....
Golden Terra	.....	.....	.....	.....	.....	.....	.....	.....
Goodshaw	35c	20c	50c	45c	40c	30c	40c	35c
Gould & Curry	5⅛	4.95	6¼	5	5⅛	4.90	5⅜	5⅛
Hale & Norcross	7	5⅝	6⅞	5⅛	5⅛	5⅛	6¼	6
Hillside	1¼	1	1.40	1.10	1	75c	90c	75c
Highbridge	.....	.....	.....	.....	.....	.....	.....	.....
Homestake	.....	.....	.....	.....	.....	.....	.....	.....
Hussey	90c	.....	1⅛	1⅛	1.20	1	1	.....
Independence	1.65	1⅛	1.40	1⅛	1.15	1.05	1⅛	1.10
Julia	1⅛	1.30	1.55	1	1.60	1⅛	2	1.55
Justice	2	.....	2⅛	2	4	3⅛	4⅛	4
Joe Scates	.....	.....	.....	.....	.....	.....	.....	.....
K K Con	5	4	3	3½	3	3½	4	3⅝
Kentuck	3¾	3	3¼	3	3	.....	3	.....
Kosmith	15c	.....	.....	.....	10c	.....	.....	.....
Keystone	.....	.....	.....	.....	.....	.....	.....	.....
Lady Bryan	50c	35c	50c	30c	40c	5c	45c	20c
Lady Wash	80c	65c	75c	65c	60c	.....	80c	65c
Leopard	15c	10c	10c	.....	10c	.....	30c	.....
Leviathan	15c	10c	15c	10c	15c	10c	40c	35c
Leeds	60c	.....	50c	.....	60c	50c	50c	.....
Lee	.....	.....	.....	.....	.....	.....	.....	.....
May Belle	25c	20c	35c	25c	20c	.....	25c	15c
Modoc	40c	.....	40c	.....	40c	.....	.....	.....
Manhattan	1¼	.....	1.55	1.30	1	80c	.....	90c
Martin White	90c	85c	85c	75c	75c	.....	80c	55c
McClinton	70c	45c	1	65c	80c	65c	80c	65c
Meadow Valley	.....	.....	.....	.....	.....	.....	.....	.....
Mexican	16	14⅛	16⅞	14⅛	14⅛	13⅜	14⅛	14
Mides	.....	.....	.....	.....	.....	.....	.....	.....
Morning Star	.....	.....	.....	.....	.....	.....	.....	.....
North Con Virginia	.....	.....	.....	.....	.....	.....	.....	.....
New York	45c	35c	40c	35c	45c	35c	45c	35c
Northern Belle	16⅛	15⅛	16⅞	16⅛	18	16⅛	18⅛	17⅞
New Coso	.....	.....	.....	.....	.....	.....	.....	.....
Navajo	30c	25c	30c	.....	35c	30c	35c	25c
Occidental	1.10	1	1.05	90c	90c	70c	1.30	95c
Ophir	18	17	18⅜	17⅛	18⅛	17	18⅛	17⅛
Oriental	.....	.....	.....	.....	.....	.....	50c	.....
Overman	6⅜	6⅛	6½	5	5½	1.95	2.60	2
Panther	.....	.....	.....	.....	.....	.....	.....	.....
Phenix	.....	.....	2	.....	.....	.....	.....	.....
Phil Sheridan	20c	.....	20c	.....	.....	.....	10c	.....
Potosi	4.85	3.40	4.65	4	4.30	4⅛	4.70	4.10
Prospect	.....	.....	.....	.....	.....	.....	.....	.....
Raymond & Ely	1	50c	1	95c	1	85c	85c	75c
Richer	.....	.....	.....	.....	.....	.....	.....	.....
Rock Island	.....	.....	.....	.....	.....	.....	.....	.....
Rye Patch	.....	.....	.....	.....	.....	.....	.....	.....
Rough & Ready	.....	.....	.....	.....	30c	.....	.....	.....
Savage	6⅞	5⅛	6⅛	5	5⅛	5	6⅛	5⅜
Seg Belcher	16	.....	17⅛	17	18	14	15	14
Sierra Nevada	23⅜	22	23⅜	21⅛	21⅛	20⅜	21⅛	20⅛
Silver Hill	1.30	90c	1	75c	1	75c	1	80c
Silver King	7	.....	7	.....	7	6	6	5⅛
Silver Prize	.....	.....	.....	.....	.....	.....	.....	.....
Succor	.....	.....	.....	.....	.....	.....	.....	.....
Summit	1⅛	1	2	1⅛	1⅛	1.10	1.10	1
scorpion	3.10	3	3⅜	3	3	2.80	3⅛	3
Solid Silver	100	.....	.....	.....	40c	30c	20c	.....
South Bodie	85c	60c	80c	75c	75c	60c	60c	55c
South Standard	25c	15c	35c	20c	25c	20c	25c	2 0
Star	25c	20c	30c	.....	25c	20c	25c	.....
St. Louis	.....	.....	.....	.....	.....	.....	.....	.....
Syndicate	1.45	1.30	1⅛	1⅛	1.60	1.35	1⅛	1.40
Tioga Con	2⅜	.....	3	.....	2.70	2.30	2.30	2.40
Tiptop	5⅛	4.60	5	4⅜	4.30	4⅛	4⅜	4
Trojan	15c	.....	15c	10c	.....	.....	.....	.....
Union Con	37⅛	32⅛	40⅛	36⅛	37	35	38⅛	36⅛
Utah	12	11	12	10⅜	10⅛	9⅛	10⅛	9⅛
Vermont Con	.....	.....	.....	.....	.....	.....	.....	.....
Ward	1⅞	1.60	2	1⅛	1.65	1⅛	1⅛	1.65
Wells-Fargo	5c	.....	5c	.....	.....	.....	5c	.....
Woodville	.....	.....	.....	.....	.....	.....	.....	.....
White Cloud	.....	.....	.....	.....	.....	.....	.....	.....
Yellow Jacket	9⅛	8⅛	9⅛	8⅛	8⅛	7⅞	8⅛	7⅛

Sales at S. F. Stock Exchange.

Friday A. M., Mar. 19.

60 Alpha 8⅛
150 Alta ..... 3.80@4
870 Andes ..... 75@76c
130 Benton ..... 2.35@2.40
360 Bullion ..... 4@4.90
550 Belcher ..... 5⅛@5⅜
120 Best & Belcher ..... 10@10⅛
550 California ..... 3⅛@3.35
100 Con Virginia ..... 3.40@3.45
160 Chollar ..... 6@6⅛
40 Confidence 7
1380 Con Imperial 55c
210 Crown Point 3.20
580 C Dorado 1⅛
400 Caledonia ..... 1.40@1.45
80 Exchequer 3.20
100 Essex 1.90
250 Golden Gate 70c
99 Gould & Curry ..... 5⅛@5⅜
445 Hale & Nor 6⅛
405 Julia ..... 1.30@1.40
465 Justice ..... 1.90@2
850 Leviathan ..... 40@35c
120 Lady Bryan 30c
760 Lady Wash ..... 80@75c
230 Mexican ..... 14@14⅛
100 Mackey 15c
750 N Bonanza 50c
700 New York 45c
270 Ophir 18⅜
100 Occidental 95c
1205 Overman ..... 2.60@2.40
100 Potosi ..... 4⅛@4.65
400 Pioneer 20c
160 Savage 6
350 Scorpion 3⅛
100 Silver Hill 95c
10 Seg Belcher 14
85 Sierra Nevada 21⅛
10 Utah 10⅛
165 Union Con 37⅛
100 Ward 1⅞
270 Yellow Jacket ..... 8⅛@8⅜

AFTERNOON SESSION.

530 Argenta ..... 65@70c
1070 Albion 2c
100 Argenta 65c
35 Albion 35c
1300 Atlas 5c
600 Best & Belcher ..... 10⅛@10⅜
280 Belvidere ..... 3.40@3⅝
240 Bullion ..... 4.90@5
645 Belcher ..... 5⅛@5⅜
100 Baltimore Con 30c
175 Belle Isle 1.20
15 Bodie ..... 7⅛@7⅜
10 Bulwer 9⅛
600 Booker 60c
150 Boston 1.15
110 Con Virginia ..... 3.45@3⅝
500 Con Imperial ..... 55@56c
280 Crown Point ..... 3⅛@3.15
250 Chollar ..... 6⅜@6⅝
90 California ..... 3.35@3.40
230 Caledonia ..... 1.30@1⅜
200 Challenge 1⅛
270 Con Dorado 1⅛
30 Coniidence 7⅛
40 O Pacific 22
1620 Day ..... 80@90c
400 D Standard 1
100 Dudley 70c
220 Exchequer ..... 3⅛@3.20
100 Essex 1⅛
270 Gold Exchange 1⅛
90 E M Diablo 1⅛
500 Flowery 20c
195 Gould & Curry ..... 5⅛@5⅜
560 Grand Prize ..... 1.65@1.70
100 Golden Gate 70c
100 Goodshaw 40c
70 H & Norcross 6⅛
300 Hillside 75c
190 Justice 1.90
100 Julia ..... 1.30@1⅛
40 Jackson 1⅛
240 Jupiter ..... 2⅛@2.45
100 K K Con 3⅛
250 Lady Wash ..... 75@70c
550 Leviathan ..... 35@40c
600 Leopard 10c
100 Loyal Gate 70c
100 Goodshaw 40c
70 H & Norcross 6⅛
300 Hillside 75c
190 Justice 1.90
100 Julia ..... 1.30@1⅛
40 Jackson 1⅛
240 Jupiter ..... 2⅛@2.45
100 K K Con 3⅛
250 Lady Wash ..... 75@70c
550 Leviathan ..... 35@40c
600 Leopard 10

100 Goodshaw	40c	20 Potosi	4¦
20 Gould & Curry	84	20 Savage	5¦
100 Golden Gate (B)	70c	20 Sierra Nevada	20½@20¾
300 Glynn Dale	10c	200 Silver Hill	80@82c
20 Hale & Nor	6¦	100 S Bodie	10c
100 Justice	1.70	20 Utah	10
100 Leviathan	35c	20 Union Con	37½@37¾
20 Mexican	14½@14¾	200 W Comstock	10c
30 Ophir	17½@17¾	200 Wells-Fargo	3c
10 Overman	2.20	10 Yellow Jacket	7¦

Mining Share Market.

Supreme dullness has prevailed throughont the week. All attempts to force a rise npon the market have been signal failures. This must be the resnlt of the impecnniosity of outsiders which prevents them from accepting the offers of fortunes, which are so freely presented to their notice. Another, and a powerful canse, is to be fonnd in this legislative tendencies of obstructing all mining operations by the threatened enactment of statutes with such objectionable features as would, if put into execution, result in the destruction of the mining stock business. When this incubus shall have been thrown off, there cannot fail to arise a more prosperous and healthy condition in mining matters. The mines themselves, so far as this State is concerned, have never evinced a more solid and lucrative status than they now do, aod if the state of the market was solely dependent upon them, it would be in a very active and extensive routine of operations. Outside capital stands ready to invest in our mines as soon as these vexed questions of law inflictions are sct at rest. With rich mines, genial climate and remarkably favorable accessibility, our mines are sure to meet their due recognition from men of means when no impedimeuts stand in the way of a just and free development of them.

It may be noticed, in this connection, that the New York *World* of the 24th inst. says that that day the mining share market in New York was a very active one, the sales amounting to 102,000 shares, against 77,000 shares on the day previous. It is pretty well settled now that the mining stock business of the country will hereafter be at New York. It is not probable, however, that all the bad features which existed here will be countenanced there.

We see also that Leadville has started a mining and stock exchange. The object is, as stated by the circular, to "ascertain and fix the value on gold, silver and other meritorious mines in Colorado; to place upon the market and aid in the sale of good mines and mining stocks." That is a good idea making a distinction between mines and mining stocks.

Bullion Shipments.*

Since onr last issue, we have noticed the following hullion shipments:

Alexander, Mar. 8, $2,060.85; Mar. 10, $1,043.25; Mar. 12, $1 278.22; Horn Silver, Mar. 16, $4.858; Mar. 17, $13,842.75; McCorkindale Co. received of Horn Silver hullion: Mar. 1 to 16, 103,424 lbs.; Mar. 18, 32,710 lbs.; Mar. 19, 19,881 lbs.; Christy, Mar. 15, $1,497.12; Mar. 16, $2,164 47; Mar. 17, $2,111.42; Mar. 20, $2,277.41; McCormick & Co. received Mar. 15, $8,550; Mar. 16, $9,650; Mar. 18, $6,450; Mar. 19, $18,250; Mar. 20, $4,450; Barbee & Walker, Mar. 15, $1,726 90; Mar. 17, $3,764.55; Paradise, Mar. 15. $4,089 36; Bodie Con., Mar. 15, $6,318; Mar. 22, $5,317; Northern Belle, Mar. 15, $8,413.62; Mar. 17, $7,849 38; Standard Con., Mar. 15, $45,835 96; Bulwer Con., Mar. 15, $10,900.52; Wells, Fargo & Co., at Eureka, Mar. 18, $6,711.72; Mar. 21, $1,000; Wells, Fargo & Co., at Pioche, Mar. 20—for one week $4,238.41; Grand Prize, Mar. 22, $6,000; Con. Virgioia for March, $55,087.50; Stewart, Mar. 19, $7,000; Richmond, Mar. 20, $20,900; Silver King, Mar. 14, 10,700 lbs. concentrations; Tiger, Mar. 14, $8,000; Eureka Con., Mar. 21, for one week, 186,865 lbs.

*Desiring to make our list of Bullion Shipments as complete as possible, we will he thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

"THE CALIFORNIAN."—The April number of the new San Francisco magazine is before the pnblic. The *Morning Call*, in speaking of it, says: "In its attractive table of contents we regret to note the almost entire absence of the female element—hut one or two articles of the more solid dishes being credited to lady authors. This ought not to be, when we have so many capable and brilliant writers of both prose and verse of the gentler sex in onr midst. Let them come forth and show themselves, and not permit their sturdier hut not more accomplished brothers to bear all the hurdens and carry off all the honors, if such are achieved, in launching this literary venture upon the sea of popular opinion. In the light and lively "outcroppings," however, we recognize the deft fingers and lively intellect of several of our well-known female authors, Miss Clifford's pleasant little paper on "Pets," and some of the pieces of verse in this department being especially graceful and readable. Mrs. Ludlum's "Captain Molly" is an excellent specimen of story writing, and Miss Manning discourses in quite charming style of life at "Agua Tihia." Edgar Fawcett contrihntes a thoughtful essay on "Americanism in Literatnre;" and without going into further detail we merely remark that the current nnmher shows in many respects a marked and gratifying improvement in the magazine.

Mining Summary.

This following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

QUARTZ MOUNTAIN.—*Ledger*, Mar. 20: Thero is a great activity around this uline at Lower Rancheria. It is, as its nams implies, a mountaiu of quartz. Although the rock gives fair assays, it has been found impossible to work it to advantage by ordinary mill process. Thoy are putting up a roasting furnace, believing by that means the rebellious character of the ore may be overcome.

ZIBLE.—Twenty-five stamps are running, the supply of water being inadequate to run the full capacity of the mill. In a week or so connection will be made with the Moors ditch, when everything around mill and mine will be in full operation.

BUTTE.

FIRE.—*Register*, Mar. 19: The Banner quartz mill was discovered to be on firs Wednesday morning about one o'clock. The alarm was given at once, but no efforts of those present could suppress the flames, and the result was it burned to the ground, probably rendering the machinery worthless. It cost, with the machinery, $15,000. It was set on fire.

CALAVERAS.

A BONANZA MINE.—Lodi *Review:* A rich quartz mine has recently been discovered in the Iron mountain, two miles south of Lane's springs. It is called the Mattie mine. Several pans of the casings washed yielded from 20 to 60 cents to the pan in gold. Two or three assays of the rock have been made, which run away up into the thousands.

ANOTHER DISCOVERY.—*Advertiser*, Mar. 18: Mr. Due, while prospecting on Murray's creek, about a mile from the Rodiscino mine, discovered a fine ledge of rich quartz. The ledge at present is two ft in width, being in the slate belt, and, judging from specimens shown us, which were immensely rich, it will no doubt pay well.

DOLAN & COGSWELL.—*Mountain Echo*, Mar. 10: Is a mountain of ore, which yields from $5 to $10 a ton. The ore has been worked in arastras, always paying good wages. The owners have erected a 10-stamp mill, and find hy milling their ore that they can save a much larger percentage of gold than hy the former process.

EL DORADO.

THE SILVER MINE.—*Mountain Democrat*, Mar. 20: Later reports are even more flattering than those first received from the silver mine in Kelsey township. Samples of ore, taken from the point of junction of the north and south with the east and west ledge, yielded at the rate of $82.25 in gold and $59.80 in silver. Some of the former tests yielded $159 per ton in both metals, hut the one above noted was on a larger scale and conveyed a better assurance of general results from the treatment of the ore by mill process. The later tests leave but little room to doubt that thousands of tons can be mined from these ledges at comparatively insignificant cost, that can he depended on to yield from $50 to $75 by ordinary mill process.

MARIN.

RICH MINE IN NICASIO.—San Rafael *Journal*, Mar. 18: Mr. C. Murray, of Nicasio, has a superh mining prospect on his ranch, a mile northeast of the Nicasio hotel, from the croppings of which some splendid assays have been made. The ledge haa been traced for two or three miles. A piece of ore assayed $47.14 to the ton.

MONO.

STANDARD CON.—*Chronicle*, Mar. 15: The new shaft is down 819 ft. Tho north drift from the cast crosscut, 500 level, is in 105 ft, making a progress for the week of 15 ft. The upraise from the south drift is up 80 ft. The ledgo is five ft wide of rich ore. The upraise on the Cook ledge is up 80 ft, with a ledge two and a half ft wide of good milling ore. The north drift, east ledge, 300 level incline, is in 209 ft; the ledge is two and a half ft wide. The south drift from the west crosscut is in 230 ft, with a ledge three ft wide of fine ore. On the 385 level, north of the crosscut, they have the hanging wall. The vein is 78 ft wide, all ore except five ft of "horse" at the center. In the West Standard stopes the ledge is five ft wide, with no change to oote.

JUPITER.—On the 500 level the west crosscut from the main shaft is in 137 ft, and the west crosscut from south drift No. 2 is in 85 ft. In both, the character of the ground is much improved.

BULWER CON.—The north drift on the Ralston ledge has a total distance from the tunnel of 103 ft. The ledge is three ft wide and looks well. The south drift is in 100 ft. The ledge is two ft wide of good ore. In the south drift on the Ralston vein they are stoping from a ledge three and half ft wide of good ore.

SUMMIT.—The north drift, 531 level, is in from the shaft 145 ft, showing a vein two ft wide. Tho upraise from this drift 93 ft south of the sbaft, is up 52 ft. The ledge is two and a half ft wide.

BELVIDERE.—Tbo joint south drift is in 100 ft. The ledge in this drift has a width of four ft. The main west crosscut is in 96 ft. The south drift is in 39 ft, and the ledge is four ft between the walls, carrying from 18 inches to two ft of good milling ore. The north drift from the top of the upraise has been extended the ledge 23 ft north of the shaft, showing four and a half ft of clean ore.

DOUBLE STANDARD.—The north drift is in 10 ft from the crosscut, showing a vein three ft wide of good ore. The south drift has a ledge in the face two and a half ft wide. Samples from both the drifts show au average assay of $48.55 per ton.

ADONOA.—Bodie *News*, Mar. 21: The new shaft is down 295 ft. The formation is a soft, gray porphyry, containing seams of bright, lively quartz. The shaft is expected to cut the main Addenda ledge at a depth of 550 ft.

GOOSEBAR.—The station at the 600 level is completed and croscutting for the veins cut on the 450 level has commenced. The winze on vein No. 2, 450 level, is down 135 ft. There are four ft of ledge matter and two ft of good ore on the bottom. A circumstance of peculiar significance on this level and in the winze is that veins 2 and 3 are only 16 ft apart, and pitching towards a common center, and every indication goes to show that these two ledges must come in contact and unito very soon. At the 000 level the crosscut will cut these veins.

UNIVERSITY.—The shaft is down 417 ft. The rock in the bottom is of a good working character and improving daily.

SOUTH NOONOAY.—Drifting north and south on the vein has commenced. The ledge in both drifte ie looking well. The pay stratum is three ft wide, and the ore gives good assays. About three tons are hoisted daily.

NORTH BULWER.—The shaft is down 75 ft. At 70 ft a fine ledge was cut, seven ft wide, with clean-cut walls, carrying one seam of rich ore that gives fahulous assays. In addition, the fissure carries vein porphyry with seams of bright, lively quartz and clay, giving good assays.

SOUTH BULWER.—*Free Press*, Mar. 19: They have completed cutting out station at 550 level and commenced crosscutting east toward the Miller ledge, passing through hard, iron-stained porphyry, and at present have a large flow of water coming in from the face of the crosscut. Every indication points toward a speedy intersection of the ledge passed through in the shaft at a depth of 530 ft. The west crosecut, 500 level, is in 20 ft.

BLACKDAWK.—The shaft is down 690 ft, and the hottom is now in hard rock. The small veins that have been following the shaft continue and show a slight improvement. A station will be opened at the 700 level, and crosscuts east and west will he started. The winze on the 320 level is down 85 ft, the rock being hard. The vein is 20 inches wide.

QUEEN BEE.—The north drift on the 400 level is in 220 ft. Theontire width of the drift is in a ledge of fine milling rock. West crosscut, same level, 200 ft north of east crosscut, is in 31 ft. East crosscut, at the same point, is in 33 ft.

BODIE TUNNEL.—A ledge of good millling ore has been cut, four ft wide. The winze at the 1000 station is down 18 ft, showing a strong, well-defined ledge, averaging assays of $30 in gold.

ORO.—The west crosscut, tuunsl level, is in 240 ft, the face still continuing in low-grade quartz and porphyry. The main shaft is 100 ft below the first level: total depth, 330 ft.

NEVADA.

SPANISH.—*Transcript*, Mar. 15: Is situated near the Nevada City and Merrifield mines, and it is claimed to be on the same lead as the latter. It has a tunnel 350 ft long, with a 375-ft drift along a three-ft ledge, with good ore in the face. It has produced altogether about 500 tons of ore. One hundred tons extracted last year paid at the rate of $15 per ton.

PHŒNIX.—Has been lying idle for three years, and was recently relocated by agents of the Phœnix company, of New York. The original holders sauk an incline over 300 ft deep and ran several hundred ft of levels. They also ran a drain tunnel 1,200 ft, intersecting the incline 200 ft below the surface. Several hundred tons of ors, paying from $15 to $60 a ton, have been taken out.

THOMAS.—Has been worked on the surface since 1852, and always paid. The incline is now below the 650 level, and now pumps are being put in. One chute of ore on the bottom level has been drifted 050 ft. The ledge is two ft thick, and of high grade all through. There are frequently found in the ledge bodies of several hundred pounds of ore that pay at the rate of $25,000 or $30,000 a ton. The average daily output at present is about 18 tons.

MOHICAN.—A crushing of 42 tone yielded in free gold $1,066.18, besides four tons of sulphurets assaying $83.65 a ton. The average yield per ton was therefore about $30. Most of the ore was taken out in sinking the shaft, which is 140 ft deep, and from the 120-ft east drift. There are 60 tons of the same character on the dump. The first crushing paid $12.50 a ton; the second, $14.57; and, as we have shewn above, the last shout $30.

LECOMPTON.—In its early days this claim produced, above water level, some $225,000, and paid $70,000 in dividends. The ledge varies from six inches to one and one-half ft in thickness, and is exceedingly rich.

PROVIDENCE.—The lodging is down 1,023 ft. Thero have been developed, between the 500 and 1000 levels, several chutes of ore, the existence of which was not previously known. The work done thus far has been mainly for the purpose of development, only about 40 tons of ore per day being hoisted. The result is that the owuers have in sight enough ore to run the present 20 stamps for 20 years without opening another foot of ground. There are being worked five distinct parallel ledges that are from 3 to 14 ft thick. The ore is very rich in sulphurate and free gold. The new incline, 1,700 ft south of the present one, is down to the 000 level. It is proposed to increase the present mill capacity of 20 stamps to 60 or 80 stamps this spring, and hoist from both inclines, thus being able to turn out about 150 toos of ore a day. There are very extensive chlorinstion works connected with this property.

KINOSSURY.—Is on Little Deer creek, half a mile east of the city. It has a 120-ft shaft, and the tunnel is 500 ft long. The ledge averages about 14 inches. The ore has averaged from $12 to $16 a ton, and there are about 1,000 tons in sight in the backs.

EL CAPITAN.—Have sunk the incline 150 ft and run north and south drifts a distance of 400 ft. The fissure is 00 ft wide on this level. Ore bas been found in both drifts, the ledge heiog two ft thick. Ahout 150 tons has been taken out.

COLD SPRING GRAVEL.—An incline has been sunk 400 ft and the channel drifted 600 ft. Some good gravel was taken out, but the expenses of hoisting and pumping were so heavy that a tunnel was started, which is in 450 ft, and will have to be exteoded 900 ft further. The company have expended about $20,000 in the development of their claim, which coneists of 425 acres held under a patent.

NEW YORK.—Consists of 120 acres of patented ground on Deer creek, two milea from the city. There are six ledges, varying in thickness from two to six ft. The lead on which the hoisting works are erected is supposed to he a continuation of the Big Blue, from which the Murchie company has taken so much money. There is free water for hoisting nine months in the year. There is a 10-stamp mill on the ground.

WYOMING.—The incline is down 500 ft, with drifts north and south. The ledgo is 2 to 10 ft wide, and 6 men stoping keep 10 stamps huey. The lower main tunnel is being extended along the ledge to the north.

OMBOA.—Owns a half section of land, on the channel, of gold-bearing gravel at Omega, together with a ditch and water right, and work their claims hy the hydraulic process. The present company has been operating for about 10 years, taking out from $60,000 to $100,000 of gold hullion per annum. The mine has a bright future, as a large portion of the claim is yet untouched.

SAILOR FLAT.—This mine is owned hy practical miners who, although working on a limited scale, produce from it a sum approximating $50,000 per season.

PITTSBURG.—Orass Valley *Union*, Mar. 21: An important development has heen made, striking a new pay chute on the 800 level north, 350 ft from the sbaft. The ledge is from 10 to 20 inchee in size, carrying well in heavy sulphurets, galena and free gold. This is a distinct chute from any ever before discovered, and hids fair to add greatly to the previous value of the mine. On the same level, 300 ft south of the shaft, or 750 ft distant from where the fine rock has been struck, a winze has been sunk, which opened a ledge of high grade ore, being between two and three ft in eize, and milling from $80 to $100 per load. From this it will he seen that the Pittaburg has two distinct pay chutes, both rich.

MINING ITEMS.—*Herald*, Mar. 18: The North Bloomfield company have heen running 1,500 ioches of water through the winter, and have kept a large force of men employed. The Eagle gravel mine, at Relief hill, is commencing work on a more extensive scale. A quartz ledge two ft in thickness was discovered on Picky hill. After sinking to a depth of five ft a ledge of two ft in thickness was struck. They have now reached a depth of about 10 ft, and the vein still continues to hold out well. It prospects from one to two bits a pan.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Virginia City *Enterprise*, Mar. 21: On the 2500 level the main drift has a total length of 278 ft from the incline. The east drift is now 200 ft from the station. On the 2300 level the joint Mexican east crosscut is in 200 ft from the main north drift. East crosscut No. 1 is in 68 ft from the north drift in the Hardy vein. On the 2200 level the north drift in the Hardy vein is in 172 ft from the main north drift. On the 2100 level winze No. 2 has been sunk and timbered to a depth of 11 ft, and shows good milling ore in the hottom. The drift north from the bottom of No. 1 winze is in 32 ft.

YELLOW JACKET.—The north winze lacks hut 10 ft of being down to the 2900 level. The west crosscut, 2700 level, is in 184 ft. They are placing a diamoud drill at the hottom (2,863 ft doep), to learn whether they are likely to meet any quantity of water when sinking is reamed.

UNION CON.—On the 2300 level the joint Mexican crosscut on the southern boundary is in 224 ft from the main north drift. On reaching a point 305 ft from the north drift a joint Mexican winze will bo sunk on the 2500 level. On the 2400 level winze No. 1 has a total depth of 48 ft, the hottom showing some ore giving low assays. The south drift is now 356 ft from the Union shaft, the face showing porphyry carrying some quartz. The Union shaft has been sunk and timbered to a point 65 ft helow the 2400 station.

SILVER HILL.—The face of the 1300 crosscut is in ledge material with streaks of low-grado quartz; it looks well. Forty-two ft have been excavated and timbered the last week. The south drift has heen extended 35 ft. It is still west of the quartz found in the crosscut.

CALIFORNIA.—During the past week thoy have hoisted 201 tons of ore. Oo the 1500 level the west crosscut is now in 147 ft from the main drift. On tbo 2100 level the raise is up 19 ft, passing through vein formation carrying some quartz. On the 2400 level the joint consolidated east crosscut on the southern boundary has a total length of 190 ft. At the C & O shaft they have reached the 2300 station, and the set is being put in place. The bottom continues in vein material with some quartz.

CON. VIRGINIA.—During the past week 864 tons of ore have heen extracted from the 1550 and 1750 levels. On the 2000 level the joint Best & Belcher east crosscut has a total length of 250 ft. On the 2200 level the joint California east crosscut, on the northern boundary, is in 190 ft, and continues in vein material with streaks of quartz.

JULIA CON.—The south lateral drift on the 2000 level is in from the west crosscut 209 ft. They have 58 ft to drift to connect with the east crosscut, which is advancing on tbis level from the winze sunk from the 1850 level. Tue east crosscut from the winze is in 68 ft.

UTAH.—The incline is now 300 ft below tbo 1750 level and six ft below the 1050 level, on the slops. On tbo 1750 level the south lateral drift is in 255 ft. The east crosscut on this level is in 247 ft.

MEXICAN.—On the 2300 level the joint Ophir crosscut on the northern boundary is in 206 ft from the main north drift. The joint Union Con. crosscut on the northern houndary is in 224 ft from the main north drift.

SIERRA NEVADA.—The north drift on the 2300 level is in from the east shaft 594 ft. The crosscut east, at a point 500 ft north of the east shaft, was continued through the clay lining on the east side; total length of crosscut, 144 ft.

BELMONT DISTRICT.

BARCELONA CON.—*Courier*, Mar. 13: In tbe 75 level what was formerly supposed to be the footwall of the ledge was blasted into and a hody of rich chloride ore was found which assays from $135.07 to $2,190.24 per ton. The deposit seems to increase in size and value as the work progresses. This is the same character of ore which formerly milled $745.16 per tou.

SOUTH BARCELONA.—Latest assaye gave $175.93 and $182.11 per ton. The main tunnel when completed will drain the whole works 450 ft from the surface.

DANVILLE.—They have extracted a quantity of ore which assays $1,200 per ton.

JEFFERSON.—The fine ore body in the 700 level probably extends to the Prussian. A joint shaft on the Jefferson side of the mountain would cut the ledge at a depth of from 300 to 400 ft.

LIBERTY.—Is at San Antonio. After sinking 150 ft helow the fault and crosscutting 130 ft easterly, a fine vein of black sulphuret ore 10 ft thick was cut through.

BRISTOL DISTRICT.

HILLSIDE.—Pioche *Record*, Mar. 20: The fourth, fifth and sixth levels, east, are all in ore, the fifth level being in 200 ft from the main incline, carrying five ft of ore of the average assay value of from $40 to $70 per ton. The ore body west, in the main fissure, is carrying a good deal of high-grade ore. A crosscut into the hanging wall 40 ft opened up a four-ft vein of splendid yellow ore running high in silver. The winze sunk below the seventh level is in high-grade ore. Is shipping 25 tons of ore daily to this furnace.

ESMERALDA DISTRICT.

BELOINO.—*Herald*, Mar. 20: Is located at Candelaria; is an eastern extension of the Creolo, and runs in an easterly direction 1,500 ft. Tho company has two claima, tbe Palm Flush and the Side Issue. The width of the ground is 400 ft. A shaft has been sunk 80 ft, which cut a fair looking vein near the surface.

EUREKA DISTRICT.

RICHMOND.—*Sentinel*, Mar. 19: In the drift from the rise in the hack of No. 15 chamber the ore is narrow, hut the seam is regular. The 500 north from the hottom of No. 15 has heen drifted 40 ft, in very fine ore. The 500 west from No. 12 chamber is favorable for ore. No. 15 is opening out a very fine hody of ore; they have crosscut in the lower part of the chamber, and find the ore to he 30 ft wide, with ore still in the end of the crosscut.

BONANZA CON.—Is locatel southeast of the Jackson. The propert consists of four parallel locations, of 1,500 ft each, namely: the Star of the West, Nos. 1 and 2, and the Pride of the West, Nos. 1 and 2. The immense ore hodies of the Jackson are known to trend in the direction of the Bonanza Con. The ore also crops to the surface at several points within the consolidation. A main shaft is down 150 ft, from which point 300 ft of drift has been run, encountering the most encouraging prospects.

REBEL CREEK DISTRICT.

MINING ITEMS.—*Silver State*, Mar. 15: The incline on the Ohio mine is down 120. The ledge is from 10 to 14 ft wide, and tbo ore will average over $200 per ton. Among the other mines discovered aro the North Star, the Moonlight, the Columbus and the El Dorado, each and all of which carry good ores. Samples of the North Star assayed $100 per ton in silver. Mr. McKinney has a fine prospect near Buffalo station, on which the ledge is six ft wide and the ore assays from $50 to $100 per ton.

WINNEMUCCA DISTRICT.

BULLION BEE.—*Silver State*, Mar. 19: Samples taken from the ledge assayed $40.08 and $22.02 per ton in silver. The ledge is 30 ft wide, and the samplea assayed were an average of the ore.

ARIZONA.

OLOBE DISTRICT ITEMS.—*Silver Belt*, Mar. 13: An assay from the Lizzie Emier, Bluebird hill, gave 223 ounces to the ton. The McCormick crosscut at a depth of 250 ft is in vein matter 100 ft, 80 of which is pay ore. Mamie Miller, eight miles south of Globe, carries gold vein upwards of a foot wide, and assays from $50 to $300 per ton, has a 22-ft tunnel and 10-ft shaft. The Mahle, on same belt, is small, hut exceedingly rich in gold, has two veins, each varying from two to four inches. The Mattle Orr, nine miles south of Olohe, also a gold vein, assays $50 to $300, has a 40-ft tunnel and a 12-ft shaft. The vein is 12 inches wide. A four-ft hody of ore has heen developed in the Alhert Lea at a depth of 35 ft, all in ore assaying from 100 to 500 ounces.

OLOEN EAGLE.—Is located six miles from Globe. The first week's work, in one shaft, brought enough gold to pay all hands employed about the mine for 30 days, and in one day six tons of ore, assaying $130 to the ton in gold, were hoisted to the surface. The ore literally glistens with gold. The purchase money as well as the cost of labor on the mine has heen taken out within the last two months.

GOLDEN STAR.—Is situated on what is claimed to be the mother lode, which is traceahle and located for 7,500 ft. A year ago a combination tunnel was run hy the Golden Gate and Golden Star, which at the distance of 170 ft, struck the ledge at a depth of 120 ft, and it carried native gold in quartz. The last ore worked brought $52 in gold and $18 in silver.

EUREKA.—This claim adjoins the Golden Gate. The ore worked yielded $00 in gold and $20 in silver.

YELLOW METAL.—This property seems to carry off the palm for rich surface croppings, the same assaying $103 in gold and $44 in silver. A tunnel is heing run which will strike the ledge at a depth of 75 ft. It is already in 100 ft and will soon reach the vein.

MOUSER.—Several shafts have heen sunk, invariahly showing ore, which by dry-washing never fails to reveal grains of gold and assays $100 to the ton.

BELMONT.—*Citizen*, Mar. 20: This was the first mine opened in Patagonia district, having heen worked in 1865 and 1866. The shaft is down 115 ft, from which there are three crosscuts, at 40, 70 and 110 ft, running in the vein, 15, 20 and 35 ft respectively. The ledge contains free milling ore.

FINE SPECIMEN.—We were shown a rare specimen of white or clouded chloride of silver intermixed with horn silver, which was taken from the Ophir mine, in Empire district. They are down 28 ft on the ledge and have a vein eight ft wide, the seam from which the ore referred to came, heing from 6 to 10 inches wide.

COPPER DISCOVERIES.—Some very promising copper

CONTINUED ON PAGE 204,

Mineral Lands.

Proposed Change in the Manner of Locating.

The following is the full text of chapter XII, of the bill introduced into Congress by Mr. Converse, to provide for the survey and disposal of ths public lands of the United States. This chapter relates to the location of minsral lands, and is as follows:

Sec. 167. That the public lands of the United States, classified by law as mineral lands, shall bs reserved from sals or disposal, expect as expressly directed by law.

Sec. 168. That all valuable mineral deposits in puhlic lands of ths United States, both surveyed and unsurveyed, are hereby declared to be free and open to exploration, and surface and subterranean prospecting. The lends in which such mineral deposits are found shall be open to occupation and purchase by citizens of the United States, and those who have declared their intention to become such, upon the terms and conditions hereinafter prescribed.

Sec. 169. That any mining claims located after the —— day of ——, 1880, sball bs bounded as to surface by straight line, and all right to minerals contained therein shall be confined within vertical planes passing downward through said straight boundary lines.

Sec. 170. That a mining claim located after the——day of——may equal but shall not sxceed a square of——feet on the side, and the same may be in any shaps, so that neither length nor breadth shall exceed——feet, nor the aggregate area exceed that of the square hereinbefore first described.

Sec. 171. That proof of citizenship under this chapter may consist, in the case of an individual, of his own affidavit thereof; in the case of an association of persons unincorporated, of the affidavit of their anthorized agent, made on his own knowledge or upon information and belief; and in the case of a corporation organized nnder the laws of the United States, or of any State or Territory thereof, by the filing of a certified copy of their chartsr or certificate of incorporation.

Sec. 172. Tbat all future occupation, location or purchase of public mineral lands shall be governed by laws of Congress, to the exclusion of all local customs and regulations and State or Territorial laws.

Sec. 173. That no title, or valid claim to title, to public mineral lands eball be acquired as against the United States or third parties, except upon compliance with the following conditions and requirements.

Sec. 174. That any qnalified person may acquire such claim or title:

First—By marking the position of his claim by monuments upon the ground and by posting notices thereon. Said monuments shall consist either of firmly-set wooden stakes, not less than six inches square and not less than four feet above ground, or of well-set piles of stones, not less than four feet square at the bass and not less then three feet high, posted at each exterior angle of the claim. The northeasternmost monument shall be the initial point for description and survey, and shall be conspicuously marked "O." Said notices shall, within five days from the establishment of ths monuments, be posted conspicuously upon each of said monuments, and, in addition thereto, at least three of said notices shall be posted upon conspicuous places within the interior of said cleim. Said notices shall be dated with the establishment of said monnments, shall describe the exterior boundaries of the claim by specific reference to the monnments established on the ground, and shall note the approximate courses and distances passing southerly, westerly, northerly and eastwardly from the initial monument around the entire boundary closing upon said initial monument. A specific form of notice shall bs prescribed by the Commissioner of tbe General Land Office to embody the foregoing requirements, and be so explicit as to operate as notice to third parties.

Second—By the discovery within said claim of a lode, placer or other valuable mineral deposit, either before the posting of seid notics or within 90 days thereafter.

Third—Within ninety days from the posting of said notice, the locstor shall file with ths United States Surveyor-General for the surveying district in which the claim lies, a copy of said posted notices, together with proof of mineral discovery and an application for survey of his claim, and evidence that he bas deposited to the credit of the United States, in a proper United States depository, the sum of $50, which deposit shall be deemed an addition to the appropriation for the survey of the pnblic lands. Said proof shall consist of affidavits of the locator and of two disinterested persons, and the fact of said mineral discovery shall be subject to such further proof or verification as the Commissioner of the General Land Office may deem necessary. Said application shall be in writing, signed by the locator.

Fourth—Within one year from the approval by the United States Surveyor-General of said survey, the locator, his assigns or his duly authorized agent, has or have complied with the terms of this chapter, shall file in the proper land office an application for patent under oath, showing such compliance, together with a copy of the plat and field-notes of the claim, duly certified by the United States Surveyor-General, and proof that $500 worth of labor has been expended, or of improvements made upon the claim by the claimant or his grantors. Said proof shall consist of ths affidavits of the claimant or bis duly authorizsd agent, corroborated by tbs affidavits of two disinterested witnesses, which shall set forth ths facts in sufficient detail to satisfy the Commissioner of ths General Land Office that the said mineral claim has been worked in good faith. Upon the filing of the application and plat and making the above required proof, and npon payment to the proper officers of —— per acre in fnll for the acreage of his claim, the claimant shall be entitled to a patent for his said claim.

Sec. 175. That the right of assignment of a mineral claim after approval of survey by the United States Surveyor-Gensral is hereby expressly authorized, but such assignment shell confer no right as against the United States, and shall simply substitute an assignee in place of his grantors. No assignment prior to survey shall be recognized.

Sec. 176. That failure by a locator to make application for survey and satisfactorily prove the mineral discovery within 90 days after the posting of the notices shall subject his claim to location by any other qualified party.

Sec. 177. That failure of the claimant to make proof of work and payment within the time hereinbsfore prescribed, shall work a complete forfeiture of the claim, and the survey theretofore made shall be canceled.

Sec. 178. That on or before —, 1880, tbe Commissioner of the General Land Office shall divide the territory west of the 100th meridian into mineral districts, so that eech Surveyor-General's district shall bs made up of one or more mineral districts, having dne regard to the number of survsys of mineral claims and applications for the same.

Sec. 179. That the Surveyor-General shall:

First—Cause to be established in all mining neighborhoods or districts permanent neighborhood or district initial mineral monuments, whicb shall servs as initial refersnce points for mining-claim surveys, and which shall bs connected by trigonometrical measurement with mineral base lines, to be established and meesured by snch methods as may bs prescribed by law.

Second—Hs shall cause to bs determined by trigonometrical measurement the exect course and distsnce bstween said initial district mineral monuments and the hereinbefore-described initial claim monuments.

Third—He shall receive, place on file, and record, in a book kept in his office for that purpose, every application for the survey of a mining claim, together with ths original location notice of the claimant.

Fourth—When two or more locators make application to a Surveyor-General for the survey of the same tract, either in whole or in part, and neither survey has heretofore been epproved, the right to approval shall be in him who mede the first location on the ground; and such priority of location shall, in the first instance, be determined by the officer in the field, and any party aggrieved thereby may, within ninety days after such determination, appeal to the United Stetes Surveyor-General, by whom the question mey be reviewed, upon notice to ths appellee, and after reasonable opportunity for the introduction of proof by both parties.

Fifth—He shall cause some duly appointed deputy mineral surveyor, chosen by the applicant for survey, to execute a survey of each claim for which an application is filed in his office, and to return the plat and field-notes of seid survey to his office.

Sixth—He shall keep in his office connected maps of all mining neighborhoods in his district, upon which shall be shown ths positions of all mineral monuments and the relations to leading topographical features in their immediate vicinity, and the positions of all snrveyed claims which do not overlap previously snrveyed claims, numbering said surveys consecutively in the order of the return of plats and field notes by deputy mineral surveyors. Hs shall ascertain in whatever mode he shall deem most practicable the location of all mining cleims hsretofore surveyed or patented and shall delineete the same upon the connected district maps as accurately as possible. On the return of the said plats and field notes by the deputy mineral surveyor, the Surveyor-General, having cansed the trigonometrical measurement as hereinbefore provided to be made between the nearest initial district mineral monument and the initial monument of the mining claim, shall apply said mineral-claim survey to his district map, and, provided said claim or any part thereof does not overlap any previously applied plat and is otherwise correct, he shall approve said survey and within ten days thereafter shall delineate it upon said district map and make two full copies of said plat and field notes, forwarding one to the Commissioner of tlie General Land Office and the other to the Register of the proper land office. Said district map shall be open to examination by ths public. Copies of all approved surveys shall be furnished to interested parties on payment of costs as fixed by the Commissioner of the General Land Office. If the said Surveyor-General applies any duly returned plat to said district maps, and said plat is found to conflict with or overlap a previously approved survey, said Surveyor-General shall withhold approval thereof, and no legal effect shall attach to the same by reason of its having been made in the field, nor by reason of any approval thereof if the same should inadvertently or accidentally be approved in conflict with prior approval.

Sec. 180. That it shall be ths duty of each Surveyor-General within whose surveying district any minsral survsys have been or shall be made, and within 30 days after sxpiration of ths 10 daye abovs msntioned, to furnish frss of cost, to each district land office and to the Recorder of each county, certified copies of such of said connecting maps as may embracs lands within the limits of said land district or within seid counties, respectively; and copies shall also bs furnished to deputy mineral surveyors at the discretion of the said Surveyor-General.

Sec. 181. That within 30 days after approval of any subsequent survey it shall be ths duty of each Surveyor-General to furnish to each district land offics and to the several County Recordsrs a certified copy of sucb of said subsequent surveys as may fall within said land district and counties, respectively; and the district land offices shall forthwith cause said survey to be immediately delineated in its proper position upon the connecting maps theretofors furnished them.

Sec. 182. That each of said connecting maps shall show in a merginal table the date of approval of the several surveys delineated thereon, and said marginal table shall be regularly continued as subsequent snrveys are added to said connecting maps. Each copy hereinbefore provided for shell also exhibit ths exact date of such approval or approvals.

Sec. 183. Thet in the event that proof of bona fide development and payment of purchasemoney shall not be made or tendered within the year heretofore prescribed, it shall be the duty of the Register of the proper land office to notify the Commissioner of the General Land Offics, who shall forwith cause said survsy to be canceled in all the offices nnder his control, and shall cause notice thereof to be sent to the Recorder of the county wherein the canceled survey was situate. After said cancellation no right or claim of any character shall survive in any party by reason of said survey, and the land embraced therein shall be subject to the claim of any intervening or subsequsnt party, as if no such survey bad ever been mads or applied for.

Sec. 184. That copies of seid connecting meps shall also be furnished to the Commissioner of the General Lend Office, who shall cause the same to be continuously perfected, as hereinbefore prescribed as to other offices.

Sec. 185. That if any Surveyor-Gensral willfully or negligently omits to promptly perform the duties prescribed in this chapter, it shall bs considersd sufficisnt cause for his dismissal from office.

Sec. 186. That if at any time after application for survey, and prior to application for patent, it shall be proved, after personal notice to the mineral claiment, to the satisfaction of the Register of tbe propsr land district, tbat said claimant hes left his surveyed claim with intention of not complying with the provisions of this chapter, the right of said claimant shall cease and determine, after notice in the usual form, to the claimant of said decision by the District Register; and in the absence of appeal to the Commissioner of the General Land Office, the latter officer shall canse the cancellation of ths said survey, as hereinbefore provided.

Sec. 187. That the Surveyor-Generals of the United States may appoint in their respective districts as meny competent snrveyors, furnishing satisfactory evidence of professional capecity, and giving bond in the penal sum of $10,000, as shall apply for appointment to survey mineral cleims. The expense of surveying claims shall be paid by the epplicants, and they shall he at liberty to obtain the seme at the most reasoneble rates; and they shall also be at liberty to employ any United States Deputy Surveyor to make the snrvey.

Sec. 188. That the Commissioner of the General Land Office ehall also have power to establish the maximnm of charges for surveying, and any deputy surveyor proved to have exceeded this maximum shall forfeit his commission, and shall not thereafter be eligible for appointment.

Sec. 189. That all affidavits rsquired to be meds under this chapter may be verified before any jndge or clerk of a court of record, or bsfore any officer authorized to administer oaths, whose official capacity shall be properly verified; and all testimony and proofs may be taken before any such officer, and when duly certified by the officer taking the seme shall have the same force and effect as if taken before the Register of the land office. In cases of contest as to the mineral or agricultural character of the land, the testimony and proofs may be taken as herein provided, on personal notice of at least 10 days to the opposing party, or if sucb party cannot be found, then by the publication of at least once a week for 30 days in a newspaper to be designated by the Register of the land office as published nearest to the location of sucb land, and the Register shall require proof that such notice has been given.

Sec. 190. That all rights wbich have attached to mining claims under previous acts of Congress, shall not be affected by the operations of this chapter: Provided, That where such claims have not been or shall not within one year thereafter be consummated by ths required payment of purchase money, snch unconsummated claims shall lapse, and the land embraced tberein shall thereafter he subject only to the operations of this chapter.

Sec. 191. That where land is used or occupied by the proprietor of a mining claim for mining or mill purposes, such land may be embraced and included in an application for a patsnt for such mining claim, and ths same may be patented therewith, subject to the same preliminary requirements as to survey and notice as are applicable to mineral claims; but no location hereafter made of such mill site shall exceed five acres, and the same mnst be paid for at the same rate as fixed by this chapter for ths superficies of the minsral claim. The owner of reduction works, not owning a mins in connection therewith, may also receive a patsnt for his mill site as provided in this section.

Sec. 192. That as a condition of sale, in tbs absence of necessary legisletion by Congress, the local Legislature of any Stete or Territory may provide rules for working mines, involving easements, drainage and other necessary meens to their complete development; and this condition shall be fully expressed in the patent.

Sec. 193. That whenever, by priority of possession, rights to ths use of water for mining, agricultural, manufacturing, or other purposes, have vested and accrued, and the same are recognized and acknowledged by the local customs, laws and ths decisions of courts, the possessors and owners of such vested rights shall be maintained and protected in the same, and the right of way for the construction of ditches and canals for the purposes herein specified is acknowledge and confirmed: but whenever any person, in the construction of any ditch or canal, injures or damages the possession of any settler on the public domain, the party committing such injury or damage shall be liable to the party injured for such injury or damage.

Sec. 194. That all patents granted, or prsemption or homesteads allowed, shall be subject to any vested and accrued water rights, or rights to ditches and reservoirs used in connection with such water rights, as may have been acquired under or recognized by the preceding section.

Sec. 195. That wherever, upon ths lands heretofore improperly designated as mineral lands, which have been excluded from survey or sale, thers bave been homesteads made by citizens of the United States, or persons who havs declared their intention to become citizens, whicb homesteads have been made, improvsd, and used for agricultural purposes, and upon which thers bave been no valuable mines of gold, silver, cinnabar, lead, coppsr, coal, iron, or other valuable deposit discovered, and which are properly agricultural lends, the settlers or owners of such homesteeds shall have a right to avail themselves of the provisions of chapter sixth of this title, relating to homesteads.

Sec. 196. Upon the survey of the lands described in the prsceding section, the Secretary of the Interior may designate and sst apart such portions of the seme as are clearly agricultural lands, whicb lands shall thereafter be subject to homestead and sale as other publio lands, and be subject to all the laws and regulations applicable to tbs same.

Sec. 197. That the President is autborizsd to establish additional land districts, and to appoint the necessery officers under existing laws, wherever he may deem the same necessary for tbe public convenience in executing the provisions of this chepter.

Sec. 198. That the provisions of the precsding sections of this chapter shall not apply to the minsral lands situated in the States of Michigan, Wisconsin and Minnesota, which are declared free and opsn to exploration and purchase, according to legal subdivision, in liks manner as before the 10th day of May, 1872. And any bona fide entries of such lands within the Stetes named, since the 10th day of May, 1872, may be patented without reference to any of the foregoing provisions of this chapter. Such lands shall be offered for public sale, in the same manner, at the same minimum price, and under the same rights of pre-emption as other publio lands.

Sec. 199. Thet no act passed by Congress, granting lands to States or corporations to aid in the construction of roads or for other purposes, or to extend the time of such grants, shall be so construed as to embrace mineral lands, which, in all cases, are reserved exclusively to the United States, unless otherwise specially provided in the act or acts making the grant.

Sec. 200. That Section 2323 of the Revissd Statutes of the United States, relating to tunnel rights, is hereby repealed.

Sec. 201. That every person above the age of 21 years, who is a citizen of the United States, or who has declared his intention to become such, or any association of persons severally qnalified as above, shall, upon application to the Register of the proper land office, have the right to snter, hy legal subdivisions in a compact body, any quantity of vacant public lands of the United States containing coal and iron valuable for domestic or commercial purposes, not exceeding 320 acres, and not otherwiae appropriated or reserved by competent authority, upon payment to tbe Register of not less than $10 per acre for snch lands.

Sec. 202. That where any snch person or association of persons shall have opened or improved any coal or iron mine upon nnsurvsyed public lands, and shall be in actual possession of the same, such person or association shall bs entitlsd, after snrvey, to a preference right of entry of such lands: Provided, that said entry shall be effected within 60 days after publication of notice of return of the towuship plat to the district land office.

Sec. 203. That the two preceding sections shall be held to authorize only one entry by the same person or association of persons; and no association of persons, any member of which shall have taken the benefit of such sections either as an individual or as a member of any other association, shall hold or enter any other lands nnder the provisions thereof; and no member of any association wbich shall have taken the benefit of such sectione shall enter or hold any other lands under their provisions.

Sec. 204. That in cass of conflicting claims

for the purchase of coal or iron lands, where the right of either party was initiated when the lands were unsurveyed, priority of possession and improvement, followed by continuous and bona fide occupation, shall determine the preference right to purchase; but joint purchase shall be allowable on consent of the parties, or when, in the judgment of the Commissioner of the General Land Office, the conflict was created without notice of any prior claim.

SEC. 205. That nothing in the four preceding sections shall be construed to destroy or impair any rights which may have attached prior to the passage of this act, or to authorize the sale of lands valuable for mines of gold, silver or copper. The Commissioner of the General Land Office is authorized to issue all needful rules and regulations for carrying into effect the provisions of this and the four preceding sections.

THE ENGINEER.

The Piercing of the St. Gothard.

One of the great engineering works of the present century, the piercing of a second great tunnel through the Alps, was carried to a successful issue on the 29th of February, when the workmen from the two ends of the excavations under the St. Gothard were able to shake hands with one another miles away from the surface of the earth. Modern progress in engineering science has stripped such enterprises of much of their uncertainty, and therefore the conception of works like the St. Gothard tunnel appears to us now a matter hardly deserving particular attention. When, however, between 1850 and 1860, an Italian and a Swiss engineer, Locchini and Meuller, first examined the topography of the St. Gothard, and reached the conclusion that the undertaking was practicable, their statements were received with much doubt. Their work was continued by Wetli, and later, in 1863, Dr. A. Escher, prominently connected with the Swiss railroad system, caused more extended and elaborate technical and financial examinations to be made by engineers, whose labors resulted in the recommendation of a tunnel between Airolo, on the Italian side, and Goeschenen, on the Swiss side.

Early in the spring of 1872 bids for the execution of the tunnel were called for. Seven in all were received, of which two only were seriously considered—one made on the part of an Italian company, the other coming from M. Lonis Favre, of Geneva. The latter was accepted on the 7th of August, 1872. It was somewhat modified during the years following, so that the contract price rose to $9,700,000, the time for completion being limited to eight years. The advance heading of the tunnel is all that has been cut through up to this time; the other portions of the work are still considerably behind. As in all large tunnels, the work in the St. Gothard advances in sections. Following the Belgian system, a heading near the top of the arch is driven in advance, and this is followed further back by an enlargement to both sides, bringing out the full section of the upper part of the tunnel. The lower bench is then proceeded with in a similar manner. The tunnel section was thus taken out in two levels at the Goeschenen side, while at the Airolo side three were found to be necessary. Excavation is followed by timbering, and this is succeeded by the arching, so that, entering the tunnel at one portal, each stage is successively passed through.

The dimensions of the St. Gothard tunnel are large enough to accommodate a double track of standard gauge, the width at the level of the sleepers being 24.93 feet, and the hight 19.68 feet. The total length, when completed, will be 9.26 miles—considerable more, therefore, than either the Mont Cenis, the Hoosac, or the Sntro. Although the tunnel passed through hard ground throughout, and at the Airolo end through a wet and difficult formation, its cost was considerably less than that of earlier works of the same kind, owing, to a certain extent, to improved methods of excavation, which also largely reduced the time. The Mont Cenis tunnel, which may best serve to show the advance of modern tunnel work—because cost of labor, etc., were not so widely different—cost $15,000,000, and required thirteen years, while the Hoosac cost $13,000,000, and took eleven years from the time when work was properly begun. It should not be forgotten, in the case of the latter work, that the cost of labor, machinery and materials is vastly greater that it is in the cass of the European enterprises cited.

Among the chief engineering features adopted in the construction of the St. Gothard was the use, almost from the outstart, of rock-drilling by machinery and blasting with high explosives. Experience at the St. Gothard has contributed much toward the introduction of power drills, by the aid of which a monthly advance of from 400 to 440 feet was reached, in rock composed chiefly of granitic gneiss and various granitic and micaceous schists.

The commercial importance of this great work for central Europe cannot be overestimated, while for Switzerland its completion has become a question of vital importance, the piercing of Mont Cenis having diverted much of the traffic to French roads. The St. Gothard railway forms the shortest line of transit between the Mediterranean and the valley of the Rhine, and will be one of the greatest arteries of trade of the Continent, carrying all the transportation and travel between Italy and Switzerland, northeastern France, western and central Germany and northern Europe. It will probably carry the great East India mail between Great Britain and her Eastern Empire *via* Brindisi, Italy and the Suez canal. Two of the great Alpine passes have thus been superseded by the work of modern engineering, and it is only a question of time when Austria will follow the lead of her neighbors and commence the work of piercing the Simplon.

USEFUL INFORMATION.

The Iron of Antiquity.

Soon after the arrival in New York of a specimen of the iron found under the pedestal of the obelisk of Alexandria, the specimen was forwarded to Mr. Alexander L. Holley, with a request that he would report upon the character of the metal and the probable method of its manufacture. Mr. H. who, by the way, is an engineer of very high rank, reports as follows:

The specimen was too small for any physical test whatever. A clean fracture revealed to the expert eye a tough-looking metal, not unlike what is called puddled steel.

I sent the specimen to Dr. Wendel, the able chemist of the Albany & Rensselaer Iron and Steel Works, who took such an interest in the matter that he made the following very complete analysis:

Iron	98.788
Carbon	0.521
Sulphur	0.009
Silicon	0.017
Phosphorus	0.048
Manganese	0.110
Nickel } Cobalt }	0.079
Copper	0.102
Calcium	0.218
Magnesium	0.028
Aluminium	0.070
Slag	0.150
Total	100.090

If we had not known from the general history of the iron manufacture that the specimen must have been made by the Catalan process, the analysis would have so indicated. The notable facts are: About half a per cent. of carbon, giving the hardness of ordinary rail steel; very low silicon and phosphorus, due to the method of manufacture, and a remarkably large amount of calcium, indicating the plentiful use of lime as a flux in the process. The small amount of slag (for a Catalan product), as well as the fine fracture, indicate frequent reworking.

The Catalan process is simply subjecting to a high red heat pulverized iron ore mixed with charcoal, enough to combine with its oxygen. The product is a pasty mass of iron which is substantially pure chemically, excepting the little carbon it has got out of the fuel, but which is mechanically mixed with silica, phosphate of lime, alumina and other impurities the ore had. By repeatedly beating the mass to a plastic condition and hammering it, this dirt is pretty well expelled, and the product, although costly, is excellent wrought iron. This process is still in use where ore and charcoal are very cheap, but the modern soft steels have almost displaced it as a material for boiler plate and other fine products. Yet, curiously enough, as Catalan iron is supplanted by steel, the Catalan process is coming into still greater use to furnish material for open-hearth steel. The pasty mass above described quickly melts in the cast-iron bath of the open-hearth furnace, and mechanical impurities float off as slag. Dr. Siemens' modern improvement of the Catalan process—performing it in a steam-rotated regenerative gas furnace, and on a very large scale—produces so cheaply that it is likely to furnish most of the material for fine open-hearth steel. Thus, the prehistoric method, facilitated by modern engineering, is coming again to the front.

Changes of Flour in Becoming Bread.

In popular use we employ the word "bread" to qualify loaves which are served in slices. The rolls are much smaller. Both consist alike of crumb and crust. The crumb is made up of a multitude of cells of thin walls containing carbonic acid gas, the product of fermentation in the dough. These walls of the cells contain both gluten and starch, and traces of dextrine and sugar. As a consequence of the treatment of water and the application of heat, the starch grains, which, in their normal condition, are little sacks filled with minute granules of starch proper, have been swollen and burst. Starch similarly treated by itself, as in the preparation for stiffening linen in the laundry, when dried in a thin layer upon glass plate, for example, is transparent, and presents a glazed surface. When this glazed material is removed with a knife blade, it is seen to be stiff and horny. The gluten, which is mixed with it in the crumb of bread, and which may be conceived to be continuous, however thin throughout the wall of the cell, has been, by the process of baking, dehydrated; that is, the heat to which it has been subjected has driven out a certain amount of water, which chemically sustains something like the same relation to the gluten from which it has been expelled that the water expelled by heat from alum-crystals sustains to the original body of alum. This is the condition of the gluten from the crumb in the interior of the loaf at the instant of its removal from the oven. On drying, it abstracts the water from the starch with which it is coated, or intimately mixed, as the roasted alum absorbs the water that is sprinkled upon it. The starch, by this process, being dried and stiffened, gives its support to the walls of the cell, and renders the texture of the staff loaf more firm than that of the fresh loaf.—*Prof. Horsford.*

Zincography for Amateurs.

In a recent paper read before the London Society of Arts, Mr. Thomas Bolas, F. C. S., described zincography as a simple and easy mode of printing in the following fashion: Zincography, he said, is similar to lithography, except that a zinc plate is employed in the place of the lithographic stone. The so-called transfer paper is merely a moderately fine paper which has been brushed over, on one side, with a mucilaginous mixture, prepared by boiling together the following: Water, 1,000 parts; starch, 100 parts; gamboge, 6 parts; glue 1 part. This paper is written upon with the ordinary commercial lithographic writing ink, which has been rubbed up with water like an artist's water color. The writing being dry, it is necessary to moisten somewhat the back of the transfer by means of a damp sponge; after which it is laid face downward on a sheet of ordinary roofing zinc, which has been previously cleaned by means of emery cloth. Both being now passed together under the roller of a small press, the transfer adheres to the metal plate; but on damping the back of the paper it becomes easily removable, leaving the writing on the zinc. The face of the zinc plate is now gently rubbed over with mucilage of gum arabic, which is all the better for being slightly sour, and the excess of gum having been sponged off, an India rubber inking roller charged with ordinary printer's ink, is passed over the still damp zinc plate a few times. The ink takes only on the lines of the transferred writing, and it is merely necessary to lay a sheet of white paper on the plate and to pass both through the press to obtain an impression—an exact reproduction of the original writing. Any number of copies can be printed by repeating the operations of damping and inking. The zincographic process, thus simplified, is rapid, economical and within the reach of every one.

KEEP THE FARM TOOLS SHARP.—The *Germantown Telegraph* gives the following seasonable and sensible hints on the sharpening of tools: "Too often these things are not thought of until the articles are wanted, when much valuable time is lost in putting in order what might as well have been done during the dull winter days. It has been computed that the same man can do as much in two days with a sharp scythe as in three days with one comparatively dull and the same expenditure in force. And it is just the same in regard to all other tools or implements, whether operated by hand, steam or horse power. The engineer continually oils the machinery, and a good saw or file is oil to hand implements. We know one who has a great deal of hand heeing to do by hired labor, and he believes that the continued use of the file on the hoes makes a difference of nearly one-half in the labor. His calculation is that every 10-cent file he buys saves him $10 in his laborers' hills. A good grindstone and a set of files are among the best of farm investments. The best of all forehandedness is that which prepares in advance a full set of good and well-repaired tools to work with.

PRESERVING FLOWERS.—The flowers must be carefully surrounded by perfectly dry, fine sand, in such a manner that they will hold their form, the pressure of the sand upon all surfaces being alike. Any fine clean sand will answer; it should be sifted to remove all coarse particles, and then washed in successive waters until dust and all earthy and clayey matters are washed away, and the last waters when poured off are perfectly clear. The sand is then to be dried and then to be placed over a fire in a proper vessel, until quite hot, hotter than the hand can bear, and when cool it will be fit to use. After heating, it should be used at once, before it can absorb moisture from the air. Good results have been obtained by taking a clean, thoroughly dry flower-pot, the hole in the bottom of which was stopped by a cork. This was filled a third full of the dry sand, the flowers set carefully in the sand, and then more sand slowly added, so as to surround and cover the flowers inside and out, and set in a warm place. At the end of 24 hours, the cork was removed from the hole in the flower-pot, and the sand allowed to run out in a small and gentle stream. The flowers were left in the pot, perfectly dry.

TRIANGLES.—We do not recollect of having ever seen any rule for obtaining the length of side of an equilateral triangle of known area. Although a simple problem, and perhaps of but occasional use, we have arranged a convenient rule for its solution. To obtain the length of side of an equilateral triangle, the area being given, multiply the area by .57735, and take twice the square root of the product for the length of side. A line bisecting an angle and equally dividing the area of an equilateral triangle, in other words, a perpendicular raised midway of the base, is .866025 of a side.—*Exchange.*

GOOD HEALTH.

Why Teeth Decay.

Upon a careful review of the opinion and experiments of our best investigators, says Doctor S. M. Prothro, in a paper read before the Tennessee Dental Association, it is conclusive that there are but two active agents in the process of dental caries, namely the action of acids and the development of a vegetable parasite, *Leptothrix buccalis*. By actual experiments it is demonstrated that it does not require strong acids to separate the phosphoric and carbonic acids from the lime contained in the tooth substances. Even water that contains carbonic acid will dissolve the calcareous salts. And it seems from a circumstance that transpired under the eye of Mr. Spence Bats, that water alone can dissolve the teeth.

A lady having two sets of artificial human teeth, placed one set in water to preserve it till she had worn out the other. At the expiration of seven years, the set that she had kept in the water was as much corroded as the one she had worn in her mouth. This case corroborates a statement made by Wedl and Heider, that at the end of ten days fungi had attacked the enamel and dentine of the teeth that had been kept in pure water, and that in a few weeks the tissues were pierced with holes like a sieve.

All mineral, as well as vegetable acids, act promptly upon the teeth. "In forty-eight hours acetic, citric and malic acids will corrode the enamel so that you may scrape a great portion of it away with the finger-nail." Acid tartrate of lime, having a greater affinity for the lime of the tooth than for its own base, will rapidly destroy the enamel.

Grapes in forty-eight hours, will render the enamel of a chalky consistence. Vegetable substances are inert till fermentation takes place and acetic acid is formed. Sugar has no deleterious effect, only in the state of acetous fermentation. Animal substances exert no injurious effect until putrefaction is far advanced.

Novel Mode of Preserving a Man's Reason.

A curious story is going the rounds of the English newspapers of an exhibition in the show windows of one of the leading jewelers of Vienna. The object of attraction is a brooch magnificently studded with gems, in the middle of whose chasing is inclosed the most singular of centers—four common, old, bent and corroded pins. This brooch is the property of the Countess Lavetskofy. The pins have a history, of course. Seven years ago Count Robert Lavetskofy, as the story runs, was arrested at Warsaw for an alleged insult to the Russian Government. The real author of the insult, which consisted of some careless words spoken at a social gathering, was his wife. He accepted the accusation, however, and was sent to prison.

In one of these lightless dungeons in which the Czar is said to be fond of confining his Polish subjects, the unfortunate martyr for his wife's loose tongue spent six years. He had only one amusement. After he had been searched and thrown into a cell, he had found in his coat four pins. These he pulled out and threw on the floor; then in the darkness he hunted for them. Having found them, perhaps after hours and even days, he scattered them again. And so the game went on for six weary years. "But for them," he writes in his memoirs, "I would have gone mad. They provided me with a purpose. So long as I had them to search for, I had something to do. When the decree for my liberation as an exile was brought to me, the jailer found me on my knees hunting for one which had escaped me for two days. They saved my wife's husband from lunacy. My wife, therefore, could not desire a prouder ornament."

THE TRANSMISSION OF SCARLET FEVER BY MILK.—A report has been issued by the Local Government Board on a sudden outbreak of scarlet fever at Fallowfield, near Manchester, England. The outbreak included 35 persons, belonging to 18 families, and of the individuals who suffered, not less than 24 were attacked within 36 hours, between Sunday morning and Monday evening. Dr. Airy was directed by the Local Government Board to investigate this outbreak, and the results of his investigation are, says the *Lancet*, given in the report now before us. The outbreak was quite local, and the different details elicited tended to the general result that the infection had been distributed to the families through the agency of a particular milk supply. The facts bearing on this point do not well admit of any other interpretation. The question of the mode in which the milk could have become infected was not so fully cleared up, but it is shown that one of the milkers on the dairy-farm lodged in a farm house where scarlet fever was present at the time when the milk presumably became infected, and it is suggested that the infection was communicated to the milk, in some way undetermined but not inconceivable, through his agency. The report throughout is of very considerable interest, and forms an important contribution to our knowledge of the *mechanism*, if we may so write, of certain of the observed phenomena marking the progress of infectious diseases.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, March 27, 1880.

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The Week.

We are in the midst of another rain storm, which gives certainty to the fullness of the approaching harvest, and awakens hopes to the miners of a plentiful supply of water for the advancement of their operations. Our merchants and manufacturers are anticipating a prosperous season, and confidence is being rapidly restored. A more healthy tone already exists in business circles, and the near future is replete with promise of brighter and better times. It does appear as if the gloom and despondency which has for so long a period clouded all classes of the community is passing away. The San Francisco *Journal of Commerce* publishes interviews with over 100 merchants in every line of trade in the city, and all express a hopeful feeling that the hardest of the times are past, and that the prospects for business of the year are good.

A matter of considerable importance to California interests has transpired in Washington this week, in the appointment of a commission to China to amend the treaty or make a new one. This is referred to more at length in another column.

One of the great events of the week in industrial circles was the coming of De Lesseps in the interest of his Panama canal enterprise. He promises the speedy realization of his project. One thing seems assured, his brisk promotion of the idea will lead to carrying through a ditch some where down there, whether it be on his line or not, and that will bring us many weeks nearer to the great markets of the Atlantic coasts.

MINING DEBRIS IN CONGRESS.—The telegrams from Washington inform us that the House Committee on Mines and Mining have authorized Barry to report, with a recommendation for passage, a bill appropriating $250,000, to be forthwith expended, under direction of the Secretary of War, in the most efficacious manner, to preserve the navigable waters of California from injury from deposits of mining debris, and also to defray the expenses of further investigation of the whole subject by a commission, to consist of two Army engineers and one officer of the Coast Survey. This is in accordance with the recommendation of Col. Mendell, whose report we published in our last issue.

Hydraulic Mining in California.

The incoming season bids fair to be a very busy one with the placer miners of California, especially with those engaged in the hydraulic branch of the business. In the first place there is likely to be an abundance of water, while there is almost sure to ensue a considerable expansion of this class of operations. In the more central mining counties several of the older companies will, through the construction of deep drain tunnels, obtain an increase of their water supply or, of their other aids of production, materially enlarge the yield of their mines, while a number of new companies will here for the first time get to work. But it is in the more northwesterly counties of the State that this industry will the coming year show the greatest activity as well as the largest gains, for the reason that the field there is extensive and the business comparatively new, while the facilities for prosecuting it to advantage are of a superior kind. The deposits of hydraulic gravel in that section of the State are large, and apt to be of high grade. Water is in good supply, and can be a general thing be introduced upon the mines at small cost. There is little trouble there about outlet and none as regards the disposition of the tailings, from which there is no interest exposed to be harmed. Encouraged by these favorable conditions, a good deal of capital has been invested in the hydraulic mines of Trinity county within the past few years, and latterly some little also in Siskiyou and Del Norte counties.

Some of the enterprises inaugurated in Trinity county have been on an extended scale, the quantity of water and the extent of ground secured by most of the companies who have lately started in there having been large beyond precedent. The landed possessions of the Buckeye company, located on the high ridge bearing that name, embraces something like a thousand acres of ground; the amount of water claimed by them being also very large. The gold-bearing gravel lands of the Trinity, formerly the Weaverville Ditch and Hydraulic mining company, comprise 2,872 acres, their water rights covering somewhere about 20,000 miners' inches of water. A portion of this water has already been introduced upon their claims, which are well outfitted and being operated in an efficient way. Notwithstanding the extent of their ground, much the larger portion of it is rich in gold. The Taylor Flat property, now nearly ready for active operations, crosses some exceedingly rich gravel deposits, with a first right to the entire flow of French creek, which carries never less than three thousand, and for two-thirds of the year as much as six or seven thousand inches of water; while of the Dutton creek property very nearly the same may be said, the quantity of water being here somewhat less. The ditch projected for bringing the waters of the North Fork of the Trinity upon the mines lying along the main river, will carry not less than 5,000 inches of water. Messrs. Watson, La Grange and Gibson, who are already largely interested in a number of valuable properties on Trinity river, are moving in the matter of conveying the entire flow of New River—a large tributary of the Lower Trinity—upon Hawkin's Bar, a rich and extensive deposit of gravel, situate near the junction of these two streams. As coadjutor in this enterprise, these gentlemen have Walter Scranton, of the great iron manufacturing family of Scranton, Pa. The same parties having purchased the Willehire gravel mine on Trinity river, with accompanying water-rights, will, through the enlargement of the present ditches and washing apparatus, increase the productive capacity of the property many fold.

In point of magnitude, however, the properties and franchises of the Trinity River Canal and Hydraulic mining company overshadow those belonging to any other company in Trinity county, or perhaps in the State, the landed possessions going with this one ownership comprising 36 separate mining locations, the whole aggregating 3,707 acres, while the water franchises appurtenant thereto cover a first right to the entire flow of Coffee creek, the main Trinity and its East Fork, Eagle creek and several other streams in the vicinity, the aggregate flow of which is never less than 20,000 and for seven or eight months in the year amounts to as much as 60,000 inches of water. The whole of this water it is intended shall ultimately be diverted from its present channels and be employed for mining purposes, a considerable portion of the canals necessary to that end having been already constructed. The expenditures made on this property to date amount probably to $200,000, all the tools and supplies requisite for the employment of a large working force having been furnished, some of the claims having been opened and partially equipped, with some apparatus in place and more on the ground, besides much canal construction accomplished. As the auriferous lands embraced within the limits of this estate have, under very extensive workings shown themselves to be among the most prolific in Trinity county, there is little doubt but this enterprise if properly carried out will eventuate in a great success. There is hardly another mining estate in California that possesses such capabilities as this. To fully utilize its resources will, however, require some time and no inconsiderable means.

As regards extent of mineral lands there is but one company on the coast, the Mammoth Blue Gravel, on Chalk Bluff, Nevada county, that owns a larger area than this Trinity River company, the claims of the former, a large proportion of it patented, covering nearly 12,000 acres. In the matter of water supply, however, this company is much behind that in Trinity county. As their deposits consist mainly of drift diggings, this deficiency is not at all vital nor yet very important, there being here enough water for washing the gravel extracted by drifting, with some also for hydraulic operations. This is a valuable estate and requires only a small amount of working capital to insure for it an immediate, large and profitable production, as it is traversed from end to end by the old river channel that in times past enriched Red Dog and You Bet at its lower end, and several famous camps situated along it higher up. The property is to be thoroughly outfitted and vigorously worked the coming summer. Various other examples might be cited in evidence of the healthful condition of hydraulic mining in California and illustrative of its steady progress as well as its tendency to expansion.

Proposed Changes in the Mining Laws.

In view of the great interest taken by the mining community in the matter of the proposed changes by Congress in the mining laws, we have endeavored to obtain as full opinions as possible from various sources for the purpose of ventilating the subject. In pursuance of this object we propounded a series of questions to Mr. W. A. Skidmore, which we append with the answers furnished by that gentleman. Mr. Skidmore is Secretary of the California Miners' Association, and was for several years deputy in this State for the U. S. Mining Commissioner, R. W. Raymond. His acquaintance with the miners of this coast is thorough, and he is the author of a work on mining law. Nearly all the material relating to California mines in Raymond's report was written by Mr. Skidmore, who has visited nearly every camp on the coast. His familiarity with the subject renders his opinion on these proposed changes worthy of attention and respect. The questions propounded to Mr. Skidmore were as follows:

Among the first eight sections of the mining bill now before Congress, it is provided:

1. That a mining claim shall be 1,500 feet in length on the line of the ledge by 600 feet in width.

2. That the locator shall not follow the dip of his ledge beyond the point where it is intersected by the surface boundary, drawn down vertically.

3. The locator shall be allowed one year after making the location to discover minerals.

4. Requires the locator, within 90 days after making his location, to have his claim surveyed by a deputy U. S. Surveyor, and a plat of the same filed with the Surveyor-General of the State or Territory.

In consideration of the foregoing, and as a matter of information for the benefit of the class of men who do the prospecting and locating of mines, we solicit your opinion on the following questions:

1. In the boundaries of a mining claim, as fixed by this bill, what would be the average depth at which ore bodies, in their varied angles of inclination downward, would pass outside of the 300-foot boundary line?

2. How many parallel side locations would there, on an average, be required to secure the ownership of the ledge to a depth of 2,000 feet?

3. In a majority of instances, would the average depth at which the ledge would pass outside of the 300-foot boundary, be more than sufficient to determine the character and value of the mine?

4. In the event of the locator being unable to secure the continuation of his lode, in its dip down and beyond the point where it passes outside of the 300-foot boundary, would you consider the mine of any practical or permanent value, and would capital invest in expensive hoisting and reduction works on such a mine?

5. Would the average depth at which the ledge in its dip would pass outside of the 300-foot boundary line be at a point on the ledge above or below water level? and, as a general rule, does the water-level line mark a change in the permanent character and value of the mine?

6. Would not the provision allowing one year after making the location to discover mineral (vein matter) be detrimental to mining interests? and would this provision subserve any other purpose than that of blackmailing and effectually robbing the original locator of his mine?

7. Under the provision requiring a survey of a claim would it—in the case of discoveries made hundreds of miles remote from communication by water or rail—be practical, even if possible, for the locator to take a deputy U. S. Surveyor on the ground and do the work required within the allotted time of 90 days? And furthermore, what would be the per diem cost for the surveyor and assistants for the round trip, and also in view of the fact that prospectors as a class are poor men, would not this requirement be an effectual bar to all prospecting for mines in unexplored regions far distant from the confines of civilization?

8. Would you recommend vertical boundary lines in locating any class or condition of mineral deposits? If so, state the nature of such ore bodies and the nature of the formation in which they exist, whether primary or secondary.

9. Is any change in the mining law as it now stands, needed or required at this time, and would not the proposed change now sought to be made, work disaster and consequent ruin to the mining industries of the Pacific coast?

In response to the above, Mr. Skidmore sends us the following:

EDITORS PRESS:—I shall endeavor to reply briefly and concisely to your questions respecting the effect of the new mining bill now under consideration before a Congressional committee, and shall take up the questions in the sequence in which they are framed by you.

1. The depth at which ore bodies would pass outside of the 300 feet vertical line would depend on the dip of the ledge from a horizontal plane. In Amador county on the mother lode, where quartz mining has been continuously prosecuted for more than 20 years, with expensive plants, the depth attained would vary from 1,000 to 2,000 feet on the dip or incline of the ledge. By reference to statistical tables, I find that the dip of the mother lode in this county varies from 55° to 70°. Under such conditions the ledge would pass outside of the vertical lines at a depth of from 600 to 800 feet, while if we should refer to similar statistics of the leading mines of Nevada county we should find the average dip to approximate 50°. The depth attained in the leading producing mines varies from 800 to 1,600 feet, and in many of the most valuable properties in California the ledge would have passed without the exterior vertical lines at a depth of about 500 feet. It is the custom of miners to locate their ground so that the surface area shall correspond in width on either side of the supposed lode line, in order to protect themselves from the contingency of a change of dip below the surface plane, and to provide ample room for the plant, the wood pile and the ore and waste dumps, water ditches, etc. Nine claims out of ten located under the present United States mineral law cover 300 feet on each side of the lode, and in the event of the passage of the contemplated bill, mine owners under the new system would have to cease operations at some depth varying from 400 to 800 feet from the surface, or acquire by purchase all parallel locations on their front. Under these conditions, none of the leading producing quartz mines west of the Sierra Nevada would now be in operation.

2. Under the operation of the proposed law the mine owner, or company, would not be justified in erecting hoisting and pumping works and mill machinery, unless he possessed or controlled by location or purchase at least three parallel claims each of 600 feet in width by 1,500 in length. If we assume that his lode location carried 300 feet on each side of his cropping, he would require at least two more locations on his front or hanging wall side (1,200 + 300 feet = 1,500 feet) before he would be justified in the erection of pumping and hoisting machinery with capacity to explore his vein to a depth of 2,000 feet. The actual cost of such a plant, for mines in continuous operation, is frequently over $100,000, exclusive of cost of mill.

3. In many instances the depths at which the ledge would pass outside the 300 feet vertical boundary line would not be sufficient to predicate an opinion upon the value of the mine; and in a majority of cases the character and value of the ground could only be determined at this point of exploration, which is usually 100 feet below water level. The famous Eureka, Idaho and Empire ledges of Grass Valley, Nevada county, are examples in point, as also the Keystone, of Amador county; per contra, the Soulsby mine, of Tuolumne county, would not be affected, as it stands nearly perpendicular; but this is the exception.

4. No mining expert could indorse nor would any prudent business man invest in any quartz mine on the western slope of the Sierra Nevadas, if located under the proposed law, unless a frontage ground of at least 1,500 feet was secured in addition to the original location. It must be borne in mind that our profitable gold-bearing quartz ledges are of low grade—say from $10 to $20 per ton—and this grade is not sufficient inducement whereon to erect new plants and sink indefinitely through the country rock to intersect your neighbor's ledge. Such locations could only be held for purposes of extortion.

5. In the California quartz system the average depth at which the ledge, in its dip, would pass outside of the vertical line, under the 300-foot system, would be below the water level, and as a general rule the water line marks a change in the character of the ores.

6. The provision to allow one year for the discovery of ore would be detrimental to the interests of the locator and of the neighboring vein owner. It would permit valuable ground to be "tied up" in the interest of those who wished to extort and blackmail from the first locator, especially in new districts; and could be productive of no good to the capitalist, since the risk would be out of all proportion to the cost. But even if meritorious, one year's exploration would rarely be sufficient to uncover the supposed continuation on the line of dip, and the expense of sinking would be much greater through the country rock than that of the original locator, who followed his vein. Necessarily, such work would be useless, for either the mine owner must sell his plant, when he had reached his limit, or must purchase the undeveloped ground on his front, but the subsequent "locator" could prevent him from

prosecuting his mining work 300 or 400 feet below the soil.

7. The fourth provision of the proposed law would entail great and unnecessary expense upon the prospector. The fees of a U. S. Deputy Mineral Surveyor are usually $25 per day for field work (and expenses), or $10 per day for office work. The Deputy Mineral Surveyor usually has his residence either at the leading mining town of the district, or at the county seat, often from fifty to one hundred miles from the site of the prospector's discovery. The expense of a survey provided for by this act would vary from one hundred to two hundred and fifty dollars. The present act requires that the limits of the location shall be designated by metes and bounds and monuments. This should suffice as ample notice until such time as a U. S. patent is necessary, when the services of the Deputy Mineral Surveyor are called into requisition. As a matter of fact, nine out of ten locations are abandoned within the season located, and no necessity for survey exists until U. S. patents are applied for.

8. I can conceive of a condition of things wherein locations by vertical lines would be advantageous, but we have no instance of this character on this side of the Rocky mountains. The cavernous chambers of the Eureka Con. and Richmond have been judicially determined to be fissure veins, but it is probable that "bed-like deposits" of carbonate ores exist near Leadvilla, and elsewhere in Colorado, which would not be disastrously affected by the system of locations provided for in the new bill. Such deposits usually occur in the secondary formation.

9. No material change is needed in the mining laws of the United States. The theory that a vein or lode may be indefinitely explored on the line of the dip is coeval with the pursuit of mining, and under this theory all our rights of property have vested. Such an innovation as is now proposed would not only be detrimental, but fatal to the development of the mining interest of the Pacific coast.

Yours truly, W. A. SKIDMORE.

Jones' Self-Regulating Steam Trap.

In all places where steam is used, it is very desirable to catch and return the condensed steam where it can again be utilized, and the best water to put into the boiler is that which has been condensed from steam. It is in the most favorable condition for revaporizing. Where the pumps are at a distance from the boilers, there is always a liability of flooding them with water, and the steam is there less effective because of its lack of dryness. The Jones' Trap, manufactured by W. T. Garratt & Co., overcomes all such difficulties, and allows the condensed water to escape, while the steam cannot by any possibility blow out. These traps are used at the Mint, San Francisco, State University, State Capitol buildings, Mills Seminary and the California sugar refinery.

The pipe by which the steam enters is screwed in at *H*, the outlet pipe is at *G*, for steam connection, to be used only where steam is to be carried further on; the waste or outlet pipe for condensed water to pass out is at the end which is most convenient. If the steam is not to go beyond the trap, at *G*, it is plugged up. It is a steam drum as well as a trap. Dry steam can always be had; it is a valuable machine for steam engines to take the water out of the pipe before passing into the cylinder, or for taking it out of exhaust pipe after passing the engine, where the steam is wanted for heating, as it takes no power from the engine to force condensed water through the pipes. The condensed water passes through the pipes at *H* into conduct or strainer, which catches all refuse and thence into the basin in which is the float ball *A*. When the water in the trap reaches the hollow rod, *D*, it raises the float, which lifts the stem, *C*, from its seat, allowing the water to pass out. The hollow rod, *D*, opens at one end into the float, and at the other through the side into the open air; by this simple plan overcoming the objection to hollow balls, any leakage or sweating in them being evaporated into steam, and passing out, always keeping the float dry and the water at a uniform hight in the trap. It requires no attention, as it regulates itself by the flow of the water into it, and the steam cannot blow out to waste. The force of the steam makes no difference, if it is 5 lbs. or 100 lbs., it is all the same.

STATE DOCUMENTS.—We have received the following pamphlets, containing the reports of the departments or officers to which they refer, for the years 1878-79: "Transactions of the State Agricultural Society;" Report of Board of Commissioners of Sacramento Drainage District; Report of State Harbor Commissioners; Biennial Report of Secretary of State; Report of State Normal School Trustees; Report of Directors of Deaf, Dumb and Blind Asylum; Biennial Report of State Board of Equalization; Report of Fish Commissioners; Report of State Board of Examiners; Report of State Board of Health; Report of California State Prison Commission; Report of Insurance Commissioner; Report of Directors of Insane Asylum; Report of State Superintendent of Public Instruction; Report of Attorney-General; Report of Adjutant-General; Report of State Controller; Report of Commissioner of Transportation.

Legislative Matters.

Young has offered a substitute to the Sweetland substitute drainage bill. The general features of the original are preserved, except that all that part relating to district bonds was stricken out and provision made for a district tax of one-twentieth of one per cent., and an annual State tax of one-twentieth of one per cent., and a tax of one-third of one per cent. on each miners' inch of water used in the hydraulic mines. Provision was made for assessing lands benefited by the work proposed. In other respects the bill was the same as the original Crown-Parks bill.

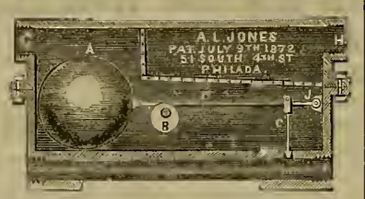
When the substitute had been read, on motion of Tyler it was ordered printed and sent to its place on the second reading file.

Pending discussion on other unimportant amendments, Sweetland introduced a resolution asking that several members, among them being one-half of the San Francisco delegation, be permitted to go to Marysville and look at the debris around there. Burns amended to have the whole Assembly take a trip to Marysville. Much confusion ensued, members asking for information and protesting against the resolution. On motion of Anthony, it was finally laid on the table.

Fraser has presented three petitions in favor of paying J. W. Marshall, discoverer of gold, $50 per month, as proposed in a bill before the House.

It is becoming questionable whether there can be any legislation on the debris question during the present session, notwithstanding its importance. There have been four bills in the Assembly on the subject. The first, that by Brown of Yuba, of which complaint was made that it was drawn too much in the mining interests, and too great powers were conferred. The second, by Carr of Yuba, drafted, as claimed by the miners, in the interest solely of the agriculturists. Then the bill filed by Chamberlain of Placer, providing for a State appropriation of $600,000 for the erection of dams in the canyons in the mountains to corral the debris. Fourth, a bill by Brooke of Butte, appropriating $30,000 for further investigation by the State Engineers' department. The Chamberlain bill has been killed. The Carr bill has been once defeated. The Brown bill has been so amended that it is claimed that it will not amount to anything. The Brooke hill is the *dernier resort*, if nothing better can be done.

Stroog efforts are making to effect a compromise upon the debris issue. Young submitted a substitute to raise funds by taxes in three districts, the first by a district tax one-twentieth of one per cent. Second, one-twentieth of one per cent. tax over the whole, and one-third of a cent tax on each miners' water running twenty-four hours. The amount which will be raised by this tax has been variously estimated from $400,000 to $600,000. It will be noticed that this substitute meets the objections which have been raised by the agricultural interests against the issue of bonds. Some of the farmers of Yuba are already objecting to the district tax, contending that they really have no more interest in the matter than the remainder of the State.



Jones' Steam Trap.

The following bill amending section 382 of the Code of Civil Procedure was introduced in the Senate by Davis of Yuba, to remedy the difficulty which arose in the recent debris suit. Of the parties to the action, those who are united in interest must be joined as plaintiffs or defendants, but if the consent of any one who should have been joined as plaintiff cannot be obtained, he may be made a defendant, the reason thereof being stated in the complaint; and when the question is one of a common or general interest of many persons, or where the parties are numerous, and it is impracticable to bring them all before the Court, one or more may sue or defend for the benefit of all. In actions to abate a nuisance or for an injunction to prevent the commission or continuance of acts creating a nuisance, all persons contributing to the creation or continuance of the nuisance complained of may be joined as defendants.

NEW MEXICO'S copper interests must in time become of even greater importance to the country than those of Lake Superior, for even now the Clifton district mines, near and extending over the Arizona line, pay $60 per ton for charcoal and $70 per ton for ox team transportation to the end of the track, and compete with the Lake Superior districts in the great markets of the East.

THE order to increase the police force of San Francisco was passed Monday night by the Board of Supervisors over the Mayor's veto.

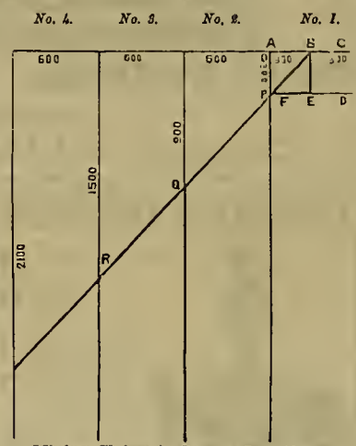
Congress and the Mining Laws.

The proposed legislation by Congress, with relation to the mining interests, is looked upon unfavorably by all the mining men with whom we have conversed on the subject. We are in receipt of a great number of letters from miners in different sections, asking us to oppose the changes and giving their opinions on the subject. Their views all agree with those expressed in an article in our last issue, and in these letters published in other columns of this number of the PRESS. The changes are universally condemned by the working miners, the prospectors and all those who expect to make a living out of mines by hard work.

We give on another page the full text of the proposed law, and also the views of a gentleman thoroughly conversant with the mining interests of this coast. We notice that on Wednesday, Representative Page made an argument before the House Mining Committee in opposition to any change in the present law authorizing ledge locations, so far as California is concerned. Berry has also, we understand, spoken against the changes.

The truth of the matter is, that if some of these propositions are adopted, poor men might as well give up trying to prospect for or locate mines. Not one of 20 new claims ever amounts to anything. The miners always call them "prospects" or "claims," not mines. They don't become mines until developed to produce ore regularly.

The provision requiring a man to have his claim surveyed within three months of date of location, coupled with that allowing a year to discover mineral, may do well enough for men of means, but not for the ordinary prospector. You cannot once in a hundred times prove the value of a claim in three months. Suppose a prospector, hard up as usual, starts in on a likely place and works a month or two; at the end of the time his "grub stake" is nearly



Mining Claims in Square Locations.

gone, but he perseveres in hopes of finding a "mine." Just then, however, he finds his three months nearly up, and must spend from $100 to $500 to bring a surveyor to the ground. He must, therefore, drop work and leave. Anybody with any money, having a year in which to find mineral, would pay for the surveyor, if he knew a claim near by was developing a good property, and he could sink down and take the ledge outside of their lines.

With reference to the square location, we append one of the many letters we have received on the subject, which will give a good idea of the injurious features of the proposed changes:

EDITORS PRESS:—If I am right in my interpretation of the proposed amendments, given in your last issue, there will be little prospecting and less mining done on this coast, should it become law.

The dimensions of a claim are fixed (as at present), 1,500 feet along the lode and 600 feet wide. Now, suppose a lode to pitch at an angle of 45°, and the croppings run along the center of the 600 feet lengthways of the 1,500, and a shaft is sunk on the croppings 300 feet from one of the side boundaries of the claim; the locator not being quite sure how his lode was going to dip, would, in all probability so locate his claim that the croppings would be in the center of the 600 feet, and sink on them. Suppose he does: At 300 feet depth he would be out of his ground, because the dip of the lode would carry him beyond the vertical of his side line, as shown in the accompanying diagram.

Thus, let *A*, *B*, *C*, *D*, *E*, *F*, represent a cross section of location No. 1, along its width to the depth of 300 feet; *B*, the line of the center of the lode; *B F*, the dip of the lode (say 45°); *B*, the point from which a shaft is to be sunk.

No sooner does the miner get down as far as *F* (300 feet), either by a vertical shaft, *B E*, or an incline on the lode, *B F*, with a crosscut, *E F*, and perhaps finds pay near *F*, none before possibly, then, being beyond the vertical line of his surface location at *A*, he is prevented from following the lode he has discovered by an anomalous piece of ill-advised legislation.

Meantime another has taken up the adjoining parallel claim, No. 2, sinks 300 feet from *O* to *P*, and reaps the benefit of No. 1's labor.

But he can only get down 900 feet when he is shut off by his end lines, at *Q*, having had only 600 feet on lode.

No. 3 sinks 900 feet in country rock, gets the lode at that point, and is shut off by his end lines at *R*, 1,500 feet deep, having only 600 feet of lode.

This system would involve a great many needless shafts to get down to the lode in unproductive ground, each one getting deeper as it gets farther away from No. 1, whereas by the law as it at present stands, one shaft would work the whole, because the owner of No. 1 is allowed to follow his lode on its dip *usque ad infinitum*. It would not mend matters much were it allowed by this proposed amendment of the law, to take the 1,500 feet across in place of lengthways of the lode. No. 3, for instance, being already down 900 feet would work his lode to the 1,500 at *R;* but to get to that depth, No. 4, would have to commence on top and sink another shaft 1,500 feet deep to get as low as No. 3.

Yours truly, LEWIS CHALMERS.

The Vulture Mine.

This well-known mine is located 15 miles from Wickenburg, in Arizona. It was discovered in 1862, and came into the possession of the Central Arizona mining company, of New York, about seven months ago. The property is three and a half days distant from San Francisco by railway and stage, of which latter method of conveyance there is a daily line each way. The telegraph is 15 miles distant. The company was incorporated in New York, with a capital of $10,000,000, and the stock is listed there.

The reputation of the mine has long been favorably established. From the date of its discovery until it passed into the hands of its present owners, the records of its operations show that 200,000 tons of ore were extracted, and the yield of bullion therefrom amounted to about $3,000,000. The present company intend to fully equip and develop the mine and to improve the entire property. For this purpose they will, if necessary, expend $200,000, or more. Water being scarce, their first movement has been to procure a sufficient supply, not only for milling purposes but also to supply the town which is expected to grow up on the town site included in the property. To accomplish this they have purchased 15 miles of pipe of sufficient capacity to deliver 18,000 gallons per hour. The ground has been surveyed, and the pipe will be laid as soon as it reaches the mine.

The present mill capacity being only sufficient to crush 50 tons per day, a new mill has been purchased with the capacity of reducing 240 tons every 24 hours. When fully completed it will not be surpassed by any mill in the Territory. The rock is readily crushed, and it is calculated that each stamp will pulverize three tons per day. The mill will run 80 stamps. There is sufficient fuel to last from 15 to 20 years. The mill machinery is being made in this city by the Golden Gate and Miners' Iron Works, and the mining outfit by the Risdon Iron Works.

The surrounding country is rolling, with a general slope toward the Gila river. The vein walls are mica slate. There is no water of any account to contend with in the mine thus far. The length of the lode is 2,000 feet. It has been explored over that extent to a depth of 600 feet, showing a body of ore estimated at 600,000 tons, which can be taken out without the necessity of deeper work. This estimate, as to quantity, will be considered moderate when the size of the lode is taken into account. The vein is 60 feet wide; it dips at an angle of 37 degrees. The ore is expected to pay for working from wall to wall. Selected ore will yield from $50 to $60 per ton in gold. The average through the whole vein is from $7 to $30. The lode carries free gold, and consequently it is an easy ore to work. Some of the threads or narrow seams in the vein are very rich.

Two double compartment shafts are being sunk, and will be carried down to the 600 level. Hoisting works will be used at both of them. The ground in the mine stands well, and so far, has required no timbering; it is firm and tenacious. There have been several chambers opened in the hulk of the vein upon rich bodies of ore; some of them are from 150 to 200 feet in length and from 20 to 30 feet high; and they stand well without having been timbered.

The Southern Pacific railroad now runs within 45 miles of the mine.

ANOTHER "PROCESS."—The telegraph informs us that Colonel A. C. Tichenor, inventor of "the electric process" of reducing gold and silver ores, which will revolutionize old methods, has passed through Omaha on his way to this city. It tells us, moreover, that "he has already realized over $200,000 from his invention, which has not been hardly introduced to the mining public." This revolutionizing of old processes, which has been going on for some twenty years or so, is like the revolutions in Mexico—no results. There have been several dozen electric processes tried in this State so far, none of them successfully. What the new one is, we do not know, but are somewhat curious to learn.

Something New in Sewage Disposal.

One of the most pressing of problems in great cities nowadays is how to get rid of their vast accumulations of sewage. Discharging it into rivers and harbors is only to exchange one kind of nuisance for another of rapidly increasing sort. To carry it hy any system of pipes or sewers far enough away to obviate this difficulty is a task of enormous labor and expense. Even in the case of seaports it is often an immense undertaking to throw it into the sea at a point where the tides will disperse it instead of bringing it back, like the proverbial home-returning curses. The city of Boston is now entering upon an expenditure of several millions of dollars for this purpose, and it is still a mooted question whether the system will he perfectly successful.

A new plan is about to be tried in England, which may prove, at least in some cases, both effectual and economical. For several years certain parties there have advocated the use of specially adapted vessels for depositing the sewage and refuse of large towns in deep sea-water, and it is believed the municipal authorities of Liverpool will possess the first of a fleet of vessels that will materially assist in the disposal of sewage. At present the refuse of Liverpool is removed from the city in carts, but hy the use of steamers specially designed for the purpose a considerahle amount of money will be saved. The new vessel resemhles externally an ordinary steamer. The hull and the deck are huilt of iron, hut in the construction of the hopper cavities steel is used. The vessel has heen designed to carry a dead weight of 350 tons, and her speed will he nine knots an hour. Instead of one large hold, she has ten compartments or cavities, and these are perpendicular in shape, so as to admit of the contents falling readily into the water. Along the center of the line of cavities is a set of gearing hy which the doors at the hottom are opened and shut, and by means of strong iron rods the doors are kept open until all the refuse has been emptied, while hy reversing the action of the gearing the compartments are closed again. The arrangements seem well calculated to attain the ohject in view, and the experiment will be watched with interest hy the municipal authorities of other large cities.

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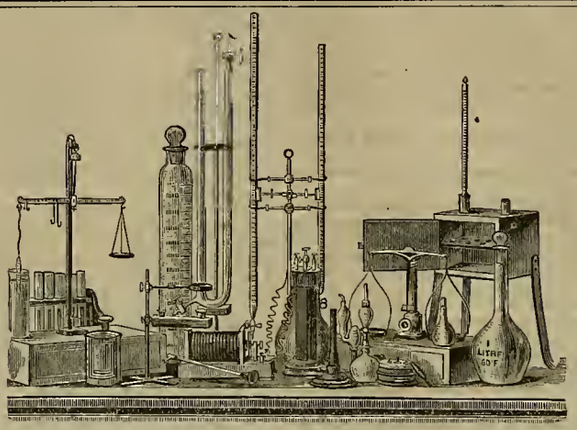

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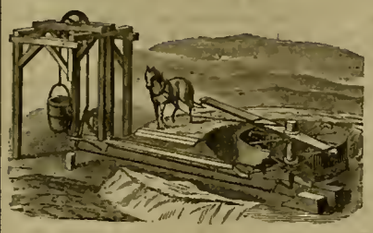

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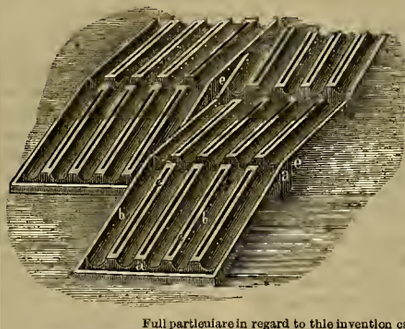

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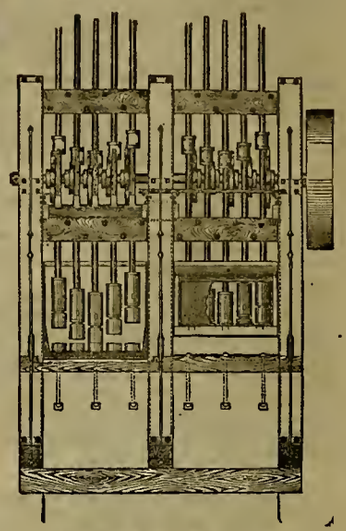

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We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,550.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

MOREY & SPERRY,

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Important to Mine Owners and Cities.

— THE —
Dodge Rock Breaker
CHALLENGES THE WORLD

To produce as good a machine. Sold at one-half the price of others, and guaranteed not to break.
Rock Breaker and Cornish Rolls Combined.
Rock Breaker and Pulverizer combined in one machine for pulverizing very fine.
Furnaces for chloridizing and desulphurizing ores.
Concentrating Jigs and Slime Machines for concentrating

Gold, Silver, Lead and Copper Ores.

Amalgamators, and plans for working ores by the various processes. Address

M. B. DODGE,
Care of Prescott, Scott & Co., San Francisco.

James H. Crossman, H. F. Baker, C. E., Mining Engineer.

CROSSMAN & BAKER,
MINE BROKERS,

No. 324 Pine St., room 7,

SAN FRANCISCO, CALIFORNIA.

Mining properties examined, surveyed and reported on; Ores and Minerals Assayed or Analyzed; Sales Negotiated or Capital procured for development.
Connections in London, Paris, Berlin, Vienna, New York, Boston, Philadelphia, Baltimore, St. Louis and Chicago.

A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Hueme, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

How to Stop this Paper.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter.*

CONTINUED FROM PAGE 197.

claims have been discovered in the Sierritas. The rock assays from 15% to 40% of copper and $30 per ton in silver. Large quantities of virgin copper may be seen in the ledge.

COLORADO.

TOPEKA.—*Register-Call*, Mar. 5: The mill ore crushed gave a yield of over eight ounces gold per cord.

JENNIE BLANCHE.—This mine has been developed by a line of shafts its entire length, which vary in depth from 20 to 110 ft. Present exploitations are made through shaft No. 1, down 110 ft. Two men in sinking the last 25 ft have taken out 12 tons of smelting material, besides quite an amount of mill dirt. The ore assays from $60 to $240 per ton. The crevice pitches to the north at an angle of 35°, the principal part of the pay matter being found on the hanging wall.

CALIFORNIA.—The daily output of ore is fully 50 tons. This production of the mine could very easily be doubled should the management desire it. Forty-five stamps find constant employment on the ore now being raised, to say nothing of the smelting ore being assorted.

TRIO.—Gold retorts amounted to 46 ounces. The average of the mill ore treated was a trifle over four and a half ounces gold per cord.

HAZELTINE.—The Hazeltine mining company has uncovered a large body of pay in both the east and the west 100 levels. The latter level has a large amount in the back of the level, the first quality of which brings over $700 per ton.

ANGLO-CELT.—In this mine they have struck gray copper in the bottom of the shaft which is being sunk upon the vein. Ore assaying as high as 2,200 ounces of silver per ton has been found.

MONARCH.—Silver Cliff *Prospector*, Mar. 7: This mine has a vein between three and four ft wide, composed of carbonates with some galena, assays from which run from 100 to 2,000 ounces silver. One hundred tons of this ore averaged over 100 ounces silver per ton.

MOUNTAIN CHIEF.—The shaft in this mine is 150 ft in depth, two levels running north on the vein, respectively 50 and 35 ft in length. The vein matter is composed of carbonates and galena enriched with chloride and sulphurets. The pay streak is from one to three ft in thickness and assays from 100 to 3,950 ounces silver. They shipped 15 tons of ore, the lowest mill run from which was 67, and the highest 575 ounces silver and 50% lead.

HUNKIDORI.—This claim has, by way of development, an adit 20 ft long at the end of which is a shaft 20 ft in depth, containing a vein six ft in width, with a streak of galena and carbonates three ft in width, running from 30 to 105 ounces silver.

IDAHO.

RAMSHORN.—*Enterprise*, Mar. 18: This was the first mine discovered in the vicinity of Challis; it was struck in 1877. In 1878 there were shipped 30 tons to Salt Lake, which averaged $800 per ton. In 1879 75 tons of ore were shipped, averaging $900 per ton. The vein is six ft wide. The ore shipped last season brought $32,000, running from 450 ounces silver and 55% lead to 1,105 ounces of silver. There are 500 tons on the dump of high-grade ore.

UTAH BOY.—Is a chloride ore, and assays from 450 to 1,000 ounces of silver, and is an extension of the Ramshorn. It has a shaft 40 ft and a tunnel on the vein 75 ft, and a vein of 7 ft of ore.

BEARDSLEY AND HOOD.—The ore is a carbonate-galena, and averages 100 ounces of silver to the ton. The Beardsley has a three-ft vein and an incline 70 ft; has ore on the dump and is improving as the incline advances. The Hood is in chimneys from 2 to 20 ft in thickness. These two mines shipped to Salt Lake last season 44,000 pounds of good ore. The Hood has a tunnel run on the vein 140 ft, and a large amount of ore on the dump ready for smelting.

EXCELSIOR.—It is a carbonate-galena ore. The vein is 18 inches wide. There are 100 tons of ore on the dump, which assays from 50 to 200 ounces of silver.

POVERTY FLAT.—They have a vein of three ft of chloride ore. Have run an incline upon the vein 50 ft, and have dumped a large quantity of ore.

VERMONT.—Is a chloride vein assaying $900 to the ton, the vein matter averaging 10 ft in width. Has shipped over 10,000 pounds the past season. They have run one incline 90 ft, and have good rich ore along the vein 500 ft.

BROADWAY.—Are sinking a shaft, and are down 60 ft on an average four-ft ledge of chloride ore, assaying from 700 to 1,000 ounces of silver across the vein, and a galena vein adjoining, assaying from 200 to 300 ounces of silver, while alongside they have a vein of copper glance, which they are shipping to Salt Lake.

IXO AND UNO.—Have veins averaging four ft at a depth of 50 ft.

EMMA.—It shows, at the bottom of an incline of 50 ft, a vein of chloride ore, which assays from 150 to 900 ounces of silver.

BUFFALO & ATLANTA.—*Statesman*, Mar. 11: The tunnel will cut the vein at a depth of 900 ft and extended to the eastern boundary, where it will be 1,800 ft below the surface. It has a double track high enough to work horses or mules in hauling the cars out to the dump and return. It is in 1,400 ft. The south wall of the lode has been cut and the tunnel run diagonally across the vein for 100 ft. The north wall has not been reached. The ledge where the tunnel has cut into it assays from $25 to $300 per ton in gold and silver.

MONARCH.—Has been worked for 10 years and produced in gold and silver over $600,000. It consists of 1,600 ft on the vein, and has been opened to the depth of 300 ft. Drifts and crosscuts run for almost the entire distance of the claim. The ore from which the above money was taken was of high grade, giving by fire assay from $500 to $6 000 per ton, and there is in the mine in sight over 25,000 tons of ore, which will assay from $50 to $100 per ton in gold and silver.

OLD CHUNK.—There are three tunnels, one near the surface 400 ft long, in which was found rock, mostly gold bearing, worth $20 per ton. The second tunnel was run 40 ft below the first for 175 ft, and the same character of ore met with. There is an immense body of ore of this grade in sight. The third or lower tunnel is run 500 ft. At 400 ft from the entrance the ledge was found to be 25 ft wide. An average of the whole ledge shows, by fire assay, $55.55 per ton, 40% of which is gold and the balance silver.

MONTANA.

BELL.—Butte *Miner*, Mar. 9: The work of development is being mainly prosecuted through the middle one of the three shafts. A great deal of free ore has been taken out of the first level, which, at a depth of 40 ft from the surface, extends east 40 ft and west 100 ft, and operations are now chiefly conducted on the second level 70 ft below, which is being pushed both east and west. In the west level the ore body is five ft wide, and has been stoped out almost to the upper level. The ore now being mined is exceedingly rich in both silver and copper, carrying 80 ounces of the former and 35% of the latter. The ore vein along the entire length of this level, with the exception of a few ft, is strong, and has every indication of permanence. Is being close to the west line, downward development awaits the erection of pumping machinery. In the west or main shaft, which has attained a depth of 145 ft, a crosscut will be run to the vein, which carries a high percentage of copper, as well as assaying well in silver. Before the ledge pitched from the shaft, 30 tons of ore were extracted and sacked for shipment, which contained 47% copper and 40 ounces in silver, some of the second-class ore extracted carrying a little less. Operations on the Bell have always been profitable, 1,500 tons of ore having been taken out, the average value of which was not less than $00.

OREGON.

MINING ITEMS.—Jacksonville *Sentinel*, Mar. 17: Two Indians prospecting on Scott river found a nugget weighing four and one-half ounces. The Squaw Lake company has ample water, and is piping dirt through their flume very fast. Piping at McCall & Anderson's diggings, near the Eagle mills, is going on. These claims have always yielded handsomely. The Sterling company is working with a very light head of water, their ditch being only one-third full, owing to the exceedingly cold nights. Cleaning up has commenced at the Centennial, in the Willow Springs district, on account of the failure of water. Keaton, Klippel & Co., on Poorman's creek, are still working with a full head of water in good paying ground. They have already moved twice as much ground as was moved the whole of last season. At the Star Gulch mine a partial clean-up was made, amounting to 60 ounces of dust valued at $1,122. W. G. Kenny, just returned from Josephine county, tells us that the Messrs. Wimer have struck it rich in their hydraulic claim near Waldo. The claim is now well opened, and a stratum of gravel, several ft in thickness, that prospects a bit to the pan, or over $3 to the cubic yard, has been developed.

UTAH.

HIGHLAND CHIEF.—Salt Lake *Tribune*, Mar. 21: This mine is located in Little Cottonwood canyon, $00 ft from and above the Emma, in a northwestern direction. The discovery shaft is an incline of 250 ft, which is intersected by a tunnel 640 ft in length. An incline 350 ft in length extends below the tunnel level, cutting the vein the entire distance, which is from one to six ft in width. It has produced over 1,900 tons of ore, average value per ton 28% lead and 34 ounces silver, yielding about $65,000.

OREGON.—Is in the Big Cottonwood district; at a depth of 350 ft an ore body of fair grade has been found, which is supposed to be the main chimney of ore found at the west end of the shaft and dipping east. The first west winze is in fine ore with walls as smooth as a mirror. They are sinking the main shaft rapidly, and will soon have it 100 ft deeper.

YESORA.—Is in Tintic district, and has produced $35,000 worth of ore. The ore goes from $50 to $60 per ton, and carries gold, silver and copper.

INDIANA.—Is at Bingham. A tunnel has been run on the vein 145 ft, showing an average of four ft of free milling ore.

DIAL.—The tunnel is being driven on the vein, which shows at the face a fine body of carbonate ore of 35% lead and from 10 to 135 ounces silver and $5 gold. A shaft is down 160 ft. Forty ft from the bottom ore was struck carrying 140 ounces silver. The mine is situated opposite the Winnamuck and close to the Bingham Canyon railroad.

HAP HAZARD.—A tunnel of 80 ft has been run on the vein, showing an average of four ft of ore. The pay streak shows gold, silver and lead, and brings in the market $50 per ton. A new tunnel is being started to tap the ledge, which will cut it at about 220 ft deep.

THOR.—Is on the west side of South Fork, 3,000 ft south of Kesler's peak. The ore assays over 80 ounces silver and 40% lead.

News in Brief.

THE Chinese exodus to the East still continues.

THE negro laborers are on a strike in St. Charles parish, La.

THE distress in the famine districts of Ireland is deepening daily.

THE Assembly is still wrestling with the Parks Drainage bill.

A SHARP shock of earthquake occurred at Los Angeles March 21st.

THE President has nominated Bret Harte to be Consul at Glasgow.

ANOTHER plan is out for a ship railway across the Isthmus of Darien.

BREAKS in the levees between Memphis and Vicksburg are reported.

THE Legislature is still industriously at work on the McClure charter.

THE cigarmakers' strike at Cincinnati has ended, after lasting four weeks.

The Duchess of Marlborough says there is now no fear of famine in Ireland.

THE Rhode Island Democrats have nominated Horace M. Kimball for Governor.

THE Kamloops outlaws have been sentenced to death at New Westminster, B. C.

MISS LOU M. JAMES, aged 17 years, committed suicide at San Jose Saturday night.

THE workmen at the Mare Island Navy Yard will have to labor ten hours a day hereafter.

IN San Francisco half dollars are quoted at par; Mexican dollars, 91 buying, 91½ selling.

A RAILROAD is to be built from Bismarck, D. T., to the Black Hills, a distance of 250 miles.

THE Secretary of the Territory of Arizona has been arrested for violating the revenue law.

A NUMBER of the bondsmen of Shaher, Treasurer of San Francisco, have withdrawn from his bond.

Two grain-laden propellers have arrived at Toledo, O., the earliest grain arrivals known at that port.

SILVER in London March 22d, 52⅞d; consols, 97 15-16; 5% United States bonds, 105; 4s, 108½; 4½s, 110¼.

DANIEL CONWAY, of Erie, Pa., has become violently insane in attempting to solve the "fifteen puzzle."

IMMENSE numbers of guns have been made in England and shipped to China for use against the Russians.

THE United States Circuit Court at San Francisco has decided that the law prohibiting the employment of Chinese by corporations is unconstitutional.

Liverpool Metal Market.

We are indebted to James Lewis & Son's Monthly Report of March 1st for the following items :

Copper—The quotations were for bars, good ordinary brands, £70 10s to £71 per ton; best brands, £71 to £71 10s, and £71 10s to £72 for G. O. B.'s with forward delivery. Ore, 14s 9d to 15s; regulus, 15s to 15s 3d per unit. Sales, regulus, 613 tons at 15s; ore, 5,166 tons at 13s 0½d to 15s 3d; precipitate, 358 tons at 14s 7½d to 15s 3d, all per unit. Stock on hand equal to 29,953 tons fine against 30,506 tons on February 1st.

Lead has declined to £18 15s to £19 5s per ton for ordinary shipping brands, and £18 2s 6d to £18 7s 6d per ton for Spanish soft silver.

Antimony unchanged, £71 to £73 per ton for French Star regulus.

Tin has fallen £6 per ton to £92 10s to £93 for Straits and Australian, and £97 to £99 per ton for English.

Manufacture of Leather Belting.

Much of the belting that has heretofore been used on this coast has been brought here from the East. The greatest portion now used here is manufactured in this city. It possesses the great advantage over Eastern belting in being made of oak-tanned leather. The oak bark being so much more plentiful here, and consequently cheaper, the Eastern manufacturers cannot compete with our own for this class of leather. The most of the Eastern belting leather is tanned by chemical process, which, while it expedites the manipulation, has a tendency to detract from the tensile power. It occupies over three months to perfectly oak-tan belting leather. Sole leather is simply tanned. The work upon belt leather is more complete.

In all positions where the belting can be kept dry, leather belting will outlast any other kind. India rubber belting will not stretch as much as leather where it is brought in contact with water; but it wears out sooner than leather, even in those positions. When they begin to wear, it is very difficult to repair them; and there is no limit to their stretching, as there is in the case of leather.

The average strain which leather will bear is 3,200 lbs. per square inch of cross section. A very superior quality will sustain a greater strain. Belts should not be subjected to a strain of more than 1-11th of their tensile strength, or 290 lbs. to the square inch of cross section. The strain is in direct proportion to their thickness. The working adhesion is in proportion to the belt contact with surface of pulley. They should always be worked with the grain side to the pulley, and a much greater effect will be produced by having the pulley covered with leather.

The manufactory of L. P. Degen, at No. 10 Fremont street, in this city, uses over 500 sides of superior belting leather per month. He has it tanned under his supervision and directions expressly for his own use. His factory has been in operation four years, and his business is constantly increasing. He produces belts of all sizes, from the very narrowest to the widest. He can turn out belts 60 inches wide, although the widest in general use is 32 inches. He uses none but the oak-tanned leather, and the larger belts are always cut from the center of whole hides, as that portion of the leather is the firmest and most durable. Belts are made of double or single thickness. The double belts are firmly and compactly riveted. All the belts of his make pass under his personal inspection, and are soaped, scoured and stretched by the latest improved machinery. The belting is subjected to a stretching process which, while it does not deteriorate from its tensile power, prevents that tendency to stretching when in use that causes so much annoyance to those whose machinery it keeps in motion.

Those who wish to obtain as good an article of belting as can be found in San Francisco, would find it to their advantage to examine the belting which he manufactures and offers for sale.

Pacific Iron Works' Circular.

We have received this week the "Circular and Pattern List" of the Pacific Iron Works, of this city, a handsomely illustrated and printed pamphlet, of some 120 pages. The engravings represent the different forms of pumping and hoisting machinery, mills, furnaces, sugar machinery, etc., etc., of which the Works make a specialty. The circular also contains a good deal of material of value to mining men, such as water-tables, water required for pans, for settlers, stamps, boiler, dry and wet crushing mills, etc., etc.

The Pacific Iron Works have now been in successful operation for the past thirty years, and have been intimately connected with the mining developments and industrial progress of the States and Territories of the Pacific coast during that time. From a comparatively small beginning in 1850, its increasing patronage has continually demanded enlarged facilities, until the establishment will now compare favorably in all its appointments with any similar one in the country. The several departments are well equipped with the most efficient tools and appliances, enabling the Works to execute orders of any magnitude required, in a superior manner and in a short time.

The illustrations and descriptions contained in the circular give a fair idea of our progress in everything relating to mining machinery and the various mechanical interests of the coast. Carefully prepared plans and specifications relating to all branches of work are furnished, with estimate of cost when desired. The Works make a specialty of mining machinery of all kinds, and particularly mills and furnaces. The circular is tastily printed, and is worthy of preservation for reference for the information it contains.

A DISPATCH from Paris, under date of March 6, says: M Dauhourg, a French engineer, claims that he has devised means for transporting large vessels over isthmuses, however steep, and an experiment is shortly to be made at Argenteuil by lifting a ship of 2,000 tons from the River Seine and taking it on rails to another point on the river.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING MARCH 16, 1880.

235,518.—PRESERVING EGGS—A. Good, S. F.

225,608.—SIEVE PROTECTOR FOR THRESHING MACHINES—T. J. Hubbell, Pescadero, Cal.

225,653.—SAFE FOR PROVISIONS—D.N. Smith, San Bernardino, Cal.

225,671.—GEARING MECHANISM FOR STRAW CUTTERS—J. Weichhart, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention :

SIEVE PROTECTOR FOR THRESHING MACHINES. Thomas J. Hubbell, Pescadero, Cal. Patented March 16, 1880. No. 225,608. This invention relates to a novel attachment for threshing machines, which enables a greater increase in the capacity and efficiency of the cleaning sieves; and it consists in the employment of a peculiar guard or protector, which is suspended directly above the shoe, so as to receive the grain, chaff and what straw may fall from the carrying-belt, and which usually falls directly upon the sieves. In ordinary machines the greater bulk of the long straw is carried away over the tail of the machine by the straw-carrier; but the great majority of the chaff and some of the straw will pass down upon the sieves with the grain, and it falls in such a quantity that it is very difficult for the best cleaning shoes to properly dispose of the amount of grain which the machine is capable of threshing. This guard or protector is intended to receive the mass as it falls from the draper or carrying-belt and distribute it, cleaning away also the most of the straw and chaff by an independent shaking device, so that the sieves in the shoe can act much more perfectly.

New Railroad Developments.

The following correspondence of the S. F. *Bulletin*, from Centerville, Alameda county, Mar. 21st, contains information of general interest and importance:

In an interview with Thomas Carter, Superintendent of the South Pacific Coast railroad, he said that the trains would run through to Santa Cruz about the middle of next month, and on May 1st there will be a new time-table used and a formal opening of the road for business to Santa Cruz. The first through train on the new table leaves San Francisco at 6:30 A. M., and the last at 4:30 P. M.; returning trains leave Santa Cruz at 4:45 A. M.; the last at 2:50 P. M. There will be three through passenger trains and one freight each way, also hourly communication with Alameda, commencing at 6:30 A. M. and ending at 8:30 P. M. In going through the tunnel at Wright's on Saturday we found the timbers all up, and, as W. H. Martin (one of the contractors) said, practically finished, there remaining some sills to be changed where the ground has swollen and broken the old ones; and the removal of rock which has dropped from the cars in carrying the dirt out. The tunnel has an elevation of 10 feet in the center to allow a good drainage of the water which drips through in some parts. The locating of this tunnel was done about three years ago by E. H. Mix, Chief Engineer of the road, and came out exactly. There is a good circulation of air through it, and sometimes during the day there is breeze enough to blow out a candle. There is no more danger of explosions from gas. Mr. Martin said the people generally did not understand how the gas occurred that caused the explosions. It lay in seams, and when broken open would burst out suddenly, the heavy pressure behind forcing the tunnel full in a few moments. Until they found how it was, the engineers could not avert the explosions. Since then they have used the blower. To give his words: "We have struck a seam that if it was exploded would have blown up the whole mountain. The whole place for a mile or so smelt of gas for a week, but when mixed with the outside air it became too weak to ignite."

This road has just received two new freight engines from the Baldwin Locomotive Works. They are the largest on the road. No. 3, 9 and 10. They are being put together at the San Jose round-house. They will be completed by Wednesday, and are designed for the heavy work between San Jose and Santa Cruz.

Our Newspaper Binder.

We now offer our subscribers a durable and handy self-binder for this paper. It is made of stiff cloth sides with adjustable, elastic fastenings. It is simple and cheap. Price, $1. To our subscribers, 75 cents. Sent postpaid to any address in the United States. If not satisfactory on examination, return it and we will refund the cash.

REMOVAL.—We call attention to the removal of the Vulcan Powder Company's offices to 218 California street. See notice in another column.

A VETERAN PIONEER GONE.—Mr. John A. T. Overend, a well-known pressman and inventor of this city, died on Sunday last of paralysis. He has been a resident of California since 1850, and was at various times head pressman on the *Times*, *Transcript*, *Alta*, *Bulletin* and *Call*. For the past seven or eight years he has been proprietor of the steam power works on Commercial street, from which power was furnished to many offices in the vicinity. Mr. Overend was an ingenious inventor in his special line. He was the patentee of a device for cutting printers' leads, a type-casting and finishing machine, and a combined pump condenser and heater. Most of his inventions were successfully introduced. He was still perfecting other, and as he believed more important inventions. A man of quiet, industrious habits, he was almost universally respected by those who knew him.

THE Workingmen of this city have nominated J. Richard Freud as Senator in place of Desty, disqualified. He has been endorsed by the Democrats, and will vote for a Democrat for U. S. Senator. The Republicans have renominated J. M. Byrnes.

METALS.

[WHOLESALE.]
WEDNESDAY M., March 24, 1880.

IRON.—	
American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	— @35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 8½
Hurst Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 16
Plow Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	—@—
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	6 @— 6½
Bar	— @— 6½
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck, " "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.—	
10x14 I C Charcoal	— @10 50
10x14 I O Coke	10 00 @10 00
Banca Tin	—@25 00
Australian	— @20 00
I. C. Charcoal, Roofing 14x20	— @10 00
" " " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	10½@— 11
NAILS.—	
Assorted sizes	6 50@6 75

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]
SAN FRANCISCO, March 24, 3 P. M.

SILVER, ½ par.

GOLD BARS, 890@910. SILVER BARS, 10@18 ⅜ cent. discount.

EXCHANGE on New York, 25, on London bankers, 494@494. Commercial, 50; Paris, five francs ⅜ dollar; Mexican dollars, 90@92.

LONDON Consols, 97 13-16; Bonds (4%), 108½

QUICKSILVER in S F by the flask ⅜ lb. 42½@45c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending March 23, 1880.

HIGHEST AND LOWEST BAROMETER.

Mar. 17	Mar. 18	Mar. 19	Mar 20	Mar. 21	Mar. 22	Mar. 23
30.130	30.232	30.308	30.299	30.327	30.211	30 055
29.918	30.130	30.240	30.239	30.203	30.043	29.071

MAXIMUM AND MINIMUM THERMOMETER.

53	53	57	57	62	57	56
48	43	43	45	45	43	43

MEAN DAILY HUMIDITY.

82.7	76.7	81.7	84.7	78	84.3	76.3

PREVAILING WIND.

NW	W	W	W	W	W	SW

WIND—MILES TRAVELED.

183	217	205	216	217	108	241

STATE OF WEATHER.

Fair.	Clear.	Clear.	Clear.	Fair.	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

.38						

Total rain during the season, from July 1, 1879, 14.45 in.

Various Causes—

Advancing years, care, sickness, disappointment, and hereditary predisposition—all operate to turn the hair gray, and either of them inclines it to shed prematurely. AYER'S HAIR VIGOR will restore faded or gray, light or red hair to a rich brown or deep black, as may be desired. It softens and cleanses the scalp, giving it a healthy action. It removes and cures dandruff and humors. By its use falling hair is checked, and a new growth will be produced in all cases where the follicles are not destroyed or the glands decayed. Its effects are beautifully shown on brashy, weak, or sickly hair, on which a few applications will produce the gloss and freshness of youth. Harmless and sure in its operation, it is incomparable as a dressing, and is especially valued for the soft luster and richness of one it imparts. It contains neither oil nor dye, and will not soil or color white cambric; yet it lasts long on the hair, and keeps it fresh and vigorous.

FOR SALE BY ALL DEALERS.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

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Chew JACKSON'S BEST Sweet Navy Tobacco

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-seventh (27th) day of February, 1880, to pay the delinquent assessment together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, 420 Montgomery St., San Francisco, Cal.

Cataract and Wide West Gravel Mining

Company.—Location of principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment levied on the 2nd day of February, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. Shares.	Amt.
John H Floto	624	50	12 50
John H Carey	413	75	18 75
John H Carey	708	50	12 50
Thomas Bates	446	25	6 25
Thomas Bates	448	25	6 25
Thomas Bates	450	25	6 25
Thomas Bates	456	25	6 25
Thomas Bates	457	50	12 50
Thomas Bates	462	5	1 25
Thomas Bates	463	10	2 50
Thomas Bates	469	50	12 50
Thomas Bates	481	10	2 50
Thomas Bates	483	25	6 25
John D Barry, Trustee	577	1000	250 00
Virginia P Paul	636	10	2 50
Jno M Bowers	630	200	50 00
Thos F Baines	637	50	12 50
J E W Coleman	625	50	12 50
Robt Rostron	306	50	12 50
James White	419	20	5 00
James White	421	50	12 50
G Frederick	523	30000	7500 00
Theresa Bowers	551	100	25 00
Theresa Bowers	631	200	50 00
Theresa Bowers	632	50	12 50
Mary C Floto	547	400	100 00
Mary C Floto	548	100	25 00
Mary C Floto	601	500	125 00
Mary C Floto	623	450	112 50
Edwin McNevio	622	250	62 50
John Rostroo	600	100	25 00
Emma Floto	604	500	125 00
George Floto	620	25	6 25
Wilber Curtis	633	25	6 25
Wilber Curtis	634	25	6 25
Wilber Curtis	640	50	12 50
Wilber Curtis	642	50	12 50
Wilber Curtis	643	50	12 50
Wilber Curtis	644	50	12 50
Wilber Curtis	648	25	6 25
Anne Slibitz	683	50	12 50
Augustus Slibitz	634	50	12 50
J T Stono	006	150	87 50
D Campbell	698	25	6 25
J M Bryao	690	226	56 50
A J Dowling	701	50	12 50
F F DuRose	703	500	125 00
A G Lawrence	706	500	125 00
Henrietta Siebeck	716	50	12 50
Robt Reed	638	100	25 00
J C DeVoy, Trustee	331	1000	250 00
J C DeVoy, Trustee	332	1000	250 00
J C DeVoy, Trustee	333	1000	250 00
J C DeVoy, Trustee	334	1000	250 00
J C DeVoy, Trustee	335	1000	250 00
J C DeVoy, Trustee	337	250	62 50
J C DeVoy, Trustee	338	250	62 50
J C DeVoy, Trustee	330	250	62 50
J C DeVoy, Trustee	340	250	62 50
J C DeVoy, Trustee	341	250	62 50
J C DeVoy, Trustee	342	250	62 50
J C DeVoy, Trustee	343	250	62 50
J C DeVoy, Trustee	344	250	62 50
J C DeVoy, Trustee	345	250	62 50
J C DeVoy, Trustee	346	250	62 50
J C DeVoy, Trustee	347	500	125 00
J C DeVoy, Trustee	348	300	75 00
J C DeVoy, Trustee	340	500	125 00
J C DeVoy, Trustee	350	300	75 00
J C DeVoy, Trustee	351	500	125 00
J C DeVoy, Trustee	352	500	125 00
J C DeVoy, Trustee	353	500	125 00
J C DeVoy, Trustee	354	500	125 00
J C DeVoy, Trustee	355	500	125 00
J C DeVoy, Trustee	356	500	1 5 00
Elizabeth T DeVoy	357	300	75 00
J C DeVoy, Trustee	358	500	125 00
Elizabeth T DeVoy	350	300	75 00
J C DeVoy, Trustee	300	500	125 00
Elizabeth T DeVoy	361	300	75 00
Elizabeth T DeVoy	362	300	75 00
Elizabeth T DeVoy	363	300	75 00
Elizabeth T DeVoy	364	300	75 00
John C DeVoy, Trustee	365	300	75 00
John C DeVoy, Trustee	366	300	75 00
John C DeVoy, Trustee	368	50	12 50
John C DeVoy, Trustee	369	50	12 20
John C DeVoy, Trustee	370	50	12 50
John G DeVoy, Trustee	371	50	12 50
John C DeVoy, Trustee	372	50	12 50
John G DeVoy, Trustee	373	50	12 50
John C DeVoy, Trustee	375	50	12 50
John G DeVoy, Trustee	376	50	12 50
John C DeVoy, Trustee	377	50	12 50
John G DeVoy, Trustee	378	50	12 50
John C DeVoy, Trustee	380	50	12 50
John G DeVoy, Trustee	381	50	12 50
John O DeVoy, Trustee	382	50	12 50
Jobo O DeVoy, Trustee	383	50	12 50
John O DeVoy, Trustee	386	50	12 50
John C DeVoy, Trustee	387	50	12 50
John C DeVoy, Trustee	388	50	12 50
John C DeVoy, Trustee	389	50	12 50
John C DeVoy, Trustee	390	50	12 50
J C DeVoy	401	50	12 50
J C DeVoy	403	50	12 50
Elizabeth DeVoy	441	100	25 00
Elizabeth DuVoy	442	100	25 00
J C DeVoy, Trustee	443	100	25 00
J C DeVoy, Trustee	444	100	25 00
J C DeVoy, Trustee	482	100	25 00
J C DeVoy, Trustee	484	100	25 00
J C DeVoy, Trustee	486	100	25 00
J C DeVoy, Trustee	488	100	25 00
J C DeVoy, Trustee	490	1000	250 00
J C DeVoy, Trustee	495	50	12 50
J C DeVoy, Trustee	496	50	12 50
J C DeVoy, Trustee	497	50	12 50
J C DeVoy, Trustee	498	50	12 50
J C DeVoy, Trustee	499	50	12 50
J C DeVoy, Trustee	500	50	12 50
J C DeVoy, Trustee	501	100	25 00
J C DeVoy, Trustee	502	100	25 00
J C DeVoy, Trustee	503	100	25 00
J C DeVoy, Trustee	504	100	25 00
J C DeVoy, Trustee	505	100	25 00
J C DeVoy, Trustee	506	100	25 00
J C DeVoy, Trustee	507	100	25 00
J C DeVoy, Trustee	508	100	25 00
J C DeVoy, Trustee	509	100	25 00
J C DeVoy, Trustee	510	100	25 00
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J C DeVoy, Trustee	516	100	25 00
J C DeVoy, Trustee	517	100	25 00
J C DeVoy, Trustee	518	50	12 50
J C DeVoy, Trustee	519	100	25 00
J C DeVoy, Trustee	520	50	12 50
J C DeVoy, Trustee	521	50	12 50
J C DeVoy, Trustee	522	50	12 50
J C DeVoy, Trustee	523	50	12 50
J C DeVoy, Trustee	524	125	31 25
J C DeVoy, Trustee	527	125	31 25
J D Sarry	600	100	25 00
J H Carey	695	250	62 50
J H Carey	722	1850	462 50
J D Barry	723	3000	750 00
John Rostron	724	400	100 00
J H Floto	302	300	75 00
F F DuRose	628	150	37 50
Jno H Floto	302	300	75 00
Laura A Tallmadge	542	25	6 25
A Wm Meyers	715	300	75 00

And in accordance with law and an order of the Board of Directors made on the 2nd day of February, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, No. 20½ Kearny street, San Francisco, California, on Monday, the 20th day of March, 1880, at the hour of 10 o'clock A. M. of said day, together with costs of advertising and expenses of sale.

WM. B. LAKE, Secretary.

Office, 20½ Kearny street, San Francisco, California.

Consolidated Pacific Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Bodie Mining District, Bodie, Mono County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Thirteenth day of March, 1880, an assessment (No. 1), of One Dollar per share was levied upon the capital stock of the corporation, payable immediately in lawful money of the United States, to the Secretary, at the office of the Company, 330 Pine St., room 5, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Sixteenth day of April, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the Eighth day of May, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

F. E. LUTY, Secretary.

Office—No. 330 Pine street, room 5, San Francisco, Cal.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Eighth day of March, 1880, an assessment (No. 41) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twelfth day of April, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the Third day of May, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) levied on the 14th day of January, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
J R Robbins, Trustee	17	68	6 80
J R Robbins, Trustee	61	1000	100 00
A Hinds	57	1000	100 00
J K Cooper, Trustee	106	100	10 00
T L Bibbins, Trustee	00	100	10 00
T L Bibbins, Trustee	100	100	10 00
T L Bibbins, Trustee	103	50	5 00
T L Bibbins, Trustee	136	1000	100 00
T L Bibbins, Trustee	142	450	45 00
T L Bibbins, Trustee	148	50	5 00
T L Bibbins, Trustee	150	500	50 00
T L Bibbins, Trustee	157	100	10 00
T L Bibbins, Trustee	103	100	10 00
T L Sibbins, Trustee	176	50	5 00
T L Sibbins, Trustee	213	100	10 00
T L Bibbins, Trustee	220	100	10 00
T L Bibbins, Trustee	231	100	10 00
T L Bibbins, Trustee	254	20	2 00
T L Bibbins, Trustee	436	1000	100 00
M French, Trustee	346	1000	100 00
H R Taylor, Trustee	340	50	5 00
J Griswold, Trustee	441	6900	690 00
Unknown	251	65	6 50
Unknown	253	30	3 00
Unknown	250	42	4 20
W Townsend, Trustee	410	1000	100 00
W Townsend, Trustee	411	500	50 00
W Townsend, Trustee	412	500	50 00
T A Wright, Trustee	300	1000	100 00
J R Robbins	257	20	2 00
G L Waters, Trustee	419	200	20 00
W J Gwynn	102	1000	100 00
M K Lauden, Trustee	300	1000	100 00
M K Lauden, Trustee	301	1000	100 00
M K Lauden, Trustee	302	1000	100 00
M K Lauden, Trustee	303	1000	100 00
M K Lauden, Trustee	394	1000	100 00
E A Richardson, Trustee	315	500	50 00
E A Richardson, Trustee	316	500	50 00
E A Richardson, Trustee	317	500	50 00
E A Richardson, Trustee	318	500	50 00
E A Richardson, Trustee	319	500	50 00
E A Richardson, Trustee	320	500	50 00
E A Richardson, Trustee	321	500	50 00
E A Richardson, Trustee	322	500	50 00
E A Richardson, Trustee	323	500	50 00
E A Richardson, Trustee	324	500	50 00
E A Richardson, Trustee	325	500	50 00
E A Richardson, Trustee	326	500	50 00
E A Richardson, Trustee	327	500	50 00
E A Richardson, Trustee	328	500	50 00
E A Richardson, Trustee	329	500	50 00
E A Richardson, Trustee	330	500	50 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 314 Bush street, San Francisco, on Thursday, the 11th day of March, 1880, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

T. L. BIBBINS, Secretary.

Office—314 Bush street, San Francisco, California.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Thursday, the 25th day of March, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Tuesday, the 20th day of April, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, room 37, San Francisco,

March 15th, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 53) of Thirty Cents per share was declared, payable on Saturday, March 20th, 1880. Transfer books closed until the 22d inst.

P. JACOBUS, Ass't Secretary.

EVERY FOOT WARRANTED.

BELTING AND PACKING.

EXTRA QUALITY ENOLESS BELTS.
STEAM AND SUCTION HOSE,
AIR, OIL AND BREWERS' HOSE,
CAR SPRINGS, VALVES, GASKETS, Etc.

All Kinds of Rubber Goods Made to Order at a Few Hours' Notice.

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ON THE PREMISES.

Goodyear Rubber Co.,

R. H. PEASE, Jr.,
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MONEY TO LOAN!

$500,000

To loan, in one sum or in amounts to suit on Wheat Lands, Wheat in Warehouses, and other good collaterals at current rates of interest.

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The highest price paid for balances in The Savings and Loan (Clay St.,) Odd Fellows', Masonic, Fresno, Farmers' and Mechanics', by

JOHN T. LITTLE,
302 Montgomery St., rooms 1 and 2, San Francisco.

SOUTH PACIFIC COAST R. R.

(NARROW GAUGE)

COMMENCING MONDAY, DECEMBER 1st, 1879. Boats and Trains will leave San Francisco daily, from Ferry Landing, foot of Market street, at 5:30 A. M., 9:00 A. M and 4:00 P. M., for ALAMEDA, SAN JOSE, LOS GATOS, WRIGHT'S, and all way stations.

Stages connect with 9:00 A. M. train at Wright's for Hotel de Redwoods, Soquel and Santa Cruz.

Ferries and Local Trains Daily.

FROM SAN FRANCISCO—5:30, †6:40, †7:45, 9:00, 10:30 A. M 12:00 M., 1:30, 4:00, 5:15, 6:30, 8:30 P. M.

FROM HIGH STREET, ALAMEDA—†6:40, †6:45, 7:50, 9:07, 10:35 A. M., 12:05, 2:40, 4:05, 5:23, 6:35, 9:35 P. M.

†Daily. Sundays excepted.

☞ SECOND-CLASS FARE TO SAN JOSE, $1, on train leaving San Francisco at 5:30 A. M. daily (except Sundays.)

A TRAIN will leave San Francisco on Sundays at 5:30 A. M; the 7:45 Sunday train having been discontinued.

THOS. CARTER, Superintendent. G. H. WAGGONER, Gen'l Pass'r Ag't.

NOTICE OF REMOVAL.

THE OFFICE OF THE

Vulcan Powder Company

HAS BEEN REMOVED TO

218 California Street, S. F.

Amusements.

BALDWIN'S THEATER.

THOMAS MACUIRE ..... Manager.
CHAS. H. COONWIN ..... Treasurer.
J. P. CHAPMAN ..... Assistant Treasurer.

FRENCH FLATS.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily

BUSH STREET THEATER.

CHAS. E. LOCKE ..... Lessee and Manager

E. A. SOTHERN.

Open every evening and Saturday Matinee.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St. (rear of Ætna Foundry),

J. V. HALL,

PRACTICAL BOILER MAKER.

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girdere, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK,

Repairing promptly attended to at the lowest possible terms.

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ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL

Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machiuery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

SACRAMENTO, CAL.

PHELPS

MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Treetle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California,

SAN FRANCISCO, CAL.

Golden State & Miners Iron Works,

Manufacture Iron Castinge and Machinery of all Kinde at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

California Brass Foundry,

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SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinde, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of euperior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

J. H. WEED. V. KINGWELL.

California Machine Works,

WM. H. BIRCH, Prop'r.

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☞General Mechanical Engineer and Machinist. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturer of Brodie's Patent Rock Crushers and Steel-Faced Tappits. Agent and Manufacturer of F. A. Youse's Patent Steam Packing Rings for Steam Pistons. The best ever invented; can be applied to any Engine Piston and give entire satisfaction to those using. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

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THOMAS THOMPSON. THORNTON THOMPSON.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale St., between Mission and Howard, S. F

MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

GEORGE W. PRESCOTT. IRVING M. SCOTT. H. T. SCOTT.

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BUILDERS OF

STEAM, AIR AND HYDRAULIC MACHINERY.

Agents of the Cameron Steam Pump.

Home Industry.—All Work Tested and Guaranteed.

VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
HORIZONTAL ENGINES,	VENTILATING FANS,	PANS,
AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
SHAFTING,	PULLEYS,	ETC., ETC.

TRY OUR MAKE, CHEAPEST AND BEST IN USE.

Send for Late Circulars. PRESCOTT, SCOTT & CO.

William Hawkins,

(SUCCESSOR TO HAWKINS & CANTRELL).

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Manufacturer of

IMPROVED PORTABLE HOISTING ENGINES,

FOR MINING AND OTHER PURPOSES.

Also of the HAWKINS' PATENT ELEVATOR HOIST, for Hotele, Warehousee and Public Buildings.

Steam Engines and all Kinds of Mill and Mining Machinery.

Fulton Iron Works.

Hinckley, Spiers & Hayes.

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Works, Fremont and Howard Sts. | San Francisco, Cal. | Office, No. 213 Fremont St.

MANUFACTURERS OF

Marine Engines and Boilers,

Propeller Engines either High Pressure or Compound Stern or Side Wheel Engines.

Mining Machinery.

Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

Mill Machinery.

Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorte, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

Sugar Machinery.

Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanks.

Miscellaneous Machinery.

Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for use on land. Water Pipe, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

Pacific Rolling Mill Co.,

SAN FRANCISCO, CAL.

MANUFACTURERS OF

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ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON.

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RANKIN, BRAYTON & CO.,

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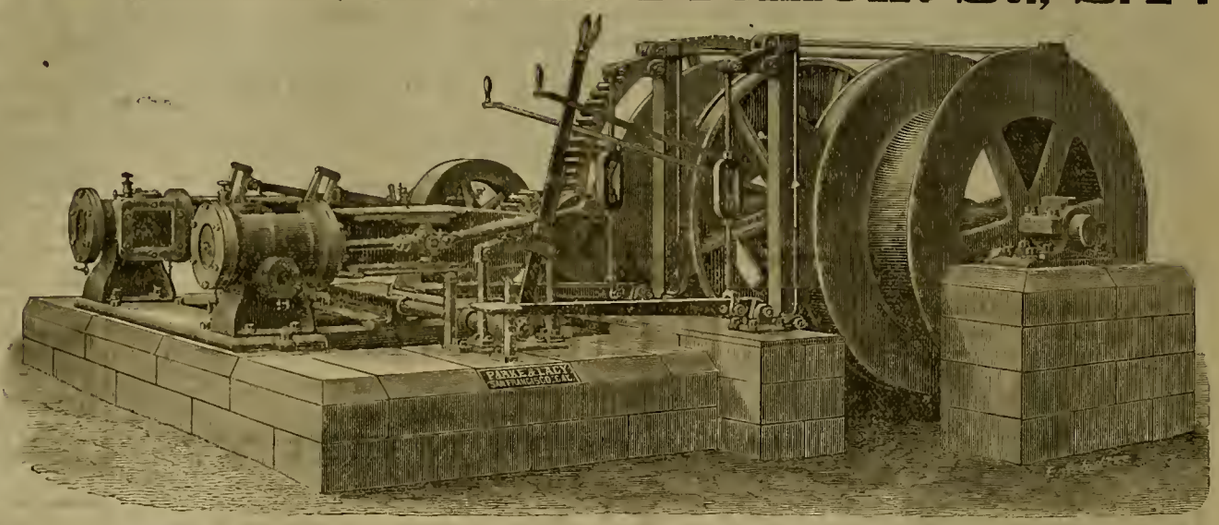

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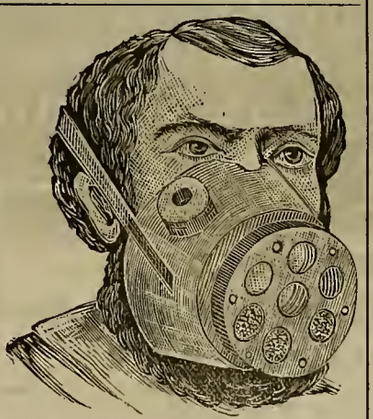

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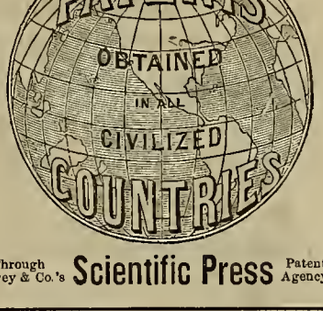

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, APRIL 3, 1880. VOLUME XL. Number 14.

The Buckeye Engine.

The Buckeye engine has been before the public for some oight years, during which time it has, whilo retaining its original goneral plan, undergone several valuahle improvements, and is now thoroughly perfected in all its parts and functione. One of these enginee is at work in this city at tho Union Box Factory, where it has given the greatest satisfaction, doing the work required with very mncb lese fuel than was formerly nsed. It is considered in the East, where it is largely in use, as the hest of ite clase, as proved in many instances hy the indicator diagrams.

Fig. 1 of the engravings gives a front view of the engine. Fig. 2 is a horizontal eection throngh the valve and cylinder, and Fig. 4 illustrates the peculiar governor. The live steam enters at A, Fig. 2, whence it passes throngh passages *a*, *a''*, and the open pistone, *D*, *D*, into the interior of the hox slide-valve, *B*, *B*, as shown hy the arrows. From the hox-valve the steam is admitted to the cylinder through ports, *b*, *b*, in its face, as these porte are alternately hrought to coincide with the cylinder ports.

The cut-off valve, which consists of two light platce, *C*, *c*, connected by rods, *C'*, works on seats inside of the main valve, as shown, and alternately covers the ports leading to the cylinder. The cnt off valve stem, *g*, works through the hollow etem, *G*, of the main valve. The exhaust takes place at the ends of the valve (as ehown hy arrow on right), into the valve chest and into the exhaust pipe, *F*, helow.

Among the features introduced since the first introduction of the engine, are the relief chamhere, *e*, *e*, in valve seat. To understand the use of theee it must he underetood that, the steam heing *inside* of the slide valve instead of *around* it (as with the common elide-valve), the tendency of the pressure of the steam in the ports, *b*, *b*, and in the cylinder is to force the valve from its seat, hut this tendency is counteracted hy the pressure of the entering steam; this pressure heing proportioned to the area of the pistons or equilibrinm rings, *D*, *d*, *D*, *d*. These pistons are made large enough to hold the valve to its seat at the moment of admission (as at left end of valve, Fig. 3), when the tendency to leave the seat is greatest. At other times the pressure on the seat would be greater than neceesary; but to prevent euch undue pressure, live steam ie admitted to the relief chambers, *e*, *e*, through small holes, *f*, *f*, in the face of the valve just after it is exhaueted from the cylinder, as shown at the right hand end of valve Fig. 3, and in turn exhausted from them, as shown at the left, jnst before steam is admitted to the cylinder. The result is a moderate and very nearly a uniform pressure on the seats at all points of travel, and the arrangement also greatly assists in the proper distribution of luhrication.

Another recent improvement consists of placing the equilihrium rings in the back cover of the valve chest, instead of in the cover of the valve, as formerly. The value of this improvement consists mainly in its rendering the equilihrium rings accessihle without removing the valve.

The remarkahle simplicity [of the governor will he apparent on inepection of Fig. 3. Two levers, *a*, *a*, are piveted to the containing case or dise at one of their ends. as at *b*, while the movahle ends aro connected hy links *B*, *B*, to ears or flanges on the eleeve of the loose eccentric *C*, eo that their outward movement in obedience to centrifngal force (as indicated by dotted lines on right hand side) advances the eccentric forward in the direction of revolution. Springs *F*, *F*, of tempered steel wire furnish tbe centripetal force. The tension of the eprings ie adjnstahle hy screws and nuts, as shown. The proper amount of tension in any given case ie that which will confine the percentage of variation due to changes of load and preseure within as narrow limits as may he desirahle—the greater the tension the less the variation—eo that if desirable it may he reduced nntil it is imperceptihle. In fact, it ie possihle to ohtain as close regulation with it as the nature of the load and other conditions outside of the construction of the engine would permit with any known method of regulation. The proper speed is ohtained hy adding more or less weight at *A*, or, within certain limits, hy shifting the weights along the levers. As a rule, the teneion is not to he changed to effect changee of speed, though slight changes of epeed may properly enough he so effected, provided no ohjectionahle degree of change of sensitiveness rcsults.

The parts are ehown in their proper position for motion in the direction of arrow; for motion in the opposite direction, the levere are changed to *c*, *c*, and the spring attachments to *b*, *b*. All of the governore are so constructed that this change can readily he made at any time.

When the earliest cut-off that the action of the regulator can produce is no earlier than is necessary to restrain the engine nnder its lightest load and greatest eteam pressure, the latest will he at five-eighths to three-fourths of the streke, where it mcets the fixed ont-off of the main valve, due to its lap and angular advance, and this whole range of adjustment is nnder complete control of the governor. To appreciate the value of thie feature, it ebould he underetood that, with single eccentric releasing gear movements, the governor can only control the time of releaee during the opening movement of the valve, wbich necessarily terminates hefore mid stroke, so that if the release is not effected before mid stroke it will not take place at all during that stroke, thus causing extravagant expenditure of steam and epasmodic irregularities in the motion.

The governor being secured directly on the engine shaft, the danager of the cngine hecoming detached from it and destroying itself and the lives of those in its vicinty, is entirely obviated. Such danger always impende when connecting mechanism between the engine and its regulator (particularly helting) is need. Instances of disaster to the engine and driven machinery, involving in many caees the loss of life, from the accidental detachment of the governor from the engine, are numeroue.

The valve-chest contains only exhanet steam; consequently the engine can he run with the cover of the chest removed, and any leakage of the valve located and detected.

This admits of the valves heing fitted tight in the first instance, which ie done hy working them under 80 or 90 pounds steam pressnre, and repeatedly scraping them until all leakage disappears; and it enahles the engineer to inspect their condition at any subsequent time. The valve ie the most practical halanced elide-valve yet devised, with which a siding cut-off valve can be nscd. The close proximity of the valve to the hore ef tbe cylinder, and of the cut-off to the main face, reduces the clearance to from 1½% to 2% of piston displacement when the stroke is twice the hore, whicb is a very important feature, as any engineer knows. The governor is hoth in appearance and effect a part of the engine itself, instead of heing a kind of extraneous disfigurement added to the engine.

A pair of diagrams from this engine were sent to Prof. Hill, of Cincinnati, to determine borse power and water oonsnmption. He saye that if the diagrams repreeent the daily average condition of performance, the engine exhibits an economy hitherto nneqnaled hy a single cylinder etationary engine. The general facts obtained from the diagram were as follows:

Dimensions of cylinder, 22x44; revolutione per minute, 70; cnt-off in parts of stroke, .152; release in parte of stroke, .987; cushion in parte of stroke, .0948; clearance in parts of stroke, .0175; Effective vacunm, inches of mercury, 20.66; initial preesure ahsolute, 78.875 lbs.; cnt-off preesure absolute, 72.50 lbs.; terminal pressnre absolute, 12.125 lbs;. counter pressure abeolute, 3.75 lbs.; mean effective pressure, 30.119 lbs.; water per indicated horee power, 16.327 lbs.; coal per indicated horse power, 1.814.

By the foregoing etatement the economio properties of this engine can he readily understood.

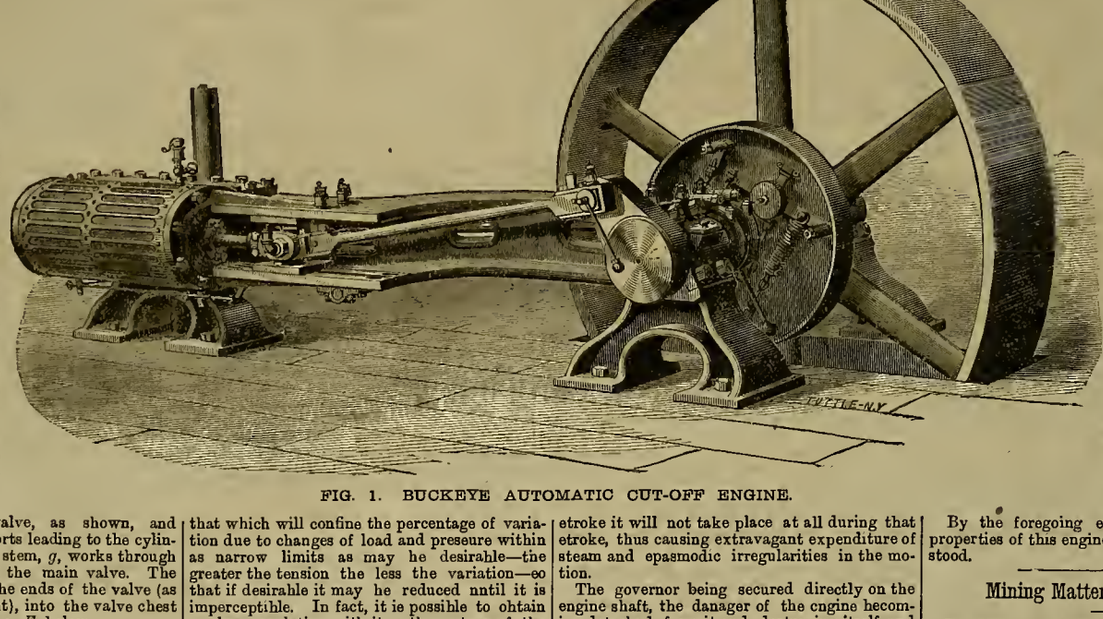

FIG. 1. BUCKEYE AUTOMATIC CUT-OFF ENGINE.

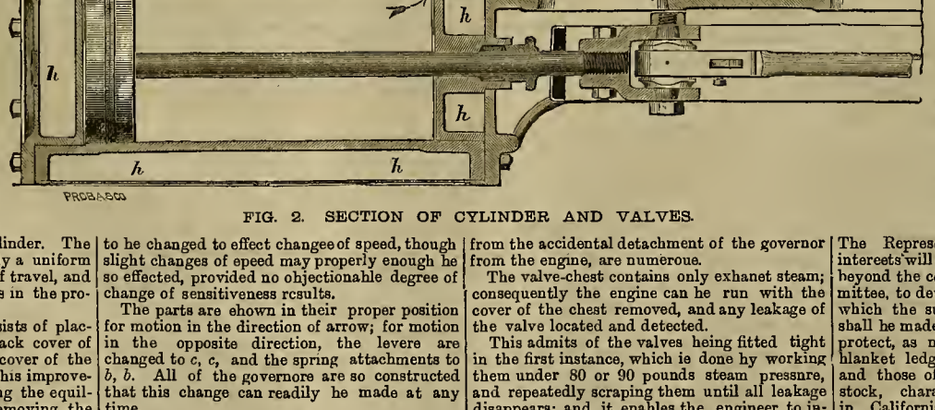

FIG. 2. SECTION OF CYLINDER AND VALVES.

Mining Matters in Congress.

It eeems, as we expected, tbat tbe cbangee proposed by the U. S. Puhlic Land Commiseion in the present mining lawe, are heing vigoronsly opposed even in Congress, especially in the matter of the contemplated aholition of the present system of ledge locations. The dispatches from Washington inform us that the Pacific Coast Senators, Representativee and delegates are in receipt of numeroue letters from conetituents interested in mining, making inquirice as to the prohahilities of favorahle action by Congress upon the recommendations of the Puhlic Land Commission, and almost uniformly proteeting against those features of the Commissioners' hill which provide for the doing away with the present eystem of ledge locations. It eeems to he practically certain, in view of the great pressure of other hueinese, and the magnitude of the qnestions involvedin a numher of the Commissioners' propositions, for radical changes in land laws, that no final action will he taken on their hill, either in the Houee or Senate during the preeent session of Congress. The Representatives of the Pacific elope intereets will endeavor, hefore the subject passes heyond the control of the House Mining Committee, to deviee eome satisfactory provision hy which the surface location of mineral claims shall he made on the pitch of the vein, and thus protect, as nearly as may he, the locator of hlanket ledges, such as are found in Colorado, and those of owners of lodes like the Comstock, characteristic of all mineral veins in California and Nevada, and most of the Territeries. In another column will he found a correspondent's views upon this subject.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

The Public Land Commission Once More.

EDITORS PRESS:—What advantages would mining operators, or the country generally, derive from mining prospectors heing driven hy ruinous legislation from the field of mineral discovery? The men who would taks their places would be "tendsr-feet" immigrants, wholly insxperienced in respect to the value of ore, or ths promise, or lack of promise, of the lodes they might heppen to find. Ths grocer and the tradesman in Eastern cities, on ascertaining that old prospectors were to he compelled to give up their claims, would, hy their agents, try to secure some of them. With the mistaken idea prevalent on the Atlantic coast, they would suppose that the possession of a silver mine insnred wealth to its owner. They wonld gladly re-locate forfeited ground; hut when they discovered the fact that it needed lahor, skill and patience to make it productive, they would ahandon everything in disgust. A change in the law wonld not bring any more capital into mining business than is coming now. Many of the locatious held at present hy prospectors were taken np years ago, when the country was infested hy hostile Indians. Is it wise or just to roh these men of their discoveries, hecause they are poor? They are waiting in hope that the day may come when capital, turning in their direction, will insure them a homestake. What crimes have these hardy pioneers committed that the Public Land Commission shonld recommend Congress to pass snch onerous laws, as to working on and patenting their mines, that they will virtually he robbed of all they possess?

The complaint, I am aware, is that prospectors take up numerous lodes and, while doing little towards opening them, demand larger prices than investors are willing to give. There is ground for this complaint, hut the evil will speedily cure itself. And are not our legislators to hlame for encouraging thie unsatisfactory state of affairs?

It is only a month ago that a bill was rushed through Congress and hecame a law before the puhlic knew anything of its provisions, the object of which wae to extend the time for doing assessment work on mines to nearly two years, in place of one. It provides that the assessment year shall not hegin until the 1st of January after a location has heen made.

Under thie stupid law, evidently passed for the henefit of some particular district, or clique of operators, a man taking up a claim on the 2d day of January, 1880, need not do any work npon it until Decemher, 1881. After passing such an objectionahle law, will Congress stultify itself hy another enactment requiring work of the value of $500 to be done and a patent to he applied for within a year?

It was while the Public Land Commission was in the throes of lahor (bringing forth a wondrous progeny of absurdities), that Congress passed the law I have alluded to. Was it an anticipatory meaeure to balk the leaked-out designe of the commission? If so, there is some hope for the prospector.

The mining law of 1872 has given general eatiefaction to practical mining men, hut every year some ignorant upstart has attempted to change its wise provisions. The appointment of a Land Commission, to revise it and make eug-geetions ae to our land laws generally, was a hlnnder akin to a crime, inasmnch as the men conetitnting that commission show hy their report to Congress that they are wholly incapable of comprehending the firet principles of the euh-ect they were to examine into.

The hest thing that can be done with that report is to place it where it will do the most good it is capahle of—under the kindling-wood of some capacious stove in the Washington capitol. J. D. EMERSLEY.

Dos Cabezas, Arizona, March 17, 1880.

Reactions of Zanthogenate of Sodium.

EDITORS PRESS:—Since the writing of the article entitled "Tests for Nickel," hy Mr. C. H. Aaron, I have followed the reaction of this reagent etill further, with the appended resnlts:

Nickel—With dilnte solutions a reddish-yellow cloudinese, deepens upon warming, soluhle in ammonia, reprodnced hy acetic acid.

Copper—In dilute solutions, a hright yellow cloudiness, with moderately concentrated eolutione upon agitation, a heavy curdy precipitate, insoluble in ammonia.

Cohalt—A dirty greenish or greenish-yellow cloudy precipitate, insoluble in ammonia.

Magnesium—A hulky white precipitate instantly soluhle in ammonia, after etanding a few minutee reprecipitates in a light, white semi-glutinous mass, soluhle in acetic acid upon warming.

Mercury—With agitation a curdy white precipitate, hoiling, coagulates into a yellowish friahle mass, which floate on the surface of the liqnid, insoluble in ammonia.

Iron—Dirty brown cloudiness, warming with acstic acid disperses the color, leaving a white cloudiness of free sulphur, with ammonia a greenish precipitate of oxide of iron.

Platinum—Bright yellow cloudiness, unlike copper, does not curdle upon agitation, ammonia changes to a flesh red.

Silver—Light yellow precipitate, curdles upon agitation, insoluhle in ammonia.

Zinc—Heavy white cloud, cnrdles upon agitation, instantly soluhle in ammonia, not reproduced hy acetic acid.

Antimony—Whits clond, soluble in ammonia, not reproduced by acetic acid.

Barium, strontium, calcium, gold and arsenic, no precipitats.

All solutions should he nentral, or nearly so.

The aqueous solution of zanthogenate of sodium decomposes in a few honrs, hecoming cloudy. The crystals may be kept ready for use in a dark cool place and in glass-stoppered hottles to exclude the air; they ars readily soluble in water. GEO. F. BEARDSLEY.

Coal Oil Product.

We collate the following from Stowell's *Petroleum Reporter*, Mar. 15th: There were produced in February 1,668,080 harrels, being a daily average of 57,520 harrels. The total stock is 9,073,562 barrels. In snmming up the business of the year (ending Decsmher 31, 1879,) and comparing it with the business of the year preceding, (ending Decemher 31, 1878,) we find:

1. That in the producing region we have added to our stock hy excess of production over shipment, 3,845,191 barrels for the year, being a daily average of 10,535 barrels.

2. That the exporters have taken petroleum largely beyond their needs and the visihle supply of the eix principal European ports at the end of the year shows an excess of ahont 600,000 harrele of refined, equal to 800,000 barrele of crude.

3. Ignoring the fact of the excessive stocks in Europe, or rather treating the foreign ehipments as consnmption, and basing calculation only on the etocke and shipments from the region, we note that the increase in production over the preceding year was 29%, while the increase in consumption was only 16%, and the excess of production for 1879 over demand for 1879 was 23%.

MICA IN COLORADO.—We learn that the mica mine near Currant creek ie again coming to the front. A company which includes among ite numhers prominent officiale of the Atchison, Topeka & Santa Fe road, has possession and will work it with a new purpose in view, which is the manufacture of a new luhricator. Ahout eight men under the euperintendence of Sol. Teal are now opening up the vast heds of mica, the large sheets heing carefully saved for nse as translucent non-conductors of heat in the many forme that ie required, while the *debris* or emall chips and fine particles of mica will he carted to the creek, a short distance off, where a mill, tbat is expected on the ground soon, will grind it into fine powder. The latter, it has been ascertained hy practical test, answers much better, when eaturated with oil, the purpose of a lubricator for railroad car axles and other heavy machinery than cotton and not heing inflammahle the heat of the constant friction does not affect it. There are other pnrpoees to which this eubstance can be advantageously put, as in the manufacture of asbestos and other fire-proof roofing materials, and the manufactnre and packing of dynamite, and it would appear as if, where there ie a whole hill of it as at that place, it could he handled to advantage. —*Fair Play (Col.) Flume, Feb. 26th.*

PROHIBITING INFANT LABOR.—The inspectors of factories in Pruseia are working herd to put down infant lahor. At Berlin, thirty-three factoriee have ceased employing children and in the others there are only nine under fourteen years of age. The same has heen the case innearly all the provinces, notahly in the district of Frankfort-on-the-Oder, where in the 330 cloth factories, employing 14,000 hands, there are now only 1,500 minors, this heing a diminution of 23% since 1876; while in the districts of Cologne, Coblentz and Treves the total number of children employed has fallen from 5,334 to 4,237, the inspectors taking great care, also, that proper sanitary arrangemente are made, and that the masters do all they can to protect workmen from accident. One curious fact hrought ont hy the inspector in Westphalia is the wandering disposition of the workmen. He instances a manufactory, employing 2,000 hands, in which from 100 to 200 of them leave every month.

DITCH ENTERPRISE.—The Calaveras *Advertiser* eays: We understand the Cataract and Wide West Hydranlic mining company of Murphye are ahout to commence digging a new ditch from the North Fork of the Stanislaus river to Murphys, a distance of ahout twenty miles, the eurvey heing nearly completed. This is qnite an nndertaking, hut we have no douht of the Cataract and Wide Weet claim remunerating them for their investment in the end. The claim consists of 160 acres, having an average depth of 100 feet, carrying gold from the surface to the hedrock. We also understand their intention is to dispose of a great deal of water to outside partiee and new minee will he opened up that formerly could not be worked owing to the lack of water. We wish the company success in their efforts.

Recent Decisions Relating to Patents, etc.

We give below brief ahstracts of decisions* rendered upon patent cases in litigation for the henefit of our readers.

Colgate ve. The Gold and Stock Telegraph Co.

U. S. Circuit Court, Southern District of New York. Blatchford, J.:

1. Ths defendant, having been enjoined from using the patented improvements, except the identical wirss and cahles then used hy it, and from authorizing others, "either in whole or in part, or alone, or in conjunction or in connection with ths defendant," from using any such wires or cahles, an agreement, under which the defendant furnished a wire emhodying the invention, contained in a cable which has been in use hy the defendant long before, and which was in actual uss hy it at the time of the service of the injunction, was a violation of the injunction.

2. An agreement involving the furnishing of the infringing device, althongh made hsfors service of the injunction, if executed after such ssrvice, is a violation thereof.

Phillipe et al. vs. The City of Detroit.

U. S. Circuit Court, Eastern District of Michigan. Brown, J.:

1. Letters Patent No. 121,544 issned to R. C. Phillips, for improvements in wooden pavements, are void for want of novelty and invention.

2. A pavsmsnt consisting of a block of wood cnt from the trunks or hranches of trees in their natural form, the hark only heing removed, laid vertically upon a hed of gravel or sand, which is also used as e filling to keep the hlocks in position, is not patentahle.

3. While the fact that a device is useful and has superseded others previously employed for analogous purposes is proper to he considered, and in some cases is decisive, it doee not of itself estahlish the fact of patentahility.

A decree will therefore he entered dismissing the hill.

COMMISSIONER'S DECISIONS.

Ex-parte Wintherlich et al.

Paine, Commissioner. Appeal from the Primary Examiner.

1. Tbe phraseology of the claim—"The process herein described of producing drop-shot from iron hy first melting the iron, then gradually pouring the molten iron upon a revolving hroom composed of parallel fibers, that are continually wet with water, which separatee the molten iron into numeroue solid glohules, that then fall into the water, and are cooled, suhstantially as set forth"—does not necessarily make the immersion and cooling of the globules of iron a part of the process claimed; bnt euch a construction of the language is not violent nor unreasonahle.

2. When the functions of a machine constitute a process, it is as legitimate to claim the process when performed by one as when performed hy several machines; hut it is irregular to claim a process without formerly describing it.

3. Where a process is substantially, though informally, shown in the description of the operation of a machine, the irregularity may he held hy the Commissioner not to he fatal to the application.

The decision of the Examiner reversed.

ACTING COMMISSIONER'S DECISIONS.

Ex-parte Tyne.

Doolittle, Acting Commissioner. Appeal from the Primary Examiner. Decided Jan 2d, 1880. Improvement in packing brooms.

1. To sustain a claim for a mechanical process, the steps taken must he novel, and some means must he described hy which the process can be carried on.

2. It is no objection to the joinder of the claim for a mechanical procese and a claim for an apparatus in the same application, that the process can he carried on hy other meaus if the use of the particular apparatus claimed necessarily involves the operation of the process.

Decision of Examiner reversed.

Hunt vs. King.

Anti-friction hearings for shafts, etc. Doolittle, Acting Commissioner. Appeal from the Examiners-in-Chief.

Drawings made hy an applicant which indicate the invention in controversy, hnt do not show all the parte nor demonstrate its capahility of use, not sufficient to defeat a patentee who was snhsequent to conceive the invention, hut who first made and successfully operated the same.

The decision of the Examiners-in-chief is reversed, and priority awarded to King.

* More complete reports of the proceedings may be found on file in the office of the MINING AND SCIENTIFIC PRESS Patent Agency, 202 Sansome street.

ACTUAL VALUE OF NICKEL COIN.—Reckoning nickel at $2 per pound, the five-cent piece is worth a cent and a quarter. It weighs 77 graine and a fraction. The proportions in the composition of it are 75% of copper and 25% of nickel. Copper is reckoned at 43 cents per pound. If, then, a nickel five-cent piece is lost, the government cleare three and one-half cents on the issue.

A MAN at Dutch Flat, picked up a rock the other day to throw at a cow. The weight of it attracted his attention, and on examination it was found to contain over a hundred dollars in gold.

The Powers of Mining Superintendents.

In the recent case of Everett against the Hukill G. & S. M. Co., of Idaho, Judge Hallett gave soms important points in his charge to ths jury. It eppears that Mr. Cushing, supcrintendent of the company, received from the pleintiff a sum of money, which the pleintiff claimed was for the purchass of ore to he produced, but which the defendaut contends was really a loan under the guise of a sele. The question was as to ths superintendent's power to bind ths company for this money. The judge in his charge laid down the following principles:

1. The superintendent of a mining company has no authority to horrow money so as to hind his principal. That power is bsyond the scops of the ordinary authority of such an agent. It can hs his, only by an authority expressly given; never hy an authority arising hy implication from his appointment.

2. But though the loan would not be hinding primarily, an after ratification hy the principal would make the contract his own, and therefore ohligatory upon him.

3. As to the mode of making ths ratification, it is not necessary that there be an express confirmation of the act of the agent. It is sufficient that the principal, knowing all the essential circumstances, remains silsnt. Silence in such a case will be construed to he assent and ratification.

4. If, howsvsr, he is not in possession of all the facts relating to the transaction, he can, in no respect, he considered as having approvsd and ratified the same.

5. A mining superintendent may hind the company to a sale of ore, a little in advauce of present production. But as such a power is liable to ahuse, there must he limite to its legitimate exercise; and it hecomes necessary to distinguish between an extreme case, as where a sale is made hy the agent of all the ore to be produced for ten years, and the case of the sale of a reasonahle quantity. It is left to the jury to say, baving taken into consideration all the circumstances of the case—the advantages of an advance sale, the neede of the company for advances of money, the daily rate of production and the extent of the future sale—wbether it is a reasonable contract for one in the position of a mining superintendent to make.

The jury hrought in a verdict for the plaintiff.

WORK RESUMED ON THE FAMOUS DEPOSIT IN CHALCHUTL MOUNTAINS.—For the first time in two hundred years the old turquois mine in Chalchutl mountain is being reopened. In 1680 work was suspended on the mine, the cause heing the caving in of the shaft and the subsequent death of some say 25 and others say 100 Indians who were at work helow. An attempt made hy the Spanish to force the Indiaus to begin again and reopen the shaft lod to a rehellion, and probahly was one of the causes which forced the Indians to an uprising and the subsequent expulsion of their rulers from the country. However, it ie hy no means certain that the story of the caving in of the mine is true. That mioe like many others in this country, may have heen filled up hy the Indians after the Spaniards had heen driven out. It is more than prohahle that this mine had heen worked for hundreds of years previous to its ahandonment, as tho turquois wae always the favorite jewel of the western trihes, and was used extensively at the time of the conquest. The extent to which these mines have heen worked may he conjectured hy the vast amount of debrie lying around the old shaft, covering no less than fifteen acres of ground. This mine is the only turquois mine on the continent, and as the gem has always a market value, it will he ere long one of the recognized sources of wealth of this Territory, when the diamond will become as common as brass is now, and turquois, on account of ite rarity, will he in demand and will command a high price.—*New Mexican.*

MINING STATISTICS.—Mr. Clarence King, the head of the Geological Survey, makes a request of Congress which the rapid increase in mining investments throughout the country will cause to be received with general interest. Mr. King points out the fact that only a portion of our great mineral deposits are to he found on the public lands, to which the survey is restricted. An accurate and exhaustive presentation of the mineral resources and prodncts of the country cannot be made unlese the jurisdiction ie extended, as he proposes shall be done hy joint resolution, to the whole territory of the United States. Hie idea would he, he states, to issue an annual volume of statistics on the subject. It is needless to say that such a volume would he sought hy the public with greater interest than usually attaches to Government puhlications. Mr. King predicts for some time in the futnre an annual mincral yield of $1,000,000,000.—*New York Tribune.*

SISKIYOU COUNTY NOTES.—H. C. Cory writes us as followe: More hullion will be ehipped from this county this year than for many years. Fourteen quartz mills are now running; number of stamps in all 118; several new mills will he hnilt. D. B. Kingery hae a seven-foot ledge in his mine on the French Creek lead at a depth of 200 feet, which shows well in free gold; this gives new life to the French Creek mining district. The report is good all over the county; hundreds of new mines are heing opened with very flattering prospects.

MECHANICAL PROGRESS.

Then and Now.

Owing partly to the improvement in tools and shop appliances, and partly to the system of subdivision of labor, there is no parallel by which the workman of to-day can be gauged or compared with the workmen of thirty or forty years ago. Then the apprentice was taught—crudely, perhaps, but still taught—all the mysteries of his calling, from the preparation of the crude material to the finish of the completed result. The carpenter hewed his timber from the tree trunk or limb by means of chalk lins and broadax. He bored, and mortised, and cut tenons, erected the frame of the building, boarded and shingled, and clapboarded and lathed. The blacksmith shod horses and oxen, tired wheels, made bolts and nuts, chipped and filed and drilled, forged and tempered axes and chisels, and performed numberless jobs of a variety of forms and for a variety of purposes. The machinist sometimes made his own patterns and often his own tools, worked at the vise and the planer, the lathe and the forge, and was ready to undertake any job, from repairing a broken stove to building an engine.

Now, timber is sawed and not hewed; mortises and tenons are machine cut; houses are built by the shinglers, the lathers and the joiners, as well as by the carpenters; and the doors, windows, window and door frames and sashes are factory built. The horseshoer does nothing else. The forger of steel seldom works iron. The tool maker is nothing but a tool maker. The machinist is a bench man, a lathe man, a planer, a fitter, or he has a specialty in cotton machinery or woolen, or never works but on steam machinery.

It cannot be expected that the man who has worked only in a certain department will be entirely at home in others; but, on the other hand, he who has worked at all branches will not be likely to be an expert in any one branch. In versatility and in contriving makeshifts, he who learned his trade when the arts were young, and performed a portion of all the work, is better than the specialist; he may be an invaluable man in a crisis. But the latter can prepare a room for the plasterer with much greater rapidity and in better shape than the carpenter who turns from making a door to lathing a room. The tool forger can temper steel better than the blacksmith who turns from the forging of a mill crank to the tempering of a turning tool. The machinist who has worked for years on steam engines can sooner put a disabled engine to work than one who learned his trade at building cotton machinery. In the one case, the man is an expert; in the other, simply a workman.—*Scientific American.*

The Vibration and Fire Risk of High Factory Buildings.

A late article, by a Boston underwriter of textile mill risks, states that in many New England mills the vibration will, in the loftiest structures, cause water to slop over from a pail two-thirds full, if the pail be placed on one of the highest floors. Gas pendants show corresponding vibration (plainest when loosely hinged) by swaying two or three inches. Such tremor, though in less degree, has been noticed in heavily built four-story stone mills, and even in those having iron floors with brick arches. In one of the last-named kind it became necessary, before satisfactory work could be done, to put wooden blocks in the walls, upon which the iron girders might rest. This jarring is not only hard on shafting and hangers, but especially detrimental to cog-wheels and all delicately set machinery.

The *American Exchange and Review*, commenting on these facts, points out that there is another view of this subject, increasing the disadvantages of vibrations. It is in accordance with natural laws, just as iron constantly jarred becomes more granular in form and weaker in cohesive force, that walls of brick or stone subject to constant tremor shall become disintegrated and weakened. In such a case the work of the fire is partly done before ignition commences. The buildings may not fall before a fire, as in the case of the large Pemberton mills some years ago, but when fire attacks a factory whose walls have for years been shaking, as with a chronic chill, the whole building is likely to fall into one mass of ruin early in the fire, or else the fire be much more extended by the falling of some of the long-shaken walls, than if they had been able to resist the suddenly added molecular vibrations of intense heat. There is undoubtedly a difficulty in strengthening wooden girders with iron rods and trusses, for in case of fire such compound girders are weaker than one of wood only, because, trusting to the iron, they are frequently overloaded; and it is during strong heat that the weakness of iron becomes apparent.

Rectangular iron knees, to brace girders to walls are objectionable, because in a fire when the interior pillars yield, the ends of girders in the wall may so hold that the leverage of the long timber will pull the walls inward. It should be remembered that by the intense heat of a fire heavy walls are temporarily weakened, but if strong enough to stand, their strength returns after cooling, and they can often be used in case of rebuilding or restoring. Synchronous vibration is very dangerous to any structure, and for this reason platoons of soldiers are never allowed to march over even the strongest bridge; they must "break step" and walk with irregular trend.

It is a fact that in mills of ordinary construction a safe form for stability and for low rate of fire destructibility, is two stories high, extending over sufficient space to give the room required. It is safe to assume that equal cubic content, with double the base area, has but one-half the fire loss liability of the double altitude, with conditions otherwise equal. Add to the fire result of difference in hight the effect of the greater vibration of the higher structure, and the hazard of the higher structure is yet further augmented.

It is self-evident that a two-story mill, even if not properly built, would naturally shake less; and for several other reasons the walls are more likely to stand after fire, than in case of factories having many lofty stories. A one-story mill with cement floor—and especially if all the roof be iron—is the safest fire risk any manufactory can offer; but next to it comes the two-story mill, which, for many kinds of work, is far more convenient and easier to operate than the other, while always as much cheaper as a floor is cheaper than a roof; and in a city but half the amount of costly ground would be needed. If such a two-story mill had, at proper intervals, strong dividing brick walls extending several feet through the roof, and iron doors for communication, sliding into the wall, not only would each division wall brace the building so as to prevent vibration, but it is probable that in case of fire only one compartment, and perhaps only one story of that compartment, would be seriously injured.

A New Metallic Compound.

Dr. Granville Cole has drawn attention, in a paper recently read before the British Society of Arts, to a new metallic compound which, he states, possesses properties that are likely to make it valuable in many branches of the arts.

It was discovered some time since, by J. Berger Spence, that the sulphides of metals, combined with molten sulphur, form a liquid, which on cooling becomes a homogeneous mass of dark gray color and possessing great tenacity, while it is not affected by the atmosphere, and resists acids and alkalies well. It has a comparatively low melting point, 320°F., and expands in cooling so that it fills molds very accurately, so well indeed that the marks of a finger on a plate of glass are reproduced. Experiments are being made to test its adaptability for printing and stereotyping purposes, and casts from gelatine molds have been made without destroying them.

It has been tried by the South Metropolitan gas works for joining gas pipe, with such success as regards the tightness of the joint and the ease and rapidity with which it is applied, that it has been adopted by the engineer of that corporation. Over lead it has the advantage of being much cheaper and of doing away with caulking, while its property of being a bad conductor of heat suggests other important uses. For the specimens exhibited iron pyrites, containing lead and zinc, were used, the material obtained being capable of receiving a polish. Various colors, such as the patina of bronze, the dark blue of steel and the appearance of silver and gold, have been imparted to it; so that there is some promise of its being available for the reproduction of works of art.

SPEED OF LINE SHAFTS.—The tendency at the present time is to increase rather than to diminish the speed of line shafts. Good practice is to run shafts for machine shops at 120 revolutions per minute; for wood-working machinery, at 250; and for cotton and woolen mills, at from 300 to 400 revolutions. Hollow or pipe shafting has been made to run very satisfactorily at 600 revolutions per minute. This kind of shafting, however, is too costly to be generally introduced. These speeds are not too high for successful practice. Belts can be run safely at 500 to 600 feet per minute; but on say 6-inch pulleys, lose about two-fifths of their cohesion by centrifugal force, and are a little uncertain in driving action. Ordinary cast-iron pulleys are safe also at these speeds, if well made and not too large. A 4-foot pulley should not be run over 400 revolutions per minute, according to the experience of a good engineer; but with wooden rim, properly made, a higher speed may be run with safety. We mention speeds in connection with pulleys and belts, because these are more liable to be affected by high velocities than shafts are, the belting losing pulley contact, and the pulleys losing cohesion by reason of the centrifugal force developed by high speeds.—*Mechanic and Builder.*

RULE for finding the weight necessary to put on a shift valve lever, when the area of valve, pressure, etc., are known: Multiply the area of the valve by the pressure in pounds per square inch; multiply this product by the distance of the valve from the fulcrum; multiply the weight of the lever by one-half its length; then multiply the weight of the valve and stem by their distance from the fulcrum; add these last two products together, subtract their sum from the first product, and divide the remainder by the length of the lever; the quotient will be the *weight* required.

SCIENTIFIC PROGRESS.

Instinct the Result of Inherited Actions Unconsciously Performed.

Most naturalists, writes Mr. Charles Darwin in *Nature*, appear to believe that every instinct was at first consciously performed; but this seems to me an erroneous conclusion in many cases, though true in others. Birds, when variously excited, assume strange attitudes and ruffle their feathers; and if the erection of the feathers in some particular manner were advantageous to a male while courting the female, there does not seem to be any improbability in the offspring which inherited this action being favored, and we know that odd tricks and new gestures performed unconsciously are often inherited by man. We may take a different case, (which I believe has been already advanced by some one), that of young ground birds which squat and hide themselves when in danger, immediately after emerging from the egg; and here it seems hardly possible that the habit could have been consciously acquired just after birth without any experience. But if those young birds which remain motionless when frightened were oftener preserved from beasts of prey than those which tried to escape, the habit of squatting might have been acquired without any consciousness on the part of the young birds.

The reasoning applies with special force to some young wading and water birds, the old of which do not conceal themselves when in danger. Again, a ben partridge, when there is danger, flies a short distance from her young ones and leaves them closely squatted; she then flutters along the ground as if crippled, in the wonderful manner which is familiar to almost every one; but, differently from a really wounded bird, she makes herself conspicuous. Now, it is more than doubtful whether any bird ever existed with sufficient intellect to think that if she imitated the actions of an injured bird, she would draw away a dog or other enemy from her young ones; for this presupposes that she had observed such actions in an injured comrade and knew that they would tempt an enemy to pursuit.

Many naturalists now admit that, for instance, the hinge of a shell has been formed by the preservation and inheritance of successive useful variations, the individuals with a somewhat better constructed shell being preserved in greater numbers than those with a less well constructed one; and why should not beneficial variations in the inherited actions be preserved in like manner, without any thought or conscious intention on her part any more than on the part of the mollusk, the hinge of the shell of which has been modified and improved independently of consciousness.

CONCERNING carbon bisulphide, which has, for some time past, been gradually attaining to a state of importance in the useful arts, Prof. Mallet gave some interesting facts in his review recently, of the industrial applications of chemistry, published in the *American Chemical Journal*. After noticing that, in the ordinary practice of manufacture, a large quantity of free sulphur is covered over with the sulphide, which requires to be separated by means of subsequent refining, and recommending, to avoid this, the passage of the mixed vapors through a second and even a third retort containing glowing carbon, he gives a number of interesting facts respecting its industrial uses. At first, this compound was used in the arts almost solely by the manufacturers of rubber; but it has lately acquired considerably increased importance, as furnishing the means of dissolving out fats and oils from various materials which could not be treated with equal advantage in any other way. Thus, for example, from oil-seed cakes, from the marc of olive-oil pressing, from woolen rags and waste, from cotton waste used in wiping machinery and packing stuffing-boxes and the like, and from bones from which gelatine and phosphates are afterward to be made, large quantities are extracted. It has also come to be used to some extent in the manufacture of the sulpho-carbonates used for the destruction of the phylloxera.

ELECTROTYPING WITH IRON.—Herr Bottger describes a process for steeling copper plates by electrolysis. One hundred parts of ferrous-ammonia sulphate, together with 50 parts of sal-ammoniac, are dissolved in 500 parts of pure water, a few drops of sulphuric acid being added to acidulate the solution. The copper plate is connected to the negative pole of a battery of two or three Bunsen elements, an iron plate of equal size being employed as an anode. The solution is maintained at from 60° to 80°. The deposit of iron is of a hard, steel-like quality, and is very rapidly formed.

PHONOGRAPHIC MATRICES.—M. Lambrigot has invented a modification of Edison's phonographic matrices, by substituting stearine for the tin foil, and electrotyping the impressed surfaces. It has been suggested that these electrotypes, which can be made very cheaply, may render great service in the study of foreign languages, for they preserve indefinitely and repeat as often as may be desired words that are the most difficult to pronounce correctly. A true speaking dictionary might thus be made, an undertaking which the wildest fancy would not have dreamed of a few years ago.—*Nature.*

A New Distance Finder.

Mr. T. A. Matsdaira, C. E., a native of Japan, but now residing in New York, has recently invented several important improvements in surveying instruments. One of which is a new "distance finder," which consists of a finely graduated brass or steel plate, two feet in length. It has a slot in the center and a movable support, to which a telescope is attached, which may be firmly fixed by a thumb-screw. If, for instance, the distance of an object across a lake is sought, the instrument, which has five spirit levels to secure perfect accuracy, is placed in position, and the telescope is eighted upon the object and firmly attached to the support. It is then moved in a slot two feet to the other end of the plate, and another object is now noted through it. With this object in mind, the telescope is moved back to its first position, and turned until this second object is seen through it. The variation from the line of its first direction gives an angle of a triangle, at the other two angles of which are the two objects. By means of the first mentioned instrument the second angle and sides of the triangle are measured, and hence the distance of the first object is secured.

Another device for finding the distance of an object in a different way is also described by Mr. Matsdaira. The plate, two feet in length, has a fixed telescope at one end. At the other end, upon the arc of a circle, whose sections are four feet, another telescope moves, and has a pointer, which directs to a graduated scale at a tangent to the arc. When the two telescopes are both directed to the distant object, the pointer indicates a certain number on the scale, which is divided down to 1-32 of an inch. A table accurately prepared shows to what distance these numbers refer, and by looking on it the distance is ascertained.

CRYSTALLIZED CHLOROPHYL.—The following note by Mr. A. Gautier, on the method of obtaining pure crystallized chlorophyl, has been communicated to the Academy and was read at a late meeting of the French Photographic Society, in consequence of its having been shown by MM. Becquerel, Croe, and Ducos du Hauron, that that substance, when added to a sensitive film, enabled the latter to reproduce colors hitherto considered out of the reach of photography: "To obtain the chlorophyl I take the green leaves of spinach, cress, etc., and pound them in a mortar, adding to the pulp a little carbonate of soda until the liquid is neutralized, and then I submit the whole to strong pressure. The mass thus obtained I digest in alcohol of 55° C., and I again pass it through the press; then I digest it once more in alcohol of 83° C. By this process the chlorophyl is dissolved, along with all the fats, the wax and the coloring matters. To separate those, the liquid is filtered, and then placed in contact with powdered animal charcoal previously well washed and raised to a high temperature. At the end of four or five days the liquid will be found to have turned a greenish or brownish yellow, and it will contain all the impurities. It is decanted off, and the charcoal is collected in a tube plugged with cotton wool, where it is washed with alcohol at 65° C. This liquid takes up the yellow crystallizable substance which is always found to accompany chlorophyl, and which seems to have some intimate relation with it. On the charcoal thus deprived of the yellow substance, or containing mere traces of it, there is found anhydrous ether, or better still, light petroleum oil, which does not dissolve the yellow substance. These solvents take up the chlorophyl and yield a deep green liquid, from which the latter can be crystallized out by slow evaporation in the dark."

METEORIC IRON IN SNOW.—Observations of snow collected on mountain tops, and within the Arctic circle, far beyond the influence of factories and smoke, confirm the supposition that minute particles of iron float in the atmosphere, and in time fall to the earth. By some men of science these floating particles of iron are believed to bear some relation to the phenomena of the aurora. Gronemann, of Gottingen, for instance, holds that streams of the particles revolve around the sun, and that, when passing the earth, they are attracted to the poles, thence stretching forth as long filaments into space; but, as they travel with planetary velocity, they become ignited in the earth's atmosphere, and in this way produce the well-known luminous appearance characterizing auroral phenomena. Prof. Nordenskjold, who examined snow in the far north, beyond Spitzbergen, says that he found in it exceedingly minute particles of metallic iron, phosphorus and cobalt.

A NEW USE FOR THE TELEPHONE.—The telephone has been found by Herr Niemoller capable of determining very quickly and accurately the resistance of liquids. It is substituted for the galvanometer in a galvanic bridge, and an induction current is used; then, if the resistances compared are a large liquid resistance on the one hand, and a Siemens resistance box on the other, so that the electro-dynamic constants of the branches are very small; if, further, a German silver or platinum wire be used as measuring wire, it is found that in the position where the galvanometer shows no deflection, the tone in the telephone has a well-marked minimum of intensity. Supposing the liquid resistance has 2,000 units, a variation of it, even 4 units, reveals itself in a displacement of the minimum position.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 11		Week Ending Mar. 18		Week Ending Mar. 25		Week Ending Apr. 1.	
Alpha	8½	8	8¾	7	8½	7¾	7½	....
Alta	3.50	3½	3.55	3.35	4	3¾	3.70	3.40
Andes	75c	50c	65c	45c	75c	55c	80c	60c
Alps	....	....	....	....	....	....	....	....
Argenta	95c	60c	70c	65c	70c	65c	1.10	65c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	60c	....	....	....	....	....	....	....
Baltimore Con	25c	....	40c	25c	35c	30c	25c	....
Belcher	12⅜	9¼	8¾	5½	6	5½	4¾	3.55
Belmont	20c	....	20c	15c	30c	15c	20c	....
Best & Belcher	10¾	9¾	9½	8½	10½	10	10	9¾
Bullion	5⅜	4.55	4.60	4.35	5	4.40	3.90	3½
Bechtel	2.35	2	2.05	2	2	....	1.85	1.80
Belle Isle	1½	1¼	1¼	1.10	1.20	1.05	1.20	1.05
Bodie	9	8¾	8¼	7¾	7½	7¼	11	9
Benton	2.45	2.20	2.25	2	2.40	2.10	2.60	2.30
Bulwer	9½	8¾	9¼	9	9¾	9	7¾	7½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1½	80c	1	70c	80c	60c	90c	70c
Belvidere	3.80	2¾	3¾	3¼	3.40	3	3	2.90
Booker	90c	60c	65c	50c	60c	55c	55c	50c
Caledonia	1.40	1.15	1¼	1.05	1.40	1.05	1.10	1
California	3.65	3.40	3.56	3¼	3¾	3.15	3.05	3
Challenge	1¾	....	1¼	1.55	1½	1¼	1.60	1½
Chollar	6¾	5¾	6	5½	6¾	6	5¾	5¼
Confidence	7¼	7	7¼	6	7	6	6¾	6¼
Con Imperial	65c	55c	55c	50c	55c	50c	50c	45c
Con Virginia	3.70	3½	3.60	3.40	3.55	3.35	3.45	2.90
Crown Point	4½	3.40	3.30	2.80	3½	2.95	3	2.60
Con Washoe	....	....	....	....	....	....	....	....
Champion	60c	25c	40c	35c	40c	30c	1.20	45c
Concordia	50c	45c	50c	40c	50c	....	1¼	80c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	60c	40c	55c	40c	1¼	75c	60c	70c
Eureka Con	15¾	15	17½	14¾	21¾	18¼	19¾	19¼
Exchequer	3.60	3	3.10	2.35	3½	3	3	2½
Endowment	20c	15c	15c	10c	10c	....	10c	5c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1.40	1¼	1.70	1.30	1¾	1¼	1.55	95c
Gila	25c	....	25c	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodshaw	50c	45c	40c	30c	40c	35c	45c	35c
Gould & Curry	6¾	5	5¾	4.90	6¾	5¾	5¾	4¾
Hale & Norcross	6¾	5¾	5¾	5¼	6¼	6	6	5¾
Hillside	1.40	1.10	1	75c	90c	75c	....	....
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	1¼	1¼	1.20	1	1	....	1.05	1
Julia	1.40	1¼	1.15	1.05	1¼	1.10	1.10	1
Justico	1.55	1	1.80	1¼	2	1.55	1.70	1.55
Jackson	2¼	2	4	3¼	4¼	4	4¼	3¼
Joe Seates	....	....	....	....	....	....	....	....
K K Con	3	....	3¼	3¼	4	3¼	4	3¼
Kentuck	3¼	3	3	....	3	....	3	....
Kossuth	....	....	10c	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	60c	30c	40c	5c	45c	20c	....	....
Lady Wash	75c	55c	60c	....	80c	65c	85c	....
Leopard	10c	....	10c	....	10c	....	....	....
Leviathan	15c	10c	15c	10c	40c	35c	35c	....
Leeds	50c	....	60c	50c	50c	....	....	....
Loe	....	....	....	....	....	....	....	....
May Belle	35c	25c	30c	....	25c	15c	25c	20c
Modoc	40c	....	40c	....	....	....	....	....
Manhattan	1.55	1.30	1	90c	1	90c	85c	80c
Martin White	85c	75c	75c	....	80c	65c	35c	....
McClinton	1	65c	80c	65c	80c	65c	85c	65c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	16¾	14¾	14¾	13¾	14¾	14	14	13
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	40c	35c	45c	35c	45c	35c	35c	27c
Northern Belle	16¾	16¼	13	16¼	18½	17¾	17½	16¾
New Cosso	....	....	....	....	....	....	....	....
Navajo	30c	....	35c	30c	35c	25c	35c	25c
Occidental	1.05	90c	90c	70c	1.30	95c	1.40	1
Ophir	18¾	17½	18¼	17	18¾	17½	17½	16¾
Oriental	....	....	....	....	50c	....	....	....
Overman	6¼	5	5¼	1.95	2.60	2	2.05	1.80
Panther	....	....	....	....	....	....	....	....
Phenix	2	....	1	....	....	....	....	....
Phil Sheridan	20c	....	....	....	10c	....	....	....
Potosi	4.65	4	4.30	4¼	4.70	4.10	3.85	3¾
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1	95c	1	85c	85c	75c	75c	40c
Richer	....	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	30c	....	....	....	....	....
Savage	6¾	5	5¾	5	6¾	5¾	5½	5.05
Seg Belcher	17¾	17	18	14	15	12	12	....
Sierra Nevada	23¾	21¾	21¾	20¾	21¾	20¾	21¾	19¾
Silver Hill	1	75c	1	75c	1	80c	70c	60c
Silver King	7	....	7	6	6	5¾	6	5¾
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	2	1¼	1¼	1.10	1.10	1	1.15	1
Scorpion	3¼	3	3	2.80	3½	3	3	2.85
Solid Silver	....	....	40c	20c	....	....	....	....
South Bodie	80c	75c	75c	60c	60c	55c	55c	50c
South Standard	35c	20c	25c	20c	25c	20c	25c	....
Star	20c	....	25c	20c	25c	....	25c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1¼	1¼	1.60	1.35	1¼	1.40	1¼	....
Tioga Con	3	2¾	2.70	2.30	2.60	2.40	2¾	2½
Tiptop	5	4¾	4.30	4¼	4¼	4	....	....
Trojan	15c	10c	....	....	....	....	....	....
Union Con	40¼	36¼	37	35	38¾	36¼	38¾	35¾
Utah	12	10¾	10¾	9¼	10¾	9¾	10	6¾
Vermont Con	....	....	....	....	....	....	....	....
Ward	2	1¼	1.65	1¼	1¼	1.65	1¼	....
Wells-Fargo	5c	....	....	....	5c	....	....	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	9¼	8¾	8¾	7¾	8¾	7¾	8¼	7¾

Sales at S. F. Stock Exchange.

Monday A. M., Mar. 29.

380 Andes.....80c@75
280 Alta.....3¼@3.40
20 Alpha.....7¼
1150 Belcher.....4¾@4.40
420 Baltimore Con.....25c
500 Benton.....2.30@2.40
575 Bullion.....3¾@3.55
90 Best & Belcher.....9¾
625 California.....3.05@3
8 Caledonia.....1.65
125 Challenge.....1.60@1.55
540 Crown Point.....2@2.00
110 Confidence.....7@6¾
295 Con Imperial.....50c
150 Con Virginia.....3.20
150 Chollar.....5¾
200 Exchequer.....2.30@2
53 Essex.....1¼
400 Golden Gate.....65c
130 Gould & Curry.....4@4.80
90 Hale & Nor.....5¾@5¾
270 Justice.....1.55
175 Julia.....1@1.05
30 Kentuck.....3
410 Lady Wash.....65c
280 Mexican.....13¾@13
600 Mackey.....10c
415 N Bonanza.....1¾@1.20
445 Ophir.....17¼@16¾
285 Overman.....1.90@1.85
200 Occidental.....1
80 Potosi.....3.85
30 Savage.....5
400 Silver Hill.....60@70c
170 Solid Silver.....15c
200 Scorpion.....3
405 Sierra Nevada.....19¾@20
100 Trojan.....10c
80 Utah.....9¾@9¾
455 Union Con.....35¾@36
200 Ward.....1¼
510 Yellow Jacket.....7¼@7¾

AFTERNOON SESSION.

300 S Bodie.....50@56c
200 South Standard.....25c
1480 S Bulwer.....1.10@1
200 Star.....25c
475 Argenta.....65c
250 Belmont.....20c
400 Belding.....75c
150 Bodie.....9
30 Bechtel.....1.85
280 Belle Isle.....1.20@1¼
200 Boston.....1@1.05
700 Booker.....60c
90 Black Hawk.....90c
255 Belvidere.....3
1 Bulwer.....73@7¼
1455 Champion.....50@45c
200 Concordia.....80c
50 Caledonia (B H).....2¾
1200 Day.....80@90c
150 Dudley.....70c
1000 Endowment.....10c
175 Eureka Con.....19¾@19¼
520 Grand Prize.....1.55@1¾
1520 Goodshaw.....35c
200 Independence.....1@1.05
800 Jupiter.....2.15@2
20 Jackson.....4¼
140 K K Con.....4
300 McClinton.....65c
20 Mt Potosi.....1.70
200 Metallic.....2¼
100 M White.....3.85
190 Mono.....8@7¾
790 Mammoth.....2.60@2¾
140 Northern Belle.....16¾
600 N Belle Is.....35c
30 Noonday.....3.60
200 Navajo.....25c
1120 Oro.....6¾@6
650 Orient.....5c
1450 Queen Bee.....30c
150 Real del Monte.....1
50 Raymond & Ely..75@65c
60 Scorpion.....3
200 South Standard.....25c
750 Summit.....1¾
60 Syndicate.....1¾
300 S Bodie.....50@56c
200 South Standard.....25c
1480 S Bulwer.....1.10@1
200 Star.....25c

California Board—Latest Sales.

Wed'sday A.M., Mar. 31.

100 Ætna.....7c
10 Alpha.....7¼
30 Alta.....3¾
1100 Atlantic.....3@3c
100 Argenta.....65c
120 Black Hawk.....95@90c
90 Belcher.....4.55@4.40
30 Best & Belcher.....9¾@10
20 Benton.....2.25
100 Bodie Q.....45c
50 Bullion.....3.90@3.95
65 California.....2.95@3
100 Curtiss.....70c
170 Champion.....1¼
30 Chollar.....5¾@5¾
110 Con Virginia.....3.40@3.20
200 Con Imperial.....50c
115 Crown Point.....3@3.05
340 Goodshaw.....42@47c
30 Gould & Curry.....5¼@5¾
45 Hale & Nor.....5¾
20 Justice.....1.65
20 Lady Wash.....67½c
100 Leviathan.....35c
20 Mexican.....14
60 Occidental.....1.30
30 Ophir.....17¾@17½
25 Overman.....2
30 Potosi.....3.85@3.90
20 Savage.....5¾
130 Scorpion.....3@2.95
100 Senator.....14c
30 Sierra Nevada.....20¾@20¾
100 Silver Hill.....75c
100 S Bodie.....65c
200 Trojan.....12½c
30 Utah.....9¾
30 Union.....37¾@37
120 Ward.....1.60
100 W Comstock.....20c
200 Wells-Fargo.....3c
30 Yellow Jacket.....8¾@8½

AFTERNOON SESSION.

30 Alta.....3.55
100 Argenta.....62½c
30 Alpha.....7¼
100 Atlantic.....4c
20 Belcher.....4.35@4¼
20 Best & Belcher.....9¾
30 Benton.....2.55@2¾
100 Black Hillier.....30c
25 Bullion.....3.90
25 Chollar.....5¾
55 Crown Point.....2.95@3
50 Con Virginia.....3¼@3.10
200 Con Imperial.....50c
20 Caledonia.....1.10
300 Endowment.....10c
100 Enterprise.....1¼@1.55
70 Exchequer.....3
300 Goodshaw.....45c
20 Gould & Curry.....5¾
20 Hale & Nor.....6¼@6¾
130 Julia.....1.10@1.05
235 Belle Isle.....1¼@1.05
295 Bodie.....10¾@11
165 Bechtel.....1.85@1.80
160 Bulwer.....7¾
525 Black Hawk.....75@70c
600 Booker.....55@50c
350 Boston.....1¼
670 Belvidere.....3@2.90
576 Concordia.....1¼
730 Champion.....20
70 C Facific.....21@2.40
250 Caledonia (B H).....2¾
600 Day.....75@70c
100 Dudley.....70c
300 Jupiter.....2¼@2.20
300 K K Con.....3¼
200 Metallic.....2.10
50 Mt Diablo.....2¼
330 May Belle.....25@20c
230 Mono.....8@7¾
260 Mammoth.....2.55@2¾
260 Manhattan.....80@85c
Northern Belle.....15¾
540 N Bonanza.....35c
1075 N Belle Is.....25@20c
25 Noonday.....3.60
400 N Noonday.....3.85@4
650 Orient.....5c
360 Oro.....86@4
600 Paradise.....60c
640 Queen Bee.....35@30c
1600 Raymond & E....65@60c
100 Real Del Monte.....1.10
50 Red Cloud.....50@25c
145 Sumit.....1@1.15
150 Silver King.....5¼
600 S Bulwer.....90@70c
320 Tioga.....2¾
600 University.....30c
250 Wales.....3¼@3.05

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Mar. 25.

35 Alta.....3¼
350 Andes.....60@65c
20 B & Belcher.....10
230 Bullion.....4.40
100 Benton.....2.20
600 Baltimore Con.....30c
910 Belcher.....5@5¼
200 Con Virginia.....3.45
20 Chollar.....6¼
55 California.....3.15
230 Crown Point.....3.10
150 C Dorado.....1¼
50 Caledonia.....1.10
20 Challenge.....1.55
300 Con Imperial.....55c
50 Essex.....1.90
85 Exchequer.....3.05@3
100 Flowery.....15c
60 Gould & Curry.....5¼
300 Golden Gate.....70c
100 Hale & Nor.....6¼
295 Julia.....1.15@1.10
110 Justice.....1.55@1.60
120 Kentuck.....20c
100 Lady Wash.....65c
100 Lady Bryan.....45c
370 Mexican.....14
459 Mackey.....10c
480 N Bonanza.....30c
190 New York.....1.10
20 Ophir.....17¾@17½
560 Overman.....2.05@2
150 Potosi.....4.10
90 Savage.....5¾
30 Sierra Nevada.....20¾
130 Scorpion.....3
60 Silver Hill.....80@85c
35 Utah.....10@9¾
70 Union.....36
250 Yellow Jacket.....7¼@7¾

AFTERNOON SESSION.

470 Addenda.....60@65c
500 Alhion.....25c
600 Altas.....5c
100 Belmont.....20c
570 Belle Isle.....1.20@1.05
6 Bechtel.....1.85
130 Belvidere.....3.35@3.30
300 Black Hawk.....1
200 Boston.....85c
50 Booker.....65c
40 C Pacific.....21
1145 Champion.....1.05@1
50 Caledonia (B H).....2.70
100 Dudley.....70c
1125 Day.....90c@1
300 E Mt Diablo.....1.10@1
100 Endowment.....10c
160 Eureka Con.....20c@20¼
460 Grand Prize.....1.60
760 Goodshaw.....40@35c
300 Glynn Dale.....10c
350 Holmes.....1¼
100 Independence.....1
200 Jupiter.....2.45@2¼
200 Leopard.....10c
300 Metallic.....21@2.30
450 McClinton.....65@70c
100 May Belle.....20c
250 Martin White.....50c
320 Mammothj.....3
60 Mono.....6¾
10 Mt Diablo.....2¾
50 Mt Potosi.....1¾
80 Northern Belle..18@21¼
200 Navajo.....35c
160 Noonday.....3.60
1600 Oro.....1.90@2
100 Orient.....5c
100 Paradise.....65@60c
450 Atlantic Bo.....25@30c
100 Real del Monte.....1
200 Raymond & Ely.....75c
75 Summit.....1¼
1025 S Bodie.....65@50c
210 Silver King.....6@6¼
80 Syndicate.....1¼
200 S Bulwer.....1.40
250 Tiptop.....4¼@4.15
100 Tuscarora.....50c
140 Tioga Con.....2.70@2¾
130 Wales.....3.40

Thursd'y A. M., Apr. 1.

130 Andes.....65c
150 Albion.....85@60c
1650 Atlas.....5@7c
270 Benton.....2.60@2.55
60 Bullion.....3.60@3.55
50 Best & Belcher.....9¾
455 Belcher.....3.85@3.55
50 Booker.....55c
460 Crown Point.....2¾@2.60
500 Con Imperial.....45c
140 Chollar.....5¾@6
140 Con Virginia.....3.35@3.40
80 Caledonia.....1.05@1
300 Exchequer.....2.85
110 Gould & Curry.....5¾@4.90
240 Hale & Nor.....6@5¾
200 Justice.....1.65
30 Mexican.....13¾@14
200 New York.....30c@27c
150 Ophir.....17¼@17½
50 Overman.....1.60
145 Yellow Jacket.....8¼@7¾

AFTERNOON SESSION.

760 Addenda.....90@85c
530 Argenta.....60c
440 Albion.....85@60c
340 Black Hawk.....85c@75c
250 Belvidere.....3@2.90
420 Bulwer.....7¾@7¾
200 Bodie.....10¾@10¼
550 Belding.....75@65c
290 Belmont.....15c
450 Boston.....1¼@1.20
120 Belle Isle.....1.10@1.05
620 Booker.....50@55c
675 Concordia.....1¼@1.15
1150 Champion.....1.15@1.10
500 D Standard.....85c@90c
510 Day.....75@80c
125 Dudley.....70c
30 E M Diablo.....1.10
100 Endowment.....10c
1145 Gould & Con.....19¾@19¼
950 Goodshaw.....45c@40c
690 Grand Prize.....1.15@1.10
150 Holmes.....1¼
300 Hillside.....80c
100 Independence.....1
525 Jupiter.....2.05@1.95
50 Jackson.....3¼@3¼
100 K K Con.....3¼
10 Mono.....7@7¼
320 Mammoth.....2.55@2¾
660 May Belle.....30@25c
10 Mt Diablo.....2¼
350 McClinton.....85@80c
90 Mt Potosi.....1.65@1¾
100 Metallic.....2¼
120 Manhattan.....1
50 Northern Belle.....17
749 N Belle Is.....25c
420 N Noonday.....4
1300 Navajo.....30c
340 Noonday.....4.10@4
450 Orient.....5c
100 Oro.....4¼@4¼
620 Paradise.....60c
250 Queen Bee.....40@35c
300 Red Cloud.....40c
785 Raymond & E....60@65c
250 Real del Monte....1.15@1
1050 S Bulwer.....90@75c
470 Silver King.....5¾@5
640 Summit.....1.20@1.10
70 Syndicate.....1.40
30 S Bodie.....60c
100 South Standard.....20c
20 Tioga Con.....2¾

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business.
Addenda G & S M Co	California	3	20	Mar 25	Apr 30	May 21	T H Dixon	328 Montgomery st
Andes S M Co	Nevada	14	25	Feb 26	Apr 1	Apr 20	B Burris	309 Montgomery st
Belmont M Co	Nevada	23	20	Mar 3	Apr 8	May 5	J W Few	310 Pine st
Belvidere M Co	California	6	50	Mar 4	Apr 6	May 1	C V D Hubbard	203 Bush st
Bodie Tunnel & M Co	California	4	20	Feb 3	Mar 21	Apr 28	A F Main	309 California st
Bullion M Cn	Nevada	14	1 00	Mar 25	Apr 28	May 18	J M Brazill	Safe Deposit build'g
Champion M Co	California	6	50	Feb 28	Apr 5	Apr 27	J Crockett	203 Bush st
Commonwealth Con M Co	California	2	10	Mar 24	Apr 26	May 13	C A Morse	217 Sansome st
Con Pacific M Co	California	1	1 00	Mar 13	Apr 16	May 8	F E Luty	330 Pine st
Day S M Co	Nevada	5	05	Mar 2	Apr 6	May 3	J F Few	310 Pine st
Dudley M Co	California	7	25	Feb 4	Mar 8	Apr 5	E C Masten	309 Montgomery st
Endowment M Co	Nevada	4	25	Mar 1	Apr 5	Apr 26	E M Hall	327 Pine st
Equitable M & M Co	Utah	22	10	Mar 22	Apr 30	May 25	C J Collins	227 Montgomery st
Hillside M & M Co	Nevada	2	30	Feb 4	Mar 8	Apr 5	F Frankenthal	330 Pine st
Indian Queen M Co	Nevada	3	15	Feb 11	Apr 19	May 10	G Adams	431 California st
Julia Con M Cn	Nevada	11	50	Mar 3	Apr 7	Apr 26	H A Charles	419 California st
Justice M Co	Nevada	31	50	Feb 9	Mar 15	Apr 5	A E Kelly	419 California st
Leviathan M Cn	Nevada	10	25	Feb 17	Mar 20	Apr 10	F A Frisius	330 Pine st
Mammoth M Co	California	4	1 00	Feb 18	Apr 24	May 21	A Wilkee	302 Montgomery st
Martin White M Co	Nevada	6	50	Mar 22	Apr 28	May 20	J J Scoville	309 Montgomery st
McClinton M Co	California	6	25	Feb 6	Mar 12	Apr 2	W H Lent	309 Montgomery st
Metallic M Co	——	2	25	Feb 9	Mar 15	Apr 5	——	309 Montgomery st
Modoc Con M Co	——	9	1 50	Mar 18	Apr 26	May 17	J W Few	310 Pine st
Mono C M Co	California	7	1 00	Mar 9	Apr 13	May 4	W H Lent	309 Montgomery st
Monte Christo Con M Co	California	3	10	Mar 19	May 8	June 3	B Burris	309 Montgomery st
Navajo M Co	Nevada	6	10	Mar 22	Apr 23	May 14	E M Hall	327 Pine st
North Bonanza M Co	Nevada	5	25	Mar 20	Apr 24	May 18	W W Stetson	309 Montgomery st
Occidental M Co	Nevada	6	50	Mar 9	Apr 12	May 3	A K Durbrow	309 Montgomery st
Oriental Con G & S M Co	California	6	50	Mar 3	Apr 3	Apr 17	H C Hinman	411 California st
Real Del Monte M Co	Nevada	10	50	Mar 4	Apr 10	May 8	C V D Hubbard	203 Bush st
Savage M Co	Nevada	41	50	Feb 4	Mar 8	Mar 27	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	62	2 00	Mar 8	Apr 10	Apr 28	E L Parker	309 Montgomery st
Tellurium G & S M Co	California	21	10	Feb 24	Mar 26	Apr 20	J M Litchfield	420 California st
Tioga Con M Co	California	9	20	Mar 22	Apr 26	May 17	W H Lent	309 Montgomery st
Utah S M Co	Nevada	23	2 00	Mar 3	Apr 6	Apr 26	G C Pratt	309 Montgomery st
Yellow Jacket S M Co	Nevada	36	1 00	Feb 14	Mar 29	Apr 28	M Otey	203 Bush st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona P & M Co	Arizona	1	05	Feb 13	Apr 5	Apr 27	C E Travers	331 Montgomery st
Atlanta M Co	Utah	1	05	Dec 23	Apr 9	May 5	A F McGrew	420 Montgomery st
Arizona Concentration Co	Arizona	1	10	Feb 9	Mar 17	Apr 5	C E Travers	402 Montgomery st
Blackhawk G M Co	California	8	25	Mar 17	Apr 21	May 13	H A Charles	419 California st
Butte Hydraulic M Co	California	2	10 00	Feb 20	Mar 30	Apr 19	L L Dennery	729 Montgomery st
Equator M Co	Nevada	2	45	Feb 18	Mar 22	Apr 12	W Willis	309 Montgomery st
Esta Buena Con S M Co	California	6	20	Feb 21	Apr 19	May 4	R N Brooks	509 Sacramento st
Florida Hill M Co	Idaho	2	10	Feb 25	Apr 7	May 4	R Wecener	414 California st
Gover M & M Co	California	41	10	Mar 8	Apr 12	May 3	W O Wilson	402 Front st
Headlight M Co	California	2	10	Mar 20	Apr 10	May 14	A W Rose	302 Montgomery st
Idaho G & S M Co	California	1	10	Mar 25	Mar 26	May 12	C Meade	324 Pine st
Iowa M Co	Nevada	4	25	Mar 1	Apr 6	Apr 26	E M Hall	327 Pine st
Jackson M Co	Nevada	11	1 00	Feb 10	Mar 16	Apr 5	C N Shaw	408 California st
Last Chance M Co	California	1	05	Feb 28	Apr 10	May 3	G W Fisher	324 Pine st
Maryland Con G & S M Co	California	1	25	Mar 17	Apr 20	May 8	E P Farnsworth	202 Sansome st
Mineral Fork M & S Co	Utah	2	08	Feb 21	Apr 3	Apr 24	S Purdy	331 Montgomery st
Oro M Co	California	4	25	Feb 18	Mar 26	Apr 21	——	302 Montgomery st
Queen Bee M Co	California	6	10	Mar 13	Apr 19	May 10	G W Fisher	324 Pine st
Silver Hill T & M Co	California	1	05	Mar 3	Apr 6	May 6	J B Mackie	309 California st
University G M Co	California	5	10	Feb 10	Mar 26	Apr 15	W L Oliver	328 Montgomery st
Western M Co	Arizona	2	1 00	Jan 20	Mar 4	Mar 30	C S Curtis	203 Bush st
Wide Awake P & M Co	Arizona	9	03	Feb 11	Mar 15	Apr 3	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Brilliant M Co	——	J M Buffington	309 California st	Annual	Apr 21
Bulwer Con M Co	California	W Willis	309 Montgomery st	Annual	Apr 14
Carrie Belcher M Co	California	O Miller	324 Pine st	Special	Apr 12
Champion M Co	California	G O Hurlbut	525 Commercial st	——	Apr 13
Concordia M Co	California	W J Taylor	310 Pine st	Special	Apr 12
Iron Cap M Co	Arizona	O Meade	324 Pine st	Annual	Apr 28
Oregon Con G & S M Co	Nevada	D Wilder	328 Montgomery st	Annual	Apr 13
San Carlos Coal M Co	——	A J Kopsen	230 Montgomery st	Annual	May 24
Silver King South M Co	——	A Judson	220 Sansome st	Special	May 8
Tioga Con M Co	California	W H Lent	309 Montgomery st	Annual	Apr 12

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	E M Hall	327 Pine st	20	Feb 28
Black Bear Q M Co	California	W L Oliver	Safe Deposit Bldg	25	Mar 15
Bodie Con M Co	California	W H Lent	Nevada Block	25	Mar 1
California M Co	California	O P Gordon	Nevada Block	50	Dec 22
Cherokee Flat Blue Gray M Co	Cal	R N Van Brunt	316 Pine st	4 25	Mar 13
Con Virginia M Co	Nevada	W Havens	Nevada Block	50	Dec 23
Eureka Con M Co	Nevada	P Jacobus	37 Nevada Block	30	Mar 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	30	Mar 24
Great Western Q M Co	California	A Halsey	312 Montgomery st	25	Feb 3
Natoma Water & M Co	California	——	——	2 00	Apr 5
New York Hill G M Co	——	J B Leighton	627 Clay st	25	Feb 20
Ophir S M Co	Nevada	D L McCoy	203 Bush st	1 00	Jan 20
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Mar 12

Pacific Board—Latest Sales.

Wed'sday A.M., Mar. 31.

100 Alta.....3¼@3.55
170 Andes.....75c@65c
320 Alhion.....1¼@1.40
1200 Atlas.....6c
50 Benton.....2¼
100 Belcher.....4.30
155 Bullion.....3.80
10 Best & Belcher.....9¾@10
200 Booker.....55c
200 California.....3
210 Con Virginia.....3¼
400 Crown Point.....3@2.90
10 Chollar.....5¾
400 Champion.....1.20
100 Day.....85c
50 Exchequer.....2.90
100 Eureka Con.....19¾
120 Gould & Curry.....5
30 Hale & Nor.....5¾
210 Justice.....1.65@1¾
10 Mono.....7¾
160 Mexican.....13¾
160 Ophir.....17¼@17½
100 Scorpion.....3.05@3
60 S Nevada.....20¼@20¾
230 Savage.....6
100 Silver Hill.....75c
110 Union Con.....37@36¾
300 Uncle Sam.....20c
30 Yellow Jacket.....8¼

AFTERNOON SESSION.

50 Andes.....70c
100 Albion.....1.10
120 Bullion.....3¾@3.70
110 Best & Belcher.....10
100 Bodie.....11@11
100 Benton.....2.55
20 Belcher.....4¼@4.20
140 Con Virginia.....3.10
620 Con Imperial.....50@45c
70 Crown Point.....2.85
10 Day.....80c
75 Eureka Con.....19¾@19¼
50 Gould & Curry.....5¼
100 Hale & Nor.....6.20
20 Julia.....1.05
185 Mexican.....14@14¼
50 Mono.....7¾
60 Ophir.....17½
30 Overman.....1.95
50 Silver Hill.....70c
100 Scorpion.....3
250 S Bulwer.....85c
10 Utah.....9¾
165 Yellow Jacket.....8¼
100 Justice.....1.65
100 Lady Wash.....65c
10 Mexican.....13¾
10 Overman.....2
20 Ophir.....17¼@17½
10 Sierra Nevada.....20¾
50 S Bodie.....60c
25 Silver Hill.....65c
20 Union Con.....37
10 Utah.....9¾
600 Wells-Fargo.....3c
25 Ward.....1¼

undoubtedly does, answer the purposes of speculators to have this condition continued; but it does not aid in the development of the mining properties, nor in the advancement of the mining interests. It in reality has a diametrically opposite effect, and produces in the stock hoards the dullness and inertia that are now and have been so long prominent. Every day there is some little flurry, a mere ripple upon the surface of the stock pool, but ere the closing of the day's operations a lethargetic stagnation supervenes which no efforts can overcome.

Rumors and reports of bonanza discoveries and rich strikes are sent down from the mines, which, had they reached

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

ITEMS.—*Ledger*, Mar. 27: George Thomas, of Jackson Gate, has taken a contract to sink 100 ft on the Doty claim, in Hunt's gulch. Work is in progress on the contract. Jos Simsich has contracted to sink the new shaft on the Zelle mine an additional 200 ft. He has commenced the contract. D. McKay and John Eagan bonded a mining claim near the Moore mine to McLaughlin, who has started to open it up. Owen Kelly has bonded a quartz claim in Hunt's gulch for $12,000.

YELLOW JACKET.—The shaft is down 90 ft, with good ore on the bottom. Water is somewhat troublesome. The company has secured the Bonanza mill, but are unable to crush as yet, there being no water supply. Negotiations are progressing for the purchase of the pipe carrying water from the Crown Point mill, and if successful it will soon get to its work of testing the gold-bearing qualities of the quartz.

CALAVERAS.

BOSTON.—*Advertiser*, Mar. 25: Work is progressing rapidly, and in a short time the necessary machinery will be placed in position, which consists of an 80-stamp mill and 8 furnaces, by which the precious metal will be extracted. This lode is 30 ft in width; the ore is rich, bearing gold and silver.

CALAVERAS MINES.—*Chronicle*, Mar. 27: At the Eureka diggings is still the order of the day, it being impossible to pipe the bottom until water can be brought in through the Rich Gulch ditch. As the Rich Gulch conduit is dependent upon Clark's canal for water and the latter is still frozen up at the head, there is no knowing when a supply of the aqueous can be had from that quarter. Veith, of the Mammoth, has not yet finished cleaning up. It will be several figures to express the amount yielded when concludes. At the Penobscot, Emerson & Co. proprietors, piping is steadily indulged in, and at the same time a hand-power derrick is being erected. When completed a derrick will facilitate the removal of boulders and other obstructions. The Penobscot is blossoming out into a full-fledged hydraulic. At the Duryea piping has been resumed after a temporary suspension to permit of changing the direction of the discharge from the mine.

TUOLUMNE.

HOPLAND ITEM.—Ukiah *Press*: The gold is found in the same kind of location as at Capella—a detached ridge about a mile long. With flat sluices and a small head of water, 5 men cleaned up $4 per day each, or $20 for the whole per diem, for several days' run. One man cooked and tended water, 1 tended sluices and 3 picked and shoveled dirt into the sluices. Gold is found in places all the way to the Gualala. The boulders are all worn and water-washed, and at some far distant date a great river must have brought the gold down from the north.

SONORA.

BELVIDERE.—*Free Press*, Mar. 23: From top of upraise to south drift is in 85 ft, being 138 ft south of main shaft. The north drift on the 350 level is in 42 ft from the shaft, the face showing some 2 or 3 ft of ore of excellent quality. At the 300 level the new north drift is in 41 ft from the shaft. Some good ore is already making its appearance.

STANDARD CON.—The east crosscut, 500 level, is in from the shaft 200 ft. East crosscut from the south drift, 385 level, to connect with the north drift on the West Standard vein, is in 22 ft. Upraise No. 2 from this south drift is up 92 ft, showing a ledge 6 ft wide, of very rich ore. Upraise from the north drift is up 105 ft, with a vein in the top 4½ ft wide, of good milling ore. North drift on the 400 level, 300 level, incline, is in 221 ft; the ledge is 3 ft wide, of good ore. South drift from the west crosscut is in 241 ft; the ledge is 2½ ft wide. North drift, 550 level, is in 120 ft; the ledge in the face is 4 ft, of good milling ore.

JUPITER.—The 500 level, west crosscut from the main south drift, is in 173 ft. The west crosscut from south drift No. 2 is in 104 ft.

WOODSHAW.—The winze on vein No. 2, 450 level, is now down 135 ft. There are 4 ft of ledge matter and 2 ft of solid rock now in the bottom. The ledge improves in strength and quality as depth is attained. A circumstance of peculiar significance on the 450 level and in the winze is that veins Nos. 2 and 3 are only 10 ft apart, and are gradually coming together, and every indication the winze goes to show that these two ledges must come in contact and unite very soon.

BOSTON CON.—The main incline shaft has reached a depth of 64 ft below the 200 level. The north drift, 200 level, has been extended 14 ft during the week. The face of this drift is now in a large vein, mostly quartz, with improved appearance.

SOUTH NOONDAY.—Drifts north and south are now being run on the Cummins ledge, which was cut in the east crosscut on the 150 level. The north drift is in 40 ft, showing a well-defined ledge of good ore. In the face the ledge takes up the entire width of the drift, and the ore is of a better quality than any yet encountered. The south drift is in 28 ft, and the ore is of good milling quality. As the drifts are advanced, 4 tons of ore are raised daily and piled on the dump. There are 60 tons ready for shipment after milling purposes.

HOMER.—The tunnel is in 170 ft. A branch drift has been started on the Seneca vein, 154 ft from the mouth of the tunnel, running southwest toward the Nioma vein, and the face in the vein is fully 3 ft in thickness, of high-grade ore.

BODIE TUNNEL.—During the past week a ledge of good milling ore has been cut, 4 ft wide. The winze at the 60-ft station is down 18 ft, showing a strong, well-defined ledge, assaye averaging $30 in gold.

BELWER CON.—The north drift on the Ralston vein is in 25 ft; the ledge in the face is 3 ft wide. The south drift in from the tunnel 110 ft. The ledge is 2 ft wide, and looking well. The Stonewall ledge is 2 ft wide, of rich ore, and in the stopes on the Ralston vein the ledge is 4 ft wide, of good milling ore.

STANDARD.—The north drift, 530 level, is in 102 ft. The ledge is 2½ ft wide. The south drift is in 179 ft; the ledge is 3 ft wide. The upraise to connect with the east crosscut from the 450 level of the Standard mine is up 76 ft; the ledge is 3 ft wide.

DOUBLE STANDARD.—The north drift is in 20 ft. The ledge in the face is 3½ ft wide, of good ore. The winze is down 13 ft; the ledge in the bottom is 8 ft wide, and looks well.

TIOGA.—*Chronicle*, Mar. 2: Since last report the station at the 800 level has been completed, receiving tank put in place and shaft sunk and timbered 14 ft below station. Crosscutting from the 800 level, both east and west, was commenced. The east crosscut now in 9 ft, and the west 3 ft.

UNIVERSITY.—*News*, Mar. 20: The shaft is down 450 ft. During the past week an entire change of formation has come in, being of a gray porphyry with seams of bright, lively quartz, giving fair assays, continually coming in.

KING BEE.—The shaft is down 132 ft. The ground continues of the most favorable character.

NEVADA.

A NEW QUARTZ FIELD.—*Transcript*, Mar. 21: The recent quartz discoveries 5 miles north of this city, are regarded as among the richest and most important ever made in this part of the State. On the 15th of last January, W. W. Kirkham and Wm. Hitchcock located a claim a quarter of a mile from the Mt. Vernon house, where they had discovered some fair looking croppings, and now have an incline down 50 ft. In the top is a ledge of 20 inches that will pay $200 per ton, while numerous bunches found in it yield $5 a pound. The ledge in the bottom of the incline is 4 inches thick and pays from $7 to $10 a pound. The ore is all decomposed, but the walls are well defined. An arastra is run on the low-grade ore, while the picked is pounded in a hand mortar. In four days by these rude means the owners have taken out $1,500. The ledges increase in size and richness with depth. They have another ledge one-quarter of a mile southeast of the above on which they have sunk 40 ft. It is from 6 to 8 inches thick, and pays $80 per ton.

GREEN MOUNTAIN.—This mine is situated a quarter of a mile above the Murchie, near Deer creek. The surface has been worked by tunnels. A 30-ft shaft was sunk from one tunnel when the water drove the miners out. They left a 2½-ft ledge in the bottom that was paying $24 a ton. The claim has produced $7,000 or $8,000. The ore near the surface paid $17 to $24.

J. C. MURCHIE, ET AL., GRAVEL.—This property, situated 2½ miles from this city, on the Dutch Flat road, consists of 100 acres patented ground on the blue gravel lead, and 80 acres more unpatented. There are three ditches, three reservoirs, pipe, etc. The main bank has a hight of 60 ft and is 800 ft in width. There is a strata of blue gravel from the bedrock up, about 20 ft, which prospects splendidly. The claim has paid from $100 to $300 per day to the man with shovels, in early days. There are the extensions of several rich quartz lodes running through this property. There is a tunnel run on the "Never-give-it-up" quartz lode, 500 ft. The quartz has paid $8 per ton. An upraise has been made from the back end of this tunnel, tapping the blue gravel near the rimrock, which prospects splendid in fine gold.

NORTH STAR.—The ledge varies from 18 to 36 inches in thickness, is sulphureted, and paye an average of $14 per ton.

EUREKA.—This mine was partially worked to water level several years ago by Prof. Muller and others, the ore paying about $100 a ton, the ledge averaging 12 inches. The present tunnel is in 250 ft and will reach the chute within 100 ft more.

MYERS RAVINE.—One party has taken out $3,000 from a ledge he found there a short time ago, and two of the oldest gravel miners in the county are about to quit their present claims and begin work on a ledge in the same locality.

GENTLE ANNIE.—There are two tunnels and an incline, the last named running along a 5-ft ledge of good ore, and also developing a gravel deposit that prospects well.

SNEATH & CLAY.—This claim is located on Gold flat. The first crushing in 1862 paid $32 a ton. The second crushing a few months after yielded $80. Some of the ore paid $186 per ton. Hoisting works and mill were erected. When the mill was completed in 1863, there were from 800 to 1,000 tons of ore on the dump, which averaged $70 a ton. The incline was down 150 ft, with several drifts, and the bonanza chute was lost. The mine yielded over $200,000, over one-half profit, and was sold to parties who worked it for two years profitably, the rock varying from $20 to $50 to the ton. After several years work and taking out over $200,000 more, the mine was shut down.

BULLION.—This mine is situated on Wolf creek, 2½ miles south of the city. A north and south ledge, two ft thick and uniform, shows in the tunnel for a distance of 150 ft. Assays prove the ore to contain from $20 to $40 per ton in gold and silver.

COLUMBIA.—This property is located on Gold flat, about a mile south of the city. Prof. Muller worked a 10-inch ledge on this claim in 1858, and realized $20 a ton from the ore, which is rich in sulphurets.

EAST ORLEANS.—The tunnel is 727 ft long, 400 ft being between the walls. The formation is from 4 to 8 ft thick, the ore yielding from $11 to $15.50 per ton. It has been worked to water level. The present owners in running the tunnel have cut through the apex of two pay chutes, which they originally started to tap, being yet 80 ft ahead of the face of the tunnel.

YELLOW DIAMOND.—A strong ledge lying between slate and granite has been worked by two tunnels for a depth of 50 ft. The ledge carries 4% of sulphurets, mixed samples of which assayed $3,600 a ton. They have run a tunnel 100 ft and cut the ledge 75 ft below the surface, and are drifting and obtaining some very rich ore.

ILLINOIS.—The Illinois claim consists of 2,000 linear ft on the ledge. Two shafts were sunk, one 50 and the other 30 ft. The ledge was struck in both shafts and showed an average width of 2 ft.

BUCKEYE.—The ledge is a contact, from 4 to 6 ft thick. The incline is down 220 ft, and the tunnel 300 ft in length. The ore produced from $12 to $24 per ton.

ROUND MOUNTAIN.—This mine is located 4 miles north of the city and comprises 160 acres. From the west side of the claim extends a 700-ft tunnel with 800 ft of drifts. The channel averages 6 to 8 ft in hight and 100 ft across, and runs clear through the property. The gravel pays from $2 to $3 a car.

CALEDONIA CON.—Embraces the Holmes, Baker & Ashburn and other properties, including 4½ miles of ditch, reservoirs and piping. It is on the same north and south range of gravel as Blue Tent, Quaker Hill and Little York, while it has the very great advantage of being also intersected by the channel which runs east and west.

BUCLOW CON.—The shaft is down 200 ft. There is a tunnel running along the ledge which is 5 ft thick. This tunnel when completed will give 500 ft of backs. The croppings of this claim paid 0.25 a ton; below 20 ft, $18.93; below 175 ft, over $50.

PLACER.

QUARTZ ITEMS.—*Herald*, Mar. 27: Stuart, Thatcher & Low sold last week the Umatilla and Red Cloud, of 1,000 ft each, to a New York company for $2,000. They are 3 miles from Auburn. One shaft is down 52 ft; the ledge is 3½ ft thick, and the ore is worth $25 per ton. The 5-stamp mill, located on one of the claims sold, is retained by the original owners.

SAN BERNARDINO.

IVANPAH CON.—*Times*, Mar. 20: From Mr. J. B. Cook we learn that there is a large force of men at work on their mines. The mill has commenced running. Mr. Cook showed us a specimen of the ore, which is among the finest we ever saw from the district. Forty tons are on the dumps and at the mill. The mill is one of the finest in the State, and there will be a large shipment of bullion about April 1st.

ULEY.—Is turning out better ore than ever, having struck very rich ore. The mine shows that the more work that is done the more ore of a high grade can be obtained.

BULLION.—Struck it very rich, and has now shown its permanency and will become one of the regular paying mines of the district.

CAMBRIA.—This mine is situated 0 milee south from Ivanpah, and is turning out considerable quantitiee of ore of a good paying quality, and will add another permanent mine to the district.

GOLD MINES.—The discovery of gold in this camp was a surprise to a great many. Mr. Cook informs us that Mr. L. M. Wilson, who accompanies him, has some very fine ledges, the gold showing in quantities. Mr. Wilson has had some tons of ore crushed and is about putting up some arastras to amalgamate. The pulp shows that the rock goes from $40 to $100 per ton. Mr. A. McFarland has also a fine ledge of gold rock in the same vicinity, which will no doubt turn out equally well. Altogether, Ivanpah has never had a brighter future.

SHASTA.

GREAT EASTERN.—*Independent*, Mar. 25: The ledge is 4 ft in width and assays, by the mortar, from $10 to $60 per ton, taken from all parts of the ledge. It continues a distance of upwards of 400 ft. A shaft has been sunk 40 ft, which shows an improvement in the richness of the ore every foot of the way.

TUOLUMNE.

RAWHIDE.—*Independent*, March 27: The shaft is down 320 ft, at which depth the vein is 25 ft thick. There is a 20 stamp mill, on the most improved plan of any mill ever before built in the county, and together with machinery for hoisting and pumping. It is not being worked. The ore is of a fair milling quality.

CHAPARRAL.—A level has been driven in on the vein 75 ft, and shaft sunk from the level 90 ft, which makes the entire depth 120 ft. A shaft is being sunk on the hillside to connect with the works below which will serve to ventilate the mine, also as a working shaft. There is a 6-ft vein on the bottom of the shaft with a 4-inch gouge of black clay. The entire width of this vein shows free gold; the sulphurets carry a large percentage.

CONFIDENCE.—In the 1000 level plenty of ore stands ready to be taken out. In the raise, filled with loose quartz, men are at work on a 3-ft vein that shows gold freely. The whole mine is pierced with large veins running in every direction, much of it low grade ore. There are 500 tons of ore that will pay from $15 to $20 per ton in the mill.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—Gold Hill *News*, Mar. 31: On the 2300 level, and from a point 600 ft north of the east shaft, a crosscut has been started west. This will be pushed till the west wall of the vein is found, when the angle of its dip will be ascertained and a raise made to the main shaft of the mine. Opposite this west crosscut another has been started east to prospect the ore vein lying in that direction. The winze from the 2400 level and 145 ft north of the incline, is in good ore, the bottom 88 ft below that level. Above the 2300 level, and back of the incline, stopes have been opened, which are yielding 25 tons per day of good milling ore.

ORIDE.—Winze No. 2 from the 2100 level is 32 ft below that level and continues in good milling ore. The raise from the south drift on the Hardy vein, on the 2200 level, has connected with the winze, and the connection has improved ventilation. The north drift, 2200 level, is in vein porphyry and 225 ft from the main southeast drift. The joint Mexican crosscut east on the 2300 level continues in favorable-looking vein material carrying low-grade quartz; total length, 250 ft. Crosscut No. 1 from the Hardy vein east is in 110 ft from the north drift, and is getting some fair-grade ore. The main north drift on the 2500 level is in a heavy vein formation carrying low-grade quartz; total distance from incline, 314 ft. The east drift on this level is in from the incline 250 ft.

BELCHER.—A diamond drill has been run in crosscut No. 2 east on the 3000 level, and has tapped the water, which is being allowed to drain off. This water is the hottest yet encountered on the Comstock, being 170° Fahr.

LEVIATHAN.—The 750 level is in 100 ft. The face is still in vein matter of a very promising character, streaks of which give assays of $10 or $15 per ton. The north crosscut is in 38 ft.

CROWN POINT.—The winze from the 2700 level has reached a depth of 278 ft on the slope below that level. In the crosscut east on the Belcher line a diamond drill was run in about 100 ft, and encountered rock giving assays of $5.

YELLOW JACKET.—Sinking in the shaft has been resumed, a diamond drill having been sent ahead and not enough water having been encountered to hinder operations. Total depth of shaft, 2,870 ft—the deepest perpendicular workings on the lode. West crosscut, 2700 level, is in 250 ft.

CALIFORNIA.—The crosscut west, 1,500 level, is in 105 ft. The raise for the north ore vein is in low-grade quartz 35 ft above the 2100 level.

CON. VIRGINIA.—The joint California east crosscut, on the 2200 level is now 214 ft in length and in a fine vein formation carrying streaks of clay and quartz. Daily ore yield, 150 tons.

CON. IMPERIAL.—The north drift on the 2800 level is in hard porphyry; total length, 260 ft. The joint Alpha winze from the 2000 level has a depth of 280 ft on the slope and is near the 2800 level. It is in quartz and porphyry.

GOULD & CURRY.—The G. & C. and B. & B. shaft has attained a depth of 994 ft. The raise from the 1700 level to meet this shaft is up 310 ft, leaving 116 ft yet to be made to connect the two.

SAVAGE.—The main incline is down on the slope below the 2200 station 250 ft. The drift for this incline from the 2400 station of the C. N. S. shaft is in 535 ft.

MEXICAN.—The crosscut east on the 2300 level, joint with Union Con., is 270 ft in length, and has 35 ft yet to run to reach the point from which the joint winze will be sunk to the 2500 level.

BELMONT DISTRICT.

BARCELONA.—*Courier*, Mar. 20: Four or five tons of high-grade ore have been extracted from the new strike in the old works, which improves in width and richness. We average 1 ton per day of first-class ore, which assays $380.15 per ton; also 4 tons of second-class ore which assays $94.25; besides which we have 1,000 tons of low-grade ore on the dump which assays from $31.42 to $62.33 per ton. We have started up the compressors and cleared the Joint tunnel of foul air, and have cut through veins which assay well.

SAN ANTONIO.—Have opened a station in the ledge at the junction of the crosscut, and run the main 450 level south 12 ft along the hanging wall. Are running this level a short distance north to put up a raise to the 350 level to give an air course, as well as an escape in case of any accident in the main incline. The ledge averages 8 ft in thickness, and the assays run over $15 per ton. It improves as it goes south towards the ore chimney.

JETT CON.—In the last 6 days have sunk the Centennial shaft 10 ft, making the total depth 90 ft. The Idlewild tunnel level is in 116 ft.

BRISTOL DISTRICT.

ITEMS.—Piocho *Record*, Mar. 27: The mining outlook of Bristol district never looked so bright as it does at present. Two companies are now operating there—the Hillside mill and mining company, of San Francisco, and the Bristol silver mining company, of Minneapolis, Minn., who have taken hold of several properties in the district, including the Cave and Mayflower, and have purchased hoisting works; are putting up a 10-stamp mill and have an improved arteeian well apparatus, capable of sinking to a depth of 3,000 ft, and intend boring for flowing water in a few days. They have machinery and sections for a water-jacket furnace. The Hillside is the oldest company and have been operating in Bristol for 2 years. They have recently made several improvements, putting up new hoisting works on the mine, building a refinery and have torn down their stone smelter, and have in process of erection a 55-ton water-jacket furnace. A great deal of work has been done on their mines, the Hilleide and the Mondha.

EUREKA DISTRICT.

DUNGERBERG.—*Sentinel*, Mar. 25: We made mention some time ago that a bonanza had been found in this property. It has been worked ever since with gratifying results. The top, bottom and sides of the drift are still in good ore. The ore was found on the 400 level, and prospecting is now being done on the 3d and 5th levels to find the extent of the ore body. From 15 to 18 tons are daily extracted and sent to the Richmond works for reduction.

RUBY CON.—The crosscut toward the Home Ticket has been advanced during the week 20 ft. The ground is more favorable for progress. Good ore continues to be extracted from the sinking in the Home Ticket. The returns of ore now being made are all the result of exploring, and are going far towards meeting the costs of the mine.

RICHMOND.—No. 11 chamber is looking very well in the southwestern end, and promisee to yield a large quantity of ore. The No. 12 chamber is not looking so well as it was. No. 10 is looking better. No. 15 chamber is looking well, and has improved since last report.

HOOSAC.—The west drift on the 200 level is in 720 ft, in very favorable ledge matter. During the last 370 ft, the drift has been run through a mixture of decomposed quartz, porphyry, solidified lime and clay, with occasional bunches of black quartz, indicating a close proximity to a body of ore. In the years 1873 and 1874 this mine produced over $700,000.

EUREKA CON.—The following work has been done in the several different levels: 2d—North drift continued 22 ft, now in 113 ft; 3d—Winze sunk 22 ft, now down 32 ft; 7th—North drift continued 17 ft, now in 221 ft; northeast drift continued 14 ft; now in 233 ft; 8th—Southeast drift continued 35 ft; now in 200 ft; 9th—South drift continued 51 ft, now in 68 ft; west drift continued 11 ft, now in 48 ft; upraise continued 17 ft, now up 17 ft; 10—East drift continued 42 ft, now in 233 ft; 11th—North drift continued 17 ft, now in 154 ft.

ESMERALDA DISTRICT.

THANKSGIVING.—*Herald*, Mar. 27: This mine is located on Last Chance hill. Assays have been made which show up in the hundreds, though we put the average of the whole 54 ft at $100. It shows a ledge of white quartz on the surface 13 ft thick, with ore running as high as $187 per ton. At the depth of 100 ft a ledge 54 ft has been run through, there not being 1 foot in the whole space that will not pay for crushing. The first 20 inches of the ledge will assay over $100. After passing through this seam, about 6 or 8 ft of clay and porphyry is encountered, then another seam of clay about 3 ft thick, carrying rock that will horn out from 75 to 100 colors of gold to 1 ounce of rock. There is some other rock among this clay in which the gold is coarser, but it is not as rich as that carrying the finest gold. Adjoining this seam of clay is 10 ft of solid white quartz, which will horn out a great many colors to an ounce of rock. The whole 10 ft will mill $30 or $40 per ton. Next is about 1 foot of porphyry and clay, then 10 ft of black and rose-colored quartz, the black carrying iron and silver, the rose-color gold. Next is a few ft of white quartz, clay and porphyry, then 10 ft of black and rose-colored quartz, carrying more gold and silver than the first 10 ft of the same kind passed through.

MOUNT ROSE DISTRICT.

PARADISE AND BULLION.—*Reporter*, Mar. 27: These 2 mines have been for more than a year advantageously worked, at a depth of 500 ft from the surface, by a tunnel extending 600 ft into the hill, and continually showing rich ore. The profitable working of both the above-mentioned mines, coupled with the recent discovery of a strong ledge, also rich in mineral, immediately north of the Bullion line (said discovery being known as the North Bullion), and the strike of a large body of rich ore in the Mayflower claim, is "confirmation strong" of the existence of untold wealth yet undiscovered. The Paradise mill commenced running exclusively by water power on the 26th, and everything works satisfactorily.

ITEMS.—The Mount Rose, conducted under the same management as the Paradise, daily gives evidence of its wealth and permanency. A shaft will shortly be sunk on the Mary Wilder to ascertain the quantity of mineral in that claim, the Salt Lake returns having settled the question of its quality.

ARIZONA.

TOMBSTONE ITEMS.—*Nugget*, Mar. 25: On the 22d the Contention mill made their first shipment of 5 bars of bullion, varying from 900 to 940 fine, and worth from $2,500 to $3,000 per bar. On the 23d they made a second of 5 bars more, worth about the same as the first. On and after this date they will ship 10 bars per day. The Corbin mill will erect 5 more stamps, making in all 20 stampe, the same number that the Contention mill runs; and with the Gird mill's 10 stamps, and the Corbin's 20, all pounding on Tough Nut ore, we may expect to see from $60,000 to $75,000 per week leaving Tombstone district, and with the Contention bullion, we may safely count on shipping $100,000 per week.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

WINDSOR M. CO.—Mar. 23d. Location: Columbus, Nevada. Capital, $10,000,000. Directors—T. L. Stanley, O. W. Randolph, Horace Webster, John Spruance and W. E. Norwood.

STEPHENS CONCENTRATOR CO.—Mar. 24th. Object: To manufacture and sell the Stephens dry ore concentrator. Capital, $100,000. Directors—W. S. Rosecrans, E. W. Stephens, C. M. Seeley, Charles E. Travers, R. C. Ames, S. E. Olmstod and W. N. Stevens.

RED JACKET G. & S. M. CO.—Mar. 24th. Capital, $1,000,000. Directors—J. M. Tosh, P. G. Vibbard, C. H. Wakelee, G. W. Spencer and S. C. Curtis.

DWELLE M. CO.—Mar. 21st. Location: Esmeralda county, Nevada. Capital, $10,000,000. Directors—R. N. Graves, A. Hayward, W. H. Sheridan, William Kohl and J. Epstein.

CASTLE DOME SMELTING & M. CO.—Location: Arizona. Capital, $1,000,000. Trustees—John M. Wells, Henry K. Southwick, John W. King, William Bond, James C. Hayes, Geo. A. Miner and Andrew H. Carghill.

CISCO G. M. CO.—Mar. 23d. Location: Placer county, Cal. Capital, $5,000,000. Directors—P. S. Van Rensselaer, E. M. Walkor, W. L. Oliver, Charles G. Fink and Charles Kaufman.

WAGE M. CO.—Mar. 23d. Location: Fresno county, Cal. Capital, $5,000,000. Directors—C. D. Keeney, U. T. Smith, Oliver Merrill, H. T. Fairbanks and W. F. Myers.

HARD MONEY CON. M. CO.—Mar. 23d. Location: Columbus, Esmeralda county, Nevada. Capital, $10,000,000. Directors—C. L. Weller, Gustave Frank, R. J. Trumbull, A. H. Lissak, Jr. and Michael Castle.

Meetings and Elections.

DANBY M. CO.—Mar. 22d. Directors—L. N. Jacobs, J. H. Tingman, B. Rich, M. W. Fox and A. D. Carvill.

JACKSON M. CO.—Mar. 23d. Directors—A. K. P. Harmon, W. E. Dean, J. Clark, C. N. Felton and George L. Ives.

EQUITABLE TUNNEL & M. CO.—Mar. 22d. Directors—D. A. Hiller, E. S. Farnsworth, Charles J. Collins, E. A. Learned, James Battersby, John Howes and F. A. Webb.

TONITE POWER CO.—Mar. 24th. Preeldent, Hamilton Smith, Jr.; Vice-Preeident, J. Baum; Secretary, R. L. Shainwald; Treasurer, Lazard Freres.

Bullion Shipments.*

Since our last issue, we have noticed the following bullion shipments:

Barbee & Walker, Mar. 22, $3,167.21; Mar. 25, $4,149.05; McCormick & Co., received, Mar. 22, $11,450; Mar. 23, $7,050; Mar. 24, $14,150; Mar. 25, $4,350; Mar. 26, $4,350; Wells, Fargo & Co., at Eureka, Mar. 23, $4,055.24; Mar. 25, $1,000; Richmond, Mar. 23, $14,209.64; Mar. 27, $24,647.62; Ontario, Mar. 23, $16,528.73; Christy, Mar. 23, $2,310.32; Mar. 25, $1,647.48; Horn Silver, in bullion, 22,373 lbs.; Mar. 27, 12 car-loads, value, $26,004.55; Northern Belle, Mar. 24, $9,016.37; Con. Virginia, Mar. 27, $28,259.20; California, Mar. 27, $28,411.80; Paradise Valley, Mar. 23, $4,194.16; Ophir, Mar. 27, $18,612.40; Tombstone, Mar. 30, $20,000; Bodie Con. Mar. 29, $6,424.

*Desiring to make our list of Bullion Shipments as complete as possible, we will be thankful to receive from mining Superintendente and Secretaries notice of all bullion shipments from their respective mines.

A DISPATCH from Cohoes, New York, says the strike in Harmony mills has become general, and 5,000 workmen are in the streets. The excitement is great. Five hundred looms are in operation.

Shellac and Lac-dye.

[By Hon. B. B. Redding.]

Mr. J. M. Stillman, of the University of California, has recently made an analysis of a resinous substance found on the creosote plant or greasewood of the deserts of Arizona. The plant is known to botanists as *Larrea Mexicana*. He read a paper on the subject before the Academy of Sciences, Feb. 2, 1880, the full text of which can be found in the *Science Record*, for February. His analysis shows the substance to contain the shellac and lac-dye of commerce, in the proportions of 61.07% of shellac and 3% of lac-dye.

Nearly all of these substances used in manufactures and in the arts are obtained from India. In that country the seed lac is found on five different plants. Insects known as *Coccus lacca* and *Coccus ficus* puncture the wood of the growth of a previous year, and deposit their eggs; the resinous matter which exudes from the wound is in some unknown manner changed by the insect, and formed into a cellular structure so as to inclose the eggs. At the same time the insect secretes and deposits a red fluid within the cellular structure, which upon evaporation is changed to a fine red powder. This is supposed to be the food of the young insects after emerging from the egg. When this work is completed the insect builds up the mass into a half globe, from the size of a half pea down to that of a pin's head, which is invariably surmounted by a small teat or nipple of the same substance. Sometimes the twigs of the plants are punctured year after year, and become so coated with lac as to be killed. Twigs thus covered are known in commerce as stick lac. The small nests, if they may be so called, when rubbed off are known as seed lac. When the twigs containing the nests are thrown into hot water, the lac is melted and floats upon the surface. It is then skimmed off and poured into narrow cotton bags, which are worked and twisted while the lac is still hot, until the lac is pressed through the interstices of the cloth upon a piece of smooth board. This is then spread by the hand into thin flakes which soon harden. It is then known as the shellac of commerce. The twigs are taken from the boiling water, which is frequently skimmed to remove dirt, leaves, etc. The water is now boiled away or allowed to evaporate, and the residue is the lac-dye of the dyer.

In Wheeler's Report, Vol. 5, of Botany, he states that Dr. Loew of his staff made an examination of the reddish brown exudate taken from the branches of the *Larrea Mexicana*, and found that it yielded a red coloring matter showing all the reactions of cochineal.

In 1867 the United States imported 784,000 lbs. of shellac. Of crude seed and stick lac there were imported into the United States in 1874, 67,536 lbs.; in 1875, 127,779 lbs.; in 1876, 10,837 lbs., the total value of which at the Custom House was $58,735, or about 28½ cents per pound. Of lac dye there was imported in 1874, 66,520 lbs.; in 1875, 42,920 lbs., and in 1876, 165,677 lbs., the Custom House value of which was $28,436, or about 10 cents per pound. This latter valuation must be an error, for the *Druggists' Circular* gives the wholesale price in New York of shellac at from 25 cents to 30 cents per pound, and lac dye at from 30 cents to 35 cents per pound.

From Mr. Stillman's analysis it is found that California and Arizona have also plants and a coccus that produce both the shellac and lac-dye, and that they are identical with the same substances imported from India.

The *Larrea Mexicana* or creosote plant is described by the botanists "as a shrub from 3 to 10 feet high, the branchlets short and very numerous; leaflets, a single pair, connate at base, two to four-tenths of an inch long, elliptic, oblong or ovate, often curved or falcate, puberulent; flowers nine-tenths of an inch in diameter, the rounded sepals silky pubescent; scale somewhat lacerate-toothed, a little shorter than the filaments."

Clarence King says it is found on all the deserts from southern California to western Texas, and from southern Utah to northern Mexico. Licut. Wheeler, in his report of "surveys west of the 100th meridian," states "that some plants depend, as the main condition of their existence, upon very dry climates is proved by the *Larrea Mexicana*, a plant that grows in considerable numbers in many parts of the Mohave desert, but not a single specimen in the coast counties;" "indeed," he adds, "standing in San Gorgonio pass, that forms a point of separation between the desert and the coast region, you may see many specimens of the plant in looking towards the east, but not a single one between this point and the coast to the westward." In the desert traversed by the Southern Pacific railroad, between San Bernardino mountains and Yuma, he found its range to extend from "about sea level up to 4,400 feet, and to be so widely spread that it may be assumed that the botanical boundaries of the desert are defined by the range of *Larrea Mexicana*." Its power to exist and thrive in deserts where the annual average rainfall does not equal four inches, he ascribes to the fact that "it is so charged with resinous matters as to make the evaporation of small particles of water quite impossible."

Mr. William Hood, Chief Assistant Engineer of the Southern Pacific railroad, in writing to me from Tucson relative to this plant, says that "probably one-half to three-quarters of all the land of Arizona west of the San Pedro river, which is not bottom land, is covered with the growth of *Larrea Mexicana*." He adds that "upon an examination of the plants he found the product of lac much larger than he expected."

The Indians of Arizona and southern California made great use of the lac obtained from this plant. With it they cemented their broken pottery and steatite bowls. They also used it to make water tight their woven grass and root baskets. Its northern limit in California appears to be Kern county, where a few specimens were found by Lieut. Wheeler. It is found abundantly in the Mohave desert.

Mr. Stillman stated, at the last meeting of the Academy of Sciences, that he had also found the lac on another plant, the *Acacia Gregii*, sent to him from Arizona.

I have procured several specimens of the creosote plant (*Larrea*) from the Mohave and Colorado deserts, and in every sample I have found evidences of the presence of the coccus. In some instances the small branches were so completely covered with lac as to prevent their further growth. Some twigs of the Larrea forwarded to me from Stanwix station, 80 miles east from Fort Yuma, are so covered with lac that this substance will weigh half as much as the dried twig to which it is attached. I send you some twigs, gathered in the Colorado and Mohave deserts, showing branches with leaves attached; also some twigs from the same bush so entirely covered with lac that it has stopped the growth of the branch.

Since the publication of Mr. Stillman's paper, an examination has been made at the various stations in Arizona between Yuma and Maricopa Wells by Mr. E. F. Gerald, traveling auditor of the Southern Pacific Railroad Company. He reports finding the plant in abundance, and everywhere covered with lac in quantities sufficient, in his opinion, to pay for gathering. At Texas Hill, a station 62 miles east of Yuma, the insects were so numerous that a large number of the plants had been killed by the complete coating of lac with which they had surrounded the branches. An examination is being made as to the presence of the insect and abundance of lac near stations in the Mohave desert. When reports are received they will be published.

There is no question as to the vast areas over which the plant grows, and that it is so abundant as to make it the prevailing characteristic flora. Possibly there may be climatic or other conditions which favor the increase of the insect in certain places on the desert and not in others. Further exploration may show that while the plant is widespread, the coccus is only local, and that consequently the shellac and dye can be obtained from the plant in some places almost without cost, while in others the cost of gathering the twigs would equal the wholesale value of the lac. I have received specimens of the plant from six different places in the deserts of California and Arizona, gathered at stations within a distance of 200 miles, and these all show the work of the insects and the presence of lac in quantities that would pay for gathering.

Assuming that the lac is to be found on the plants in the desert in the abundance that it is found in the specimens that have been forwarded to Mr. Stillman, of the University, and to me, I can see no reason why the gathering of the twigs would not afford profitable employment to hundreds of men and boys. The only capital required would be for the purchase of a tent for shelter, blankets and sufficient food to last until the first shipment of seed or stick lac could be sold. The twigs so covered with the nests of lac as to have stopped the growth of the branch are broken off, tied into a bundle and sold as stick lac. The nests of lac rubbed off the twigs and gathered in a bag are sold as seed lac. A little more capital for the purchase of a large iron pot, a smooth, hard-wood hoard or marble slab, and some narrow, coarse, cotton bags would be necessary if it was desired to make the shellac and lac-dye.

In a few weeks it will be known in what parts of the desert near the railroad the lac is to be found in abundance. Since Mr. Stillman's article on this subject was read before the Academy of Sciences, it is reported that the agents of the Chinese companies have been making an examination with a view to opening up a new and profitable industry for their people. If the lac is found in the abundance that thus far seems probable, it is to be hoped that the business of gathering it will be followed by white men and boys, for, while giving them profitable employment, it will in addition save to the country the large amounts of money now sent abroad for its purchase.

San Francisco, March 12, 1880.

The Snake River Placers.—A correspondent of the Boise *Republican* from Salmon Falls, gives an encouraging outlook for the placer mining in that district. A number of new machines have been put up this winter, and ditches are being dug for the opening of new claims in the spring. The weather was so mild in February that most of the machines were kept running a greater part of the month. Salmon Falls district hide fair to be a busy point yet, as the longer the mines are worked the more familiar the miners become with the art of saving the fine gold, and as the ground is not limited in extent the yield of dust in the near future promises to add largely to Idaho's gold yield.

The celebrated Iron mine at Leadville has been sold for $3,000,000.

How England Takes Her Census.

In Great Britain a census has been taken every ten years since 1801, and the system is now one of the most perfect in existence. Until near the close of the last century, there was no real method, and all previous estimations of the population of the United Kingdom were mere guesswork. It seems the more strange that such should have been the fact, considering that, in the American colonies, enumerations of the population had often been made by order of the home government. In 1790, a beginning was made in Scotland by Sir John Sinclair, who through his personal efforts in enlisting the co-operation of all the clergymen of the established church, collected returns which were of great value, though necessarily incomplete. After seven years he completed his compilations, and published the results in 21 volumes, probably the greatest statistical work ever undertaken and carried through by one private enterprise. Under the system adopted in 1851, the census in Great Britain is now taken in one day, the 31st of March. In 1851, 30,610 enumerators were appointed in England and Wales by the 2,190 district registrars in those countries, each enumerator having a distinctly defined district assigned to him. In Scotland the 32 sheriffs appointed the temporary registrars—generally parish schoolmasters—and 8,130 enumerators. For the smaller islands, the government appointed 257 enumerators, and in Ireland the census was taken by the constabulary. Some days before the census day, printed schedules were delivered at every house or tenement; in Wales these were printed in Welsh for the benefit of the lower classes. These schedules contained questions about the name, relation to head of family, condition, age, sex, occupation and birth-place of every person in Great Britain, and also as to the number of deaf, dumb and blind. Measures were taken to secure accurately the names of night laborers, persons out of the country, travelers, seamen, soldiers, etc. These schedules were all filled up in the night of March 30-31 and were taken up at an early hour on March 31, the collector filling up the parts that had been left blank through their negligence or inability. All unoccupied houses and buildings in course of construction were also noted. The floating population—persons who spent the nights in boats and barges, in barns, sheds, etc., were required to be estimated as nearly as possible. The enumerators were allowed one week to make their returns in, all transcribed, and the summaries and estimates completed according to detailed instructions. The district registrars had to complete their revision of the returns of their subordinates in a fortnight, paying particular attention to nine specially defined points. These revised returns were again revised by the "superintendent registrars," and then transmitted to the census office. The census was the most successful, in quickness and accuracy, accomplished in any country up to that time, and the same system has been pursued, with little variation ever since. The digestion of the census reports by the central authorities is conducted most thoroughly and scientifically, and the compilations are of the greatest value to statisticians and economists. The British system has served as a model for many other countries, where the census is now taken in one day by means of printed schedules.—*Boston Herald.*

Long American Bridges.

Since the disaster of the Tay bridge there has been some uneasiness felt as to the safety of some of the iron and suspension bridges in this country. Many of them have spans much longer than those that fell into the Firth of Tay, the destroyed spans being only 245 feet long. The bridge nearest home, and one in which Baltimore is especially interested, is that over the Susquehanna river at Havre de Grace. It has 13 spans, each over 270 feet long. It was completed in 1866 of wood, and when nearly finished a large portion of the superstructure was blown down. Since 1876 the wooden portion has been replaced with iron by the Phœnix and Edgemoor iron companies, the work being accomplished without any interference with the freight and passenger traffic of the Philadelphia, Wilmington & Baltimore railroad. The draw section of the bridge will he replaced with iron within a month or two, when it will sustain its character of being one of the longest iron railroad bridges, as it was previously one of the longest wooden bridges. The truss bridge at Cincinnati has a span of 513 feet; that over the Hudson, at Poughkeepsie, has five spans of 500 feet, and the piers are 135 feet above the high water level. The bridge across the Missouri, at Leavenworth, has three spans of 340 feet each. The span of the bridge that gave way at St. Charles, Mo., in consequence of the cars leaving the track, was 320 feet, and it has two others of 406 feet each. The bridge at St. Louis has one span of 500 feet and two of 515 feet each. The suspension bridge at Cincinnati has a clear span of 1,075 feet, while the bridge over the East river, at New York, exceeds that length, having a span of 1,595 feet. Since the Tay disaster there have been so many inquiries as to the safety of this structure when exposed to the force of a gale of wind, that the engineers interested have made reassuring statements. It is asserted that a gale of 100 miles an hour would bring a force equal to 1,506 tons, while there would be a sustaining force of 4,124 tons.—*Baltimore American.*

The Alexander Mine—A Mountain of Ore.

Isaac McConnell, of this city, recently returned from a trip to Grantville, Nye county, and is well pleased with the mining outlook in that region. The leading mine at Grantville is the Alexander, which is now producing bullion to the value of $37,000 per month. They have a regular mountain of quartz. They suppose their vein to be 200 or 300 feet in width, but have never yet been through it to either wall. The mine is opened by means of tunnels, and the ore is blasted out as stone would be taken from a quarry. The ore is extracted and delivered at the mill for eight cents per ton. All that is to be done is to blast it down, shovel it into cars, run it to the mill and dump it.

This ore averages $33 per ton, and it costs $9 per ton to mill it. The ore contains a considerable amount of iron and antimony, and after being dry-crushed is roasted with salt, when it is ready for the amalgamating pans. To ten tons of ore is used one ton of salt. The salt used is that formed in the salt fields and marshes in the vicinity, and contains a considerable amount of soda and borax; indeed it is only about 60% salt. The minerals found with the salt are supposed to improve it for the use to which it is applied. By the process in use the ore is worked to within 95% of its assay value. Recently a winze has been sunk from the lower tunnel to a point below the water level, and it is found that the ore at that depth is much richer than above, averaging $150 per ton.

In the mine they have in sight about 80,000 tons of ore with some 40,000 tons extracted and stowed away in bulkheads.

This mine is about being purchased by Alvinza Hayward and W. S. Hobart for $1,000,000. The owners—it is said—have agreed to take this price, and that all hands have gone to San Francisco to complete the trade.

The country rock is limestone and quartzite, and the mineral veins are abundant. At a point 18 miles north of Grantville are some very promising mines from which Mr. McConnell brings some rich and handsome specimens. Most of these mines are owned by men of small means.—*Territorial Enterprise.*

A Sword Forged from a Meteor.—There is now in the museum at the City of Mexico, a remarkable sword, made from an aerolite or meteor that fell in the State of Durango, Mexico. A Mexican gentleman sent to Gen. Ord, of the United States Army, a small slab or tablet, about an inch thick and six inches square, which was sawed out of the meteor. It resembled iron, and, in fact, was what is known as meteoric iron. The piece weighed two pounds. Gen. Ord sent it on to the national armory at Springfield, to be worked up into a sword for Gen. Trevino, of the Mexican Army, who has done so much to rid our border of the Indians that infested it. Considerable trouble was experienced in annealing the meteoric iron, but at last they succeeded, and, with the scabbard, it forms a very creditable specimen of American skill. The sword is a small, straight blade, and is a fancy-dress sword, the mounting representing an eagle with the olive branch and arrows, such as we see on a quarter of a dollar now and then. The grip is of silver wire, and the whole thing is very pretty. On the blade is the Spanish sentence, which, translated into English, reads: "Made of iron that fell from the skies of Mexico. Presented to G. Trevino, General of Division, by his friend, Gen. Ord, U. S. A."—*Manufacturer and Builder.*

Copper in Idaho.—As soon as the Utah & Northern railroad is completed down Snake river, copper mining will be an industry that will give employment to a great many men, and bring money into the country. There are hundreds of mines there, some of the ledges being very wide, and from 70% to 90% copper. They are near the line of the road, and in positions where they can be worked with but little expense. There are also copper mines on the Weiser, but it is not known whether they are extensive. However, those on Snake river are of sufficient extent to give Idaho a reputation abroad as a great field of this kind of mining as soon as the railroad is extended to them and they can be worked.—*Idaho World.*

The Single Track Railroad.—The test of the James single track railroad system, made recently at Antioch, is pronounced a success by all reports which have come to our notice. We are glad of it for this, if found finally to be as good as it now appears, will open to easy access many rich valleys and uplands, which now lie out of reach of the railway, and will make their products much nearer to the central markets in point of time and cost of transportation. There is a project now under way to build a single track road down the west side of the San Joaquin valley, and if this succeeds, there may be a score of cheap railway lines expected in all parts of the State.

An Old Shaft.—On the top of the Dragoon mountains northwest of Cachise Pass has been discovered an old shaft sunk upon iron croppings of the usual kind of this country. The shaft has been explored to a depth of 75 feet, but not to the bottom, nor could it be told how far it was to the bottom. The vein goes down with the shaft. An old arastra was also discovered close by, much worn, with four large drag stones. No one ever heard of it before. It appears to be very ancient as judged from the growth of shrubbery about it.

Frozen Meat from the Antipodes.

Last November a ship laden in Australian ports with fresh meat for England, which it was expected would be kept from decay by a freezing process. Our last English mails bring accounts of the arrival of this ship at London and interesting details of the voyage and its results. It may be said in a word that the effort yielded success, and that meat slaughtered in Australia in November last was served on London tables during the first week in February in good, fresh, palatable condition. This certainly is one of the most notable events of the century.

The vessel chartered for this experimeat by the Australian government was a steamer, and her course lay through the Suez canal and the Mediterranean. The work of shipping began on November 18th at Sydney. The beef was taken in at a temperature of 70° Fah., and that on this day the maximum temperature in the meat chamber in the ship was 26° and the minimum 2° Fah. On November 29th the ship left Sydney, the temperature of the sea water being 69°, the maximum in the chamber 28° and the minimum 16°. Four days were passed at Melbourne, where more sheep were taken in. Here the temperature of the sea water was 61°, the maximum in the chamber on December 4th being 32°, and the minimum 6°. Leaving Melbourne on December 6th, the temperature of the sea water rose on some days to 83°, while the highest point reached by the thermometer in the chamber was 26°, and the minimum 5°. At Aden, January 7th, the temperature of the sea water was 78°, the maximum in the chamber 21°, the minimum 5°. At Suez, January 14th, the temperature of the sea was 62°, the maximum in the chamber 23°, and the minimum 3°. At Gravesend, February 1st, the temperature of the water was 40°, the maximum in the chamber 27°, and the minimum 9°. During the voyage, however, the machine was only worked for about five hours a day. No difficulty was experienced during the voyage through the Indian ocean and by the Suez route, though naturally some had been apprehended, 23 days being spent in the tropics.

Concerning the condition of the meat when it reached the London butchers' stalls, all reports which we have received agree. It was frozen solid, and when first taken to the stalls "sawed up like so much stone." In appearance it was excellent. It sold readily, and samples cooked for the purpose of satisfying experts and reporters were pronounced very good, in some respects equal to the freshly slaughtered beef and mutton of the English butchers.

This result was gained by a process of freezing induced by the compression and expansion of air by the aid of a steam engine and air pumps. The freezing processes by the use of chemicals are regarded unfavorably by shipowners, because of the anticipated danger to vessels and its general cargo, but the compressed air process is unobjectionable.

The Victoria Regia Surpassed.

If our Golden Gate Park Commissioners propose to sustain their eminence as introducers of the majestic in floriculture, they must lay their Victoria Regia aside and open correspondence with the authorities at Florence, Italy. For we read in a European exchange that Signor E. Boccari, an Italian, has recently discovered in Sumatra a plant which he names *Conophallus titanum*, the flowers of which completely obscure the blossom of the Victoria Regia. According to the published description of this plant, the swell of the spathe is 32½ inches in diameter, and the naked portion of the sphadix measures no less than 5½ feet. The color of the spathe is a brownish purple-red, and that of the sphadix a dirty yellow, as is generally the case with flowers which, like the *Conophallus* and the *Rafflesia*, attract, by their peculiar odor, insects and animals feeding on carrion. The tuft of this plant, of which at first Beccari only succeeded in finding one specimen, was 3½ feet in circumference, and so heavy that two strong men could scarcely manage to carry it; its single leaf had a stalk 10½ feet long, and 35 inches in circumference at its base. The leaf stem is smooth, green, and thickly covered with circular white spots. The three branches into which this stem divided at its upper end were as thick as a man's leg, and by repeated subdivisions form a spread over 9 feet long, supporting a leaf whose superficial surface exceeds 15 square yards. The stalk of the fruit is about the same thickness as the leaf stem, and in the example found by Beccari the fruit-bearing portion of it was 20 inches long by 30 inches in circumference, and thickly covered with olive-shaped fruit of a reddish color. Some seeds of this plant, which Beccari sent over to Italy, have been cultivated in the hot-houses of the Villa di Seeto at Florence, and the young plants springing from them are said to be growing fast.

The oldest specimen of pure glass bearing anything like a date, is a little molded lion's head, bearing the name of an Egyptian king, of the eleventh dynasty, in the Slade collection at the British Museum. That is to say, a period which may be moderately placed as more than 2,000 years B. C.

Large deposits of black sand, said to contain platinum, have been discovered near Olympia.

Useful Information.

The Chemistry of Rust.

In a paragraph on the rusting of metals which we find in the "scientific column" of one of the city newspapers, we read that "rusting or tarnishing is always oxidation, or, in other words, the chemical union of the metal with oxygen, which it takes up from the air or water to which it is exposed."

The statement is too sweeping and comprehensive. Iron rust is what the chemist calls "a hydrated sesquioxide of iron ($2Fe_2O_3, 3H_2O$)." In its ordinary condition the metal is not affected by perfectly dry air, but if moisture is present the oxidation and hydration soon occur. The process goes on more rapidly in air containing carbonic acid. The water is then decomposed and carbonate of iron is formed; this is dissolved by the carbonic acid, the solution absorbs oxygen from the air, and the sesquioxide is deposited in a hydrated state. The succession of chemical reactions may be expressed by the following equations:

$$Fe + H_2O + O = FeO, CO_2 + H_2;$$

$$2(FeO, CO_2) + O = Fe_2O_3 + CO_2.$$

The absorption of water converts the Fe_2O_3 into $2Fe_2O_3\,3H_2O$.

When iron nails are driven into unseasoned oak timber, a black stain will be seen around the head of each nail. It is virtually an *ink* stain, caused by the formation of tannate of iron from the action of the tannic acid in the wood upon the metal, or upon a carbonate of it, which has been first formed. The "iron-mold" stains produced by the contact of wet linen or cotton cloth with iron are also due to the solution of carbonate of iron absorbed by the fibers of the cloth. A similar stain is left by ink (that is, an ordinary black ink, made by the action of tannic acid on iron), after the fabric has been washed with soap, the alkali of which removes the tannic acid. A solution of oxalic acid takes out the stain by uniting with iron to form a colorless and soluble salt, which is easily washed out.

The rust of copper, or the green film which gradually forms upon it when long exposed to moist air, is not an oxide, but a carbonate. This is often incorrectly called *verdigris*, sometimes even in books of chemistry, but that name is properly applied to the acetate of copper, which is produced by the action of acetic acid or vinegar upon the metal. When copper is exposed to the action of sea-water, as when used for covering the bottom of ships, it also acquires a green coating; but that is an oxychloride of copper, probably due to the conversion of copper into oxide by the air in the water, and the subsequent decomposition of this oxide by the salt, or chloride of sodium. The rich green tints of old bronze, or produced artificially on that which is new, are due to the rusting of the copper in the alloy.

The dark film which forms on lead by exposure to the air is probably a suboxide, but chemists are not fully satisfied as to its nature. The white coating which results from exposure to carbonic acid is the carbonate, or what is commonly known as "white lead." In water containing little or no free carbonic acid, this coating protects the metal from further corrosion; and the same is true of a coating of sulphate of lead, formed by the action of water containing sulphates or sulphuric acid. If there is much free carbonic acid in the water the deposit of carbonate is soon dissolved, leaving the surface exposed to fresh attack. The blackening of lead and of surfaces painted with white lead, by contact with sulphureted hydrogen and other sulphur compounds, is caused by the formation of a sulphide. This also forms a protective coating; it is on the whole the best preventive of corrosion in lead water-pipes. If such pipes are employed for conveying water used for domestic purposes, they should first be filled with a strong solution of sulphide of potassium (half a pound of the salt to a gallon of water), which should be allowed to remain in the pipe until the whole inside is thoroughly blackened.

Silver is another metal which rusts or tarnishes by long exposure to the air, and from various other causes, but the process is not one of oxidation. The metal has little affinity for oxygen, but a peculiar liking for sulphur, with which it is always ready to unite wherever it can find it. The amount of sulphur ordinarily present in the air, chiefly in the form of sulphureted hydrogen, is almost infinitesimal; but the silver is prompt to take the sulphur away from the hydrogen, and to veil its polished whiteness with the black compound it forms by appropriating the plunder. Coal-gas is never wholly free from sulphurous impurities, and the more rapid tarnishing of silver where gas is burned shows the presence of these in the air. Our readers are aware that eggs contain sulphur, and the blackening or browning of the silver spoons we use in eating them is the result of this affinity of silver for sulphur. The instant the spoon is thrust into the egg the chemical combination in which the sulphur exists is broken up, and a new combination, the sulphide of silver, is produced. The same happens, as is well known, with a silver spoon put into a mixture of mustard, or into a dish of boiled onions, both of these vegetables containing compounds of sulphur. We were interested, not long ago, in noticing how black a silver coin had become which had been for some time in a box with a small piece of "vulcanized" india-rubber used for erasing pencil marks. Sulphur is used in the vulcanizing process, and the silver had taken it from the rubber, or rather from the air in which a minute portion of the sulphur had been volatilized.

These familiar illustrations of the "rneting" or tarnishing of common metals show that "oxidation, or chemical union with oxygen," is far from being the full explanation of the phenomena, and that a great variety of curious and interesting reactions are involved in them.—*Boston Jour. Chemistry.*

Paper Boxes.—By a recent invention, paper boxes are made in Boston directly from paper pulp. The boxes are turned out of any size or shape perfectly seamless and of uniform thickness. After drying, the boxes are run through a second machine at the rate of 60 per minute, receiving, under a pressure of 4,000 pounds, such embossing as may be necessary. From the time the paper stock is taken from the bales until the perfect box is turned from the machine, manual labor is entirely avoided. By the use of one set of these machines 30,000 boxes can be produced per day, at less than one-third of the lowest market price of hand-made goods, and doing the work of 200 hands as the process is ordinarily conducted.

Recovery of Tin from Tin-Plate Scraps.—According to a patent by Larocque, tin scraps are mixed with finely powdered charcoal and one-half per cent of salt, and placed in a kettle that can be closed, supplied with a horizontal perforated diaphragm in the middle. The upper portion is then heated red-hot, whilst the lower is cooled with water, when the tin melts, and runs through.

A correspondent of the *Zeitg. f. Blechindustrie* states that alloys of seven to eight parts of lead and one part of zinc protect sheet iron better against rusting than pure tin or lead, and that the plate thus covered is more suitable for certain purposes than ordinary tin plate. He adds that the addition of a little antimony increases its resistance to oxidizing influences.

Good Health.

Damp Rooms, Damp Beds, Etc.—Damp rooms, as those in brick houses—in which the plastering is placed directly on the walls—are the fruitful sources of many of the acute or inflammatory diseases of our changeable climate. Rooms, also, seldom or never properly ventilated or sunned, in damp localities, with houses the cellar of which is wet for any considerable part of the time, are absolutely unfit for human residences. No families can occupy such houses, living on the north side, and ordinarily escape the rheumatism and kindred diseases. It is but little less than suicide to be subjected to such continued dampness. Of course the bedding of such rooms must be not only damp, but to a certain extent moldy, or have a musty odor—almost certain to produce colds and diseases, especially when the "spare bed" is used by those who are so unfortunate as to visit such houses. Such beds are unsafe, occupied only occasionally, even after having been thoroughly aired and supplied with fresh and dry blankets. If such localities must be occupied, it is judicious to use bedding that will absorb as little as possible of dampness and foulness—the mattress is superior in this regard to feather-beds—while almost daily airing becomes needful. Dark closets, closed trunks, bandboxes and the like, containing clothing, need often to be aired, allowing sunlight, the prince of purifiers, free access, often to be removed and placed in the direct rays of the sun, with a careful removal of all mold. Some free absorbent of moisture, freshly slaked lime, salt and ashes,' and the like, will absorb this moisture, which may be promptly removed, at least carrying off much of the dampness. These absorb more readily and more freely than the clothes do, and will obviate a part of the evils of damp houses, and yet nothing can be an adequate substitute for the light of the sun—not even a warm fire in the room.

Snow Eating Unhealthy.—A writer in the *Phrenological Journal* admonishes parents to guard their children from the practice of snow eating, claiming that it has much to do with head colds of many girls and boys, because of the chilling effect of snow upon the palate or thin partition between mouth and nostrils producing congestion in the fine membrane which lines its upper surface. As this membrane is almost entirely constituted of delicate nerves and blood vessels, inflammation is likely to follow the congestion, and perhaps degenerating into nasal catarrh, an affection so common with persons in our northern latitude.

Disinfectant for the Breath, etc.—A very weak solution of permanganate of potash is an excellent disinfectant for light purposes, such as rinsing spittons, neutralizing the taint of diseased roots of teeth, cleansing the feet and keeping the breath from the odor of tobacco smoke. While the above statements are strictly correct, we feel called upon to state that the permanganate of potassa is altogether too expensive to use for the purpose above named. A very diluted solution (1% to 2%) of chloride of zinc will answer quite as well as the permanganate, and costs almost nothing in comparison.—*Manufacturer and Builder.*

Light in the Home.

The eminent English writer, Dr. Richardson, produces in one of our contemporaries, an article called "Health at Home," which is replete with wisdom. A most important point, and one on which he dwells, is the fact that so many people are afraid of the light. "In a dark and gloomy house you never can see the dirt that pollutes it. Dirt accumulates on dirt, and the mind soon learns to apologize for this condition because the gloom conceals it." Accordingly, when a house is dark and dingy, the air becomes impure, not only on account of the absence of light, but from the impurities which are accumulated. Now, as Dr. Richardson cleverly puts it, we place flowers in our windows that they may have the light. If this be the case, why should we deprive ourselves of the sunshine and expect to gain health and vigor? Light, and plenty of it, is not only a purifier of things inanimate, but it absolutely stimulates our brains. It is in regard to sick rooms that this excellent authority is particularly impressive. It used to be the habit of physicians in old times to sedulously darken the rooms, and this practice continues to some extent even to-day. In certain very acute cases of nervous disease, where light, the least ray of it, disturbs in over exciting the visual organs, this darkening of the room may be permitted, but ordinarily to keep light out of the room is to deprive the patient of one of the vital forces. Children or old people condemned to live in darkness are pale and wan, exactly like those plants which, deprived of light, grow white. Darkness in the daytime undoubtedly makes the blood flow less strongly and checks the beating of the heart, and these conditions are precisely such as bring constitutional suffering and disease. The suppression of the light of day actually increases those contagious maladies which feed on uncleanliness. Dr. Richardson states: "I once found by experiment that certain organic poisons, analogous to the poisons which propagate these diseases, are rendered innocuous by exposure to light."

A Specific for the Whooping Cough.—It has long been known that exposure to the perfumes of a gas-house produces a speedy relief to persons suffering with the whooping cough; but how or why such a result is brought about has not been shown until of late. In explanation we give the following paragraph, which we clip from the columns of a contemporary: "A sure cure." This is the language used by George Shepard Page, of Stanley, New Jersey—not by way of professional advertisement, but simply as an item of information to the people—in reference to that distressing disease, the whooping cough. It is only a short time since the cause of the complaint was discovered. The eminent microscopists, Henry Mott, Ph. D., and Edward Curtis, M. D., find that its seat is at the root of the tongue, where countless bactsria are generated, which produce spasms. Here is what Mr. Page tells us about his sure cure: A scientist in Providence, R. I., examined the liquid hydro-carbon deposited in the bottom of the purifying boxes, used at gas works, and separated cresolene ($C_6H_5CH_3O$)—a substance analogous to phenol. He vaporized the cresolene in a closed room, in which there was a patient suffering from whooping cough. Recovery was effected in two days. Many other trials have been made, and with nearly unvarying success. No cough or unpleasant symptoms remain. The patients are restored to perfect health. Eminent physicians have pronounced this discovery of equal importance with that of quinine. If this suggested remedy for whooping cough is found to be effective, Mr. Page will be entitled to the thanks of the public for making it known.

Moist Air Not Healthful in Dwellings. Briggs, the well-known engineer, maintains the theory that the summer condition of temperature, 62° to 68°, and relative humidity, 80% to 85%, is not desirable or attainable, at other seasons, in the heating of dwellings. His argument is, that the dry air of America possesses both curative and preventive qualities of great value, and that moist air, which promotes vegetable growth, is, on sanitary grounds, not desirable for breathing. He states that the dew point is far below the freezing point of water in well-warmed and ventilated rooms, where there is nothing of that sensation of dryness which is usually held to accompany the heat of a furnace when not supplied with water for evaporation. Again, new houses that are accounted unhealthy in Europe are not so in America, and gas burned in rooms produces much less unpleasant effects in America than in England. His views on this subject are fully set forth in the *Journal of the Franklin Institute.*

More About Color Blindness.—Dr. Keyser, who has spent eight months in examining train employees of railroads that center in Philadelphia, finds color blindness in 3½% of the whole number so marked that they were unable to distinguish one color from another, while 8½% although able to tell colors, were unable to distinguish shades, and were thus rendered incapable of performing duties required of railroad men. Two of the color-blind men had educated themselves to know that red is a bright, intense color as distinguished from green, which they described as dull. But when light green was put before them, they called it red. They explained that the green light had at times shown red to them, and they had stopped the trains. But suppose the red had shown green!

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The Week.

The agricultural districts are still being favored with rain, and abundant harvests are looked for in the present season.

In the city, now that the excitement always attendant upon elections is over, it is natural to suppose that the varied departments of business will assume their general tranquility, and receive that close attention which has been turned out of its proper channel by the political contest.

There is a general advance in prices in many of the leading articles of trade, which amounts to nearly sufficient importance to merit the title of a "boom."

Real estate, though not marked by much activity, holds a more firm footing than it has done for a long period. In favorite locations there is an advance in prices asked, and holders are unwilling to accept of any reduction. In such localities rents are looking up and a better feeling is more prevalent.

The mining fever is unabated in the East. Prospectors are flocking over the mountains of Colorado, Idaho, Montana, Utah and Arizona. Everywhere are new mines being opened up and new camps being organized. Capital is flowing from the East with a free hand. Scarcely a day passes but we hear of purchases of mining property by Eastern people. All this is good for the mining interests of the coast, for we want the mines developed, even if the resultant bullion goes away from here.

One of the largest lumps of solid gold ever seen in this city was on exhibition at the office of the Pacific refinery, corner of Montgomery and California streets, a few days since. It was about 14 inches long by 7 in width and 6 in hight. Its value was estimated at $55,000.

The Board of Directors of the Pennsylvania Railroad have directed the restoration of the pay of all persons in the service of the company to the compensation in force at the time of the reduction in June, 1877, to take effect from and after April 1st.

Bullion Product, Mines and Reduction Works of Utah.

The value of the bullion turned out last year in Utah Territory, lead included, amounted to about five and one-half million dollars, made up as follows: 2,301,276 lbs. refined lead at 4½ cents per lb., $103,557.42; 26,441,359 lbs. unrefined lead at $45 per ton, $594,930.57; 3,835,047 ounces silver at $1.10 per ounce, $4,218,551.70, and 15,932 ounces gold, at $19 per ounce, $302,708; total, $5,219,747.69, to which may be added value of some small lots of ore unaccounted for. Owing to the low price of lead a good many mines and some of the smelters were closed down during the earlier part of the year, as they had been for several years before. Had the entire quantity of lead extracted last year sold at the prices now ruling, the bullion product of the Territory for 1879 would have reached $6,000,000 or more; and should present prices for that metal hold, it is estimated that the value of the bullion extracted in Utah will this year amount to fully eight and may even reach nine million dollars, as work has been resumed on many of the idle mines and nearly all the smelters have started up. Of the gold and silver turned out last year about $2,250,000 was the product of the mills and placers, apportioned among them as follows: The mill of the Ontario company, $1,165,180; Leeds district, $841,555; Bingham placers, $20,000; Stewart gold mining company, $100,000; other mills, $124,000, leaving $3,000 to be credited to the smelters. The gold-bearing quartz of Utah, so far as worked, this branch of mining being yet new in the Territory, has yielded at the rate of about $15 per ton, this gold being free and easily extracted. The yield of the millable silver ores has ranged from $60 to $100 per ton, some of these ores being free and some requiring roasting, while the smelting ores carry from 30 to 60 ounces of silver to the ton, with 25% to 50% lead.

Utah, though among the younger of our mining countries, is not without her superannuated mines and dead reduction works, some of which are to be met with in nearly all her earlier and more active mining districts. As before remarked, the most of these works, save only such as have been abandoned and given over to decay, are already or will soon be in active operation. Without attempting to give here a history of these establishments, some statements in regard to their locality, capacity and prospective production may not be without interest. To begin with:

The Ore Crushing Mills

Of this Territory, we have first the well appointed 40-stamp establishment of the Ontario company, Uinta district, situated some 30 miles southeasterly from Salt Lake City. This company have erected at their mine powerful steam hoisting works, two Stetefeldt and one White & Howland roasting furnace, the cost of their entire plant to date approximating $1,500,000. The Marsac mill in this district carries 20 stamps, 10 pans and five settlers, and is driven by a 170-horse power Corliss engine. The Empire company are about to put up on their mine here a 60-stamp mill, with revolving roasting furnaces, having already erected over their three-compartment shaft, now 400 feet deep, substantial steam hoisting works.

For working the ores in the gold mines of Bingham canyon, 30 miles southwest of Salt Lake City, are the following mills, owned by the companies mentioned: Stewart No. 1, 20 stamps; Stewart No. 2, 10 stamps; Jordan, 10 stamps; Durant, 10 stamps. Each of the three companies first mentioned, and also the Excelsior company, all of whom own valuable mines at that point, will erect on the Jordan river the coming summer quartz crushing mills carrying from 80 to 120 stamps each. In the Tintic district are the Wyoming, the Lock, the Ely and the Mammoth mills—the latter containing 27, the Wyoming 20, and the Lock and the Ely 10 stamps each. The mills of the Stormont and the Leeds companies, Silver Reef, carry each 10 stamps, the Christy and the Barbee & Walker mills at that place each five stamps. The Sparrowhawk 20-stamp mill at Camp Floyd, belonging to an English company, and for a long time standing idle, has been leased by the Carrie Steele company, and will now be run on the ores of their mine at that place. The Pioneer 20-stamp mill, put up by the Walker Bros. at Ophir canyon several years ago, has since been taken down and removed to Butte, Montana, where it is now being operated with great success on the ores of the Alice and other mines owned by those parties. There are besides the foregoing a number of small mills running in different parts of the Territory, and carrying perhaps an aggregate of 30 or 40 stamps, to say nothing of some few, generally of limited capacity and imperfect build, that have been taken down and removed elsewhere, or that are now standing idle, and which are for the most part in a dilapidated condition.

The Sampling Works and Smelters

Of Utah are numerous, and some of them of larger capacity, as the following statement of the products made last year by a few of the large establishments tends to show: At the Germania Smelting and Refining Works there were turned out 2,301,276 lbs. refined lead, 344,836 ounces silver and 2,202 ounces gold; by the two smelters run on the product of the Horn Silver mine, 9,794,130 lbs. unrefined lead, 596,249 ounces silver and 642 ounces gold; by the Mingo Furnace company, 3,925,104 lbs. unrefined lead, 245,339 ounces silver and 931 ounces gold; by the Morgan smelter, 2,673,200 lbs. unrefined lead, 257,568 ounces silver and 1,480 ounces gold, and by the Old Telegraph company's works 6,128,927 lbs. unrefined lead, 153,735 ounces silver and 92 ounces gold, considerable quantities of those metals having been turned out by some half dozen other smaller works run for a portion of the year, the total amount of these several products shipped from the Territory during 1879 having been 2,301,276 lbs. refined lead, 26,441,359 lbs. unrefined lead, 1,797,589 ounces silver and 5,693 ounces gold. The most of the sampling works and smelters in Utah are situated in the long valley extending south from Great Salt Lake, and lying between the Wasatch mountains on the east and the Oquirrh range on the west. Here is the Pasco, Mungo, Germania, Morgan, Old Telegraph and other large establishments all now running, besides several that have passed away, one having been burnt up and the others having for various reasons fallen into disuse have since been dismantled, and finally suffered to go to ruin. At Sandy, on the Utah Southern railroad 13 miles south of Salt Lake City, are located the principal sampling works, this being the point near which several branch railroads coming down from the mines connect with the Utah Southern road. To these works the smelting ores are taken and properly sampled. The agents of the smelters buy by these samplings, allowing one dollar for every ounce of silver they contain, but nothing for the lead unless it amounts to 30%; for every unit above that 50 cents is given.

Extraction of Copper by Sulphatation.

Of all the various processes employed for the separation of copper from its ores, almost all are expensive, tedious and very complicated; therefore, it is of the greatest importance to do away with the ordinary ponderous routine of manipulation and adopt a method which would give good results in much less time, and at a smaller expenditure of fuel. Consider, for instance, that complicated system of metallurgical treatment adopted in England and which is called "the English method of copper smelting," where more than half the copper consumed in the world is annually produced. The ordinary method of this process includes *ten distinct operations*—by roasting and reroasting, melting and remelting, etc., etc. But the study of the solubility of metallic salts, and the agencies by which they are precipitated—which, indeed, is the most useful and interesting branch of metallurgical research—has of late brought forth several new processes, which are technically called "the wet methods." These processes are employed to effect the separation and reduction of this class of bodies, based on their solubility either in water or in other liquids.

It is an established fact that the various minerals of the copper class are all readily converted into sulphates by the action of sulphur, in the form of sulphuric acid, on their oxides. These sulphates are soluble in water, and are precipitated by metallic iron. The action of this well-known chemical affinity is as follows: The acid and the oxygen desert the copper and transfer themselves into the iron, forming sulphate of iron (green vitriol), and the copper is deposited in a crystalline and metallic state of almost chemical purity. The theory of the process is based entirely on the above facts. The largest quantity, by far, of the ores of copper are its sulphurets, viz: the glance, pyrites, erubescite, or the horse-flesh ore (as the Cornish call it), the gray copper ore, etc., which could be converted into sulphates easily without any reagents, unless at the last stage of their roasting. Still, when oxides, or carbonates, etc., are operated upon, they must be either mixed with a certain amount of sulphurets or with a certain quantity of salt-cake (the anhydrous Glauber salts), or even with sulphate of iron. Practice points out the salt-cake to be the best, because it forms sulphuric acid with more facility.

The first establishment erected to work this process on an extensive scale was, we believe, the Red Jacket copper works, situated some four or five miles from Swansea. They effect a pretty good extraction of the copper; but the difficulty is that Mr. Bankart, the inventor, cannot convert the entire oxides (formed during the roasting) into sulphates by one operation, and his remedy in this case was to roast the tailings, with a due admixture of sulphurets, in the raw state, and continue these successive operations until almost the whole of the copper has been extracted.

But, in order to overcome this obstinate difficulty and the perpetual rehandling of tailings, the use of a certain quantity of salt-cake, or calcined green vitriol, is sufficient to effect the conversion of the entire oxides into sulphates.

The following description will give some idea of the method employed:

1. The ore from the sacks is emptied upon a drier heated by the flue of the roasting furnace. When thoroughly dry, it is pulverized, first, through a rock-breaker, with jaws set close, from which it is made to run into either a stamp mill or a drum-pulverizer, similar to Paul's. The latter gives very good satisfaction. The size of the screen depends entirely on the character of the gangue. Experiment in this case alone must determine the degree of fineness to which the ore must be ground. That the size of sand is quite sufficient for ordinary ores; for, if the particles are much finer, they form a slime which is rather troublesome during lixiviation.

2. Next the pulverized ore is exposed in a proper furnace to a low red heat for several hours. The shape, size and form of a roasting furnace is a matter of great importance. A very efficient furnace is the two-hearth reverberatory, where the cheapness of construction, the economy of heat, etc., are of great advantage. The principal object in the roasting of the ores in this process is the formation of sulphates; the vitreous copper ores, pyrites and the other sulphurets when red hot and acted upon by the oxygen of the air are changed into sulphates by oxidation of the sulphur to sulphuric acid. The metal of the sulphurets cannot unite with sulphuric acid in the furnace unless it first becomes an oxide; therefore, when the last portion of the ore is changed into oxide there is not sufficient quantity of sulphur in the furnace to add forthwith an atom to the sulphurous acid to change it into sulphuric acid, a certain portion of the ore in consequence is left as oxids, and causes the tailings to be too rich. Now comes the necessity of introducing a certain quantity of anhydrous sulphats of soda (salt-cake) or some calcined green vitriol, in order to convert the oxides that are left unsulphatized entirely into sulphates. By thoroughly understanding this simple method the tailings will be found very poor indeed.

3. After the ore is thus sulphatized it is next taken into a large filtering vat partly filled with hot water, to be leached. Care should be taken that the ore is evenly and well spread, and being thus wet it will not cake, but will permit the water to percolate uniformly through it. Underneath the hot water that flows in, a piece of board is fastened to the spout in order to keep the water from making a depression in the mass and escaping through the filter without penetrating the ore. The vat is to be covered, that the heat may be retained, because the salts are more soluble in hot than in cold water. A few inches should be always kept on the ore, and the inflow and outflow are to be regulated in such a manner that they co-operate just evenly. In order to obtain a good and speedy filtration a little knowledge how to fix a proper false bottom is required, but this is so ably explained in Kustel's works that it could be made with but very little practice.

4. The liquid, which now contains the copper salts in solution, is pumped out of the leaching-vat into a settling tank, from which it flows gently but steadily into a series of precipitating boxes filled with clean iron scraps, old boiler-tubes, etc., the copper is precipitated more rapidly by wrought iron than by cast iron, and but very slowly by iron filings, the best by far are the old boiler-tubes. About 1,750 pounds of iron ought to throw down one ton of copper. The iron in these precipitating boxes is replenished according as it is destroyed by the copper. From time to time these boxes are emptied and the cement copper is washed with water and passed through a screen to separate any fragments of iron used in its precipitation; it is then taken out of the washing-barrels, dried at a gentle heat, sacked up and could be sold as cement copper at about $400 per ton. But if ingots are preferred the cement copper could be refined in a furnace such as is used for refining blister copper, poled with a green stick of wood in the usual manner to form hydrogen, which agent takes away the last remains of oxygen. When the copper is a little difficult to refine, on account of some inseperable particles of iron in the cement, a certain amount of lead is added to it, which acts as a purifier and assists the scorification of the iron, then it is cast into ingots of pure copper.

The liquor which flows out from the last precipitating box ought to be entirely free from soluble copper salts, but it contains a vast amount of sulphate of iron (green vitriol), which could be collected by crystallization if it does not contain other metallic impurities; these crystals could be reduced by calcination, and heated for some hours at a red heat with pulverized anthracite coal in a close-vessel, to a spongy metallic iron. This spongy iron precipitates copper very rapidly from its solutions. On the other hand the calcined green vitriol could be utilized as a substitute for anhydrous Glauber salt (the well-known salt-cake) for the final sulphatation of the ore in the roasting furnace.

It is obvious from the description given that this process is simple and cheap. The roasting does not occupy as much time as the other "wet methods" do; more work is accomplished with fewer hands, and less fuel is consumed. One cord of wood will on an average convert four tons of sulphurets into sulphates, and one ton of coal ten. The lixiviation is also effected much quicker; sulphate of copper is more soluble in hot water than oxide of copper is in a solution of neutral proto-chloride of iron, or chloride of copper in a solution of common salt. Sulphurets that contain between 10% and 15% of copper could be worked by the process of sulphatation with profit, also carbonates, oxides, chlorides, etc., if they only contain between 15% and 20%.

If there should be sufficient quantity of silver present in the ores of copper to warrant its extraction—as it is often found in the argentiferous gray copper ores—a different treatment must be adopted, though sulphate of silver is soluble in water; but in forming *that* sulphate by the higher heat of the furnace the copper is changed into oxide. But as the object of this article treats only on the method of extracting *copper*, it is not within its province to treat on the extraction of silver.

Square Locations.

EDITORS PRESS:—There are two sides to every question, and, except in regard to the expense involved, the general opinion here is in favor of the proposed alterations of the mining laws. This objection could be met by allowing patent to be issued after, say $100, were expended, instead of $500, as proposed.

At present, it is simply impossible for any one to tell whether ground is open for location or not, and the result, as hundreds here can tell, is that, after a location is made, if any good prospect is struck, it is far more likely than not to be claimed under some old location. It is always a difficult thing to prove that a man has *not* done the statutory work, while it is morally certain, nine times out of ten, that the ground is really open to location, and would have lain idle unless the new-comer had made a discovery of value.

It is no answer to say that the present law requires the boundaries to be marked. Four small stakes may be set among brush, where they cannot be seen, and this is held to be compliance with the law.

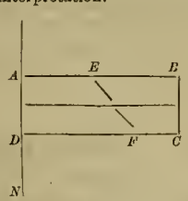
In regard to district regulations, they are almost entirely obsolete in California, and where they do exist, one can hardly tell when they are and when they are not in conflict with United States laws. For instance, most miners record locations with the County Recorder; some, however, know that a district recorder was appointed, say, 20 years ago, and still has the book in his possession, and make their record with him. What is the authority for recording with the county recorder—never appointed at any miner's meeting? And, on the other hand, what title has a man, elected 20 years ago, and who is only found in an occasional district, to keep such a record, the existence of which is scarcely known?

The obvious remedy is to have some definite record of location, such as is given in the proposed law. The time has been extended in committee to one year, which fairly meets the objection that 90 days gave no fair chance for discoveries.

The objections against vertical boundaries seem exaggerated, when it is considered that claims 900 feet long by 1,000 feet broad would be allowed.

This is more than the average length of the Comstock mines, and embraces as much as is generally made use of, and it is only fair to assume that future locations would place the croppings within 50 or 100 feet of the side-lines, leaving, in the case supposed, 900 or 950 feet on which to follow the ledge, which, at the average dip of about 65°, would give possession about 2,000 feet downwards along the ledge, and there are only two or three mines deeper than this in California.

The absolute necessity for some change is clearly seen in the following case, in which there is no room for difference of opinion as to the literal interpretation:



Let *A*, *B*, *C*, *D*, be an ordinary 1,500 feet, by 600 feet location. Section 2322 of the Revised Statutes gives "exclusive right of possession" to all veins throughout their entire depth, the top or apex of which lies inside of the surface lines of location, "although such veins may so far depart from a perpendicular in their course downward as to extend outside the vertical side lines of such surface locations; but their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward, as above described, through the *end lines* of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges."

Let *E*, *F*, be a cross-ledge dipping towards *A*, *D*, with no adverse nor adjacent locations thereon at date of this location *A*, *B*, *C*, *D*. "Continue in its own direction" the end line *A*, *D*, indefinitely, or say one mile to *N*, then, in terms of above section, the locator has a good title to the portion *D*, *F*, *N*, and as *N* can be any distance off, practically the *whole* ledge (except the mere surface) down to the line *A*, *D*, *N*, is granted, and the locator can hold against any future location on that ledge in that direction.

This is no merely theoretical case, but is under consideration at present, and that it has not been hitherto raised arises from the general ignorance prevailing in regard to the detail of these matters. Such an objection is more serious than can be made to the new proposals, especially as there is no limit to the number of locations that can be made either along or across any given tract.

The charge made in your current issue by Mr. Emersley that the proposed changes are "emphatically and unequivocally a deep-laid scheme in the interests of monopolists having a command of money," can be shown to be absurd by simply stating that such parties, if they so choose, can at present locate and hold with less outlay a hundred times more than they have ever shown any disposition to do, and one main object of the proposed change is to get the records clear of locations, dozens of which are everywhere held by one party, with no intention of working them, but simply to keep alive a blackmailing claim on any future prospector who may make a discovery of value. —R. B. SYMINGTON, Nevada City, Cal., March 29, 1880.

Legislative Matters.

As the close of the session of the Legislature approaches, it becomes evident that large numbers of the bills introduced will of necessity be killed, and that many now being introduced will fail to pass from lack of time for proper consideration.

The principal topic of interest to miners which has been discussed during the past week has been that relating to the debris question. A number of the members of the Legislature made an excursion to Bear river and Marysville, to see for themselves what the debris had done. They also visited the site of the proposed Yuba dam, which State Engineer Hall suggests as a good spot to hold back the heavier detritus, while the lighter can be held in solution and carried away by the river into the ocean. This spot is at the mouth of a gulch about a mile wide, a short distance below Smartsville. The dam proposed will be about 200 feet wide, and on the east lies a quarry from which the rock can be taken to build it. He proposes to make the dam 10 feet high at this point, and as from the mouth of the gulch to the scene of the mining the slope of the fall is 1 foot to 10, the dam would push back the debris over the whole area behind it. The bed of the dam would be made on the soft soil, and, therefore, the danger of its breaking away in case of a flood, as suggested by some members, and coming down with all its accumulations, would be very imminent. Mr. Hall, however, believes that it can be made secure, and intends, as soon as the debris reaches the top of the dam, to put on 10 feet more, thus making it 20 feet high. The whole work, however, would be in the nature of an experiment, and might succeed and might not.

On Tuesday, in the Assembly, Felton introduced a joint resolution to petition Congress to enact a law whereby all mineral patents should contain an inhibition for hydraulic miners, regarding the washing of debris upon the lowlands. Fox moved an amendment, "unless they shall agree not to run their debris into the rivers and valleys." Carr, of Yuba, opposed the resolution, as it was interfering with the business of one of the chief industries of the State. Felton retorted by disclaiming any intention to harm the miners, and he knew it would not, but would, on the other hand, be of considerable benefit to the farmers. It would merely prevent the repetition of the struggle now pending between these interests. After several motions to refer to several committees were made and lost, the House rejected the resolution by a tie vote.

The discussion on Young's substitute for the drainage bills was resumed, and Brooks moved a substitute for Chandler's amendment to Section 20, fixing the tax upon each inch of water used by the miners at 1 cent, to make it ½%, which was adopted. After recess, the discussion resumed its original position in the shape of unsuccessful attempts to amend. Young, however, succeeded in getting an amendment to Section 21, requiring the State Engineer to make maps of all unreclaimed swamp and overflowed lands, and by striking out at the end of the section the clause, "and their decision shall be final," referring to the Board of Directors relative to the correcting of lists of such land liable to assessment for benefits derived by this bill. Chandler's amendments to Section 23, providing that the assessment upon land benefited shall be paid in six equal annual payments; also, that the owner of any 40-acre tract may pay at any time before final payment and be released; also,

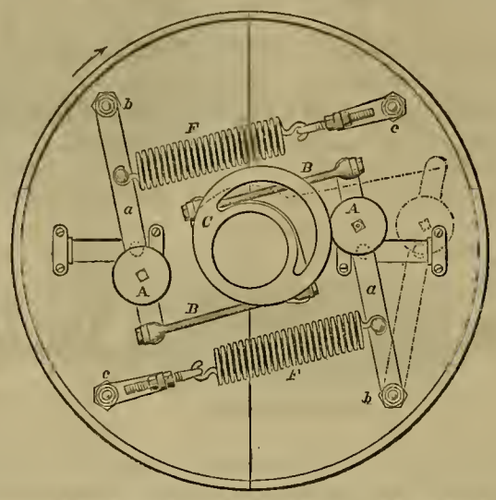


FIG. 3. THE BUCKEYE ENGINE CO.'S ISOCHRONAL REGULATOR. (See 1st page.

that the owner of one subdivision may not be held liable for the assessment on adjoining lands, were adopted. Section 25 was amended, on motion of Young, prohibiting the State Treasurer from paying out money except from the State Construction Fund or State Drainage Construction Fund, as provided in this bill, to exceed the amount of tax levy for the current year apportioned to that fund. Section 27 was amended, on motion of Carr of Sacramento, to prevent the condemnation of levees now built.

The consideration of the Young substitute for the Drainage bill was resumed on Tuesday, under the previous question which was ordered upon the same, when all the amendments to the bill were considered, except the substitute offered by Mr. Bennett. When it came up, as the last amendment for consideration, several members were desirous of speaking to the same, but were cut off by the previous question, much to their discomfiture. The substitute by Bennett was then voted down by a vote of 30 ayes to 44 noes. The original bill having been printed as amended was then ordered to be read for final passage. Numerous attempts were made to explain votes, etc., but were ruled out of order. The Speaker deciding that the previous question as ordered on the whole bill extended to the final roll-call, much dissatisfaction was expressed at this ruling, but the Speaker in support of his ruling produced authorities which substantiated his decision. Several attempts to appeal were made, but after the Speaker had stated the question in the plain manner in which he did the appeals were withdrawn, and the bill was passed by a vote of 44 to 35, Camron changing his vote for the purpose of moving a reconsideration, of which he gave notice.

The Tuttle-Brannhart bill "to encourage the mining industries and suppress stock gambling," has again evoked considerable discussion.

Braunhart moved an amendment to Section 5, to provide for the approval of bonds given by mining corporations, binding them to adhere to the provisions of this act, by the Superior Judges. Adopted. Tyler moved to amend

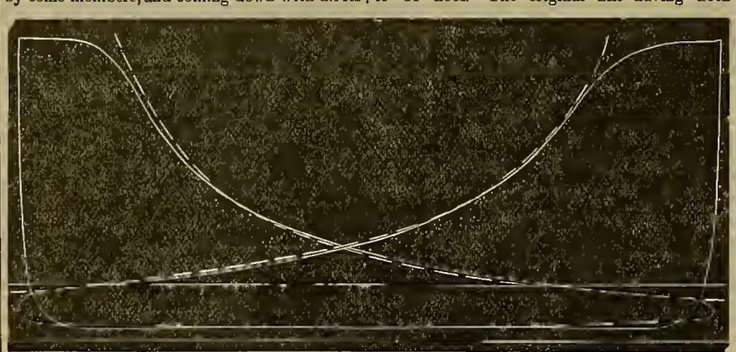


FIG. 4. INDICATOR DIAGRAM FROM BUCKEYE ENGINE. (See 1st page.)

subdivision 2 of Section 6, by striking out "weekly" and inserting "monthly"—to compel filing of statements monthly instead of weekly. Lost.

On motion of Fox the word "statuts" was inserted in subdivision 1 of Section 6. The amendment is to compel the filing of a certificate of incorporation with the Secretary of State when formed under a charter, deed of settlement, statute, or other document under which they are organized, etc.

Fox moved to strike out subdivision 2, which compels each corporation to file a weekly report with the Mining Commissioner, claiming that weekly is too often. He thought monthly would be better, as it would be impossible to comply with this provision. Braunhart objected, claiming that these reports are received daily by the head men of these corporations, and they could submit a weekly report without any more trouble than a monthly statement. The object is to compel them to submit truthful reports and not have a month in which to "doctor" them up.

Tyler said it would take a man twenty-four hours to prepare these reports, and then he would have to do it so rapidly as to not give it due consideration. He said the bill was to "cinch" somebody, which seems to suit a certain class. He then moved to reconsider the vote by which his amendment to subdivision 2 of section 6, to provide for the filing of statements monthly instead of weekly, was lost. Carried. Braunhart moved to amend the amendment by compelling them to file their statements semi-monthly.

Tyler claimed that monthly was enough. He favored holding these corporations to the strict letter of the law, but did not wish to impose a provision which it is utterly impossible to comply with. Braunhart's substitute for Tyler's amendment was lost, and Tyler's amendment was adopted. By consent the word "month" was inserted in the place of "week" wherever it occurs in the subdivision, to make it conform with the amendment adopted.

After a good deal of amending the House sent the bill finally to a committee consisting of Hartson, Braunhart and Fox, for revision. Its friends desired this action and its enemies did not object, because the delay will put the bill back a few days and imperil its final passage. The committee have prepared a number of amendments. Three of the latter sections are struck out, all of which relate to the publication of mining notices, and the perquisites of the Mining Commissioners are cut down fully one-half. The bonds to be given by the trustees and directors of mining companies for compliance with the act have been reduced from $20,000 to $10,000, and other changes are made.

The amendments proposed by the Select Committee were, with one or two changes, adopted without discussion. The percentum in Section 18, recommended by the committee, was reduced from one-tenth to one-twentieth of one per cent. and adopted as the amount to be charged by every member of the Stock Board to the buyer or seller, and the broker is required to pay this amount over to the Mining Commissioner. The only change in the section is the amount of percentum to be charged. The committee's amendment to Section 23, Subdivision 2, reduced the filing fee from $10 to $2. The House amended this by making it $1 instead of $2. The committee's amendment to Section 26 fixed the salary of the Secretary at $2,400, and that of the Assistant Secretary at $1,800. These amounts were reduced, the former to $1,800 and the latter to $1,600. Section 13 was, on motion of Nelson, amended so as to allow stockholders to be pecuniarily interested in any contract by a two-thirds vote of the stockholders, to be decided at a regular stockholders' meeting and entered upon the minutes. Nelson claimed that this was necessary, as a great many small mines are compelled to be run entirely by the stockholders. The amendment was agreed too and unanimously adopted. The other committee amendments, which are trivial, were then adopted; also the amendment striking out Sections 31, 32 and 33. The bill was then placed at the bottom of the third reading-files, which will make it No. 76 on the file.

The enacting clause has been stricken from Senate Bill No. 203 by the Senate. The bill provides that assessments and calls should not be made unless by a majority vote of the stockholders, and prohibited voting by proxy or trustee. The discussion held both the morning and afternoon sessions. Sears poured out unstinted abuse on the bill, while Enos advocated it. It was amended in the proxy and trustee clause and other respects. The motion to strike out the enacting clause was carried by a vote of 17 to 10.

The Senate on Wednesday passed, by a vote of 26 ayes to 8 noes, Nye's Mechanics' Lien Bill. It secures absolutely to laborers and material men their just dues. Hittell has given notice of reconsideration.

The Union Pacific is now receiving steel rails from three rolling mills, which are kept at work all the time to supply the company. These steel rails are being used on the main line as fast as they are received, and the iron rails are taken up and laid down on the branches. The iron rails that are in bad condition are sent to the Laramie Rolling Mills to be rerolled.

THE Southern Pacific Railroad track is laid 14½ miles east of Tucson, A. T.

RULE for finding the pressure per square inch on safety valves, when the area of the valve, weight of the ball, etc., are known: Multiply the weight of the hall by the length of the lever, and then multiply the weight of the lever hy one-half its length; then multiply the weight of the valve and stem by their distance from the fulcrum; add these three products together; this sum, divided by the product of the area of the valve, and its distance from the fulcrum, will give the pressure in pounds per square inch.

INK FOR WRITING ON TIN PLATE.—The following is a German recipe: Dissolve one gram of sulphate of copper with two drops of muriatic acid in 20 grams of water, and add mucilage of gum arahic in sufficient quantity. This ink gives a permanent deep hlack stain on tin. The addition of some pyrogallic acid has the advantage of causing the writing to he immediately apparent, that is to say, while the writing is performed.

A NEW mining camn has been started in southwestern Colorado, on the Rahhit-Ear Range, in Grand county. Ore that will average from 100 to 1,200 ounces in silver has heen taken from several of the partially dcveloped mines. One mine, the Grand Lake, produced ore that assayed 3,000 ounces of silver to the ton.

THE bonanza of Upper Oak creek, Fremont county, Col., is the Terrihle mine. It has heen developed into a mammoth vein of crystallized lead 100 feet in width. The crystallized lead runs: Best, 85%; poorest, 15%; whole lead average, 50%. It is reported that 50 tons of ore per day are takeu out with a very small force of men.

JOHN JULIAN, of Duhuque, Iowa, has devised a machine for enlarging the lower or inner end of holes for blasting purposes, so as to admit of a charge of powder being placed at one point.

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[ESTABLISHED 1860.]
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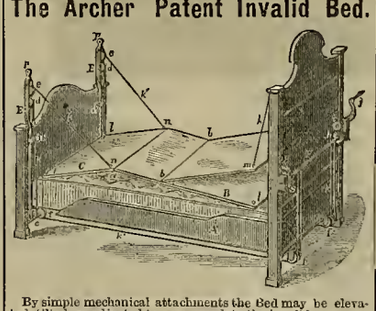
By simple mechanical attachments the Bed may be elevated, tilted, or adjusted to accommodate the invalid.
For full particulars see MINING AND SCIENTIFIC PRESS December 27th, 1879.
The adjustable bed bottom is put on top of the mattress, and by means of noiselessly operating cords and pulleys the patient may be put in any desired position.
The bed is adapted for persons in good health who wish an easy position, as well as it is for invalids.
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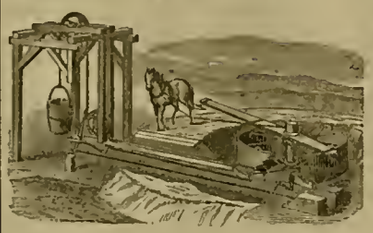

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No. 1 XX) is the Strongest Explosive Known.
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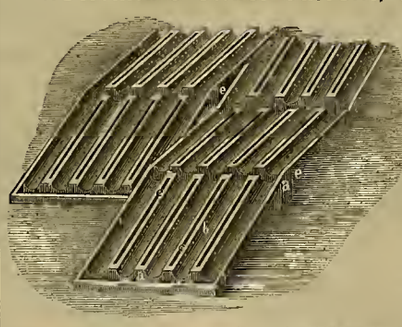
Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

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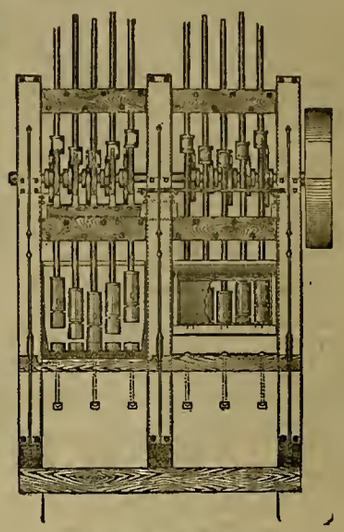

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A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

The Chance for a New Industry.

On another page of this issue we publish an important article hy Hon. B. B. Redding, concerning the occurrence of shellac and lac-dye in the dcserts of southern California and Arizona. Mr. Redding shows clearly the wide extent of territory which is now covered hy deposits of this substance, and the analyses of it hy Mr. Stillman, of the California State University, estahlish its commercial value. Here tben we have proof of the plentiful existence of the material and its quality; the problem now arising is the turning of these discoveries to practical account hy lac gatherers. The statement of Mr. Redding shows that the Chinese authorities are already on the track of this new style of surface mining, and it is quite probahle that the Chinamen will soon he on the ground in pursuit of its profits. It remaius to he seen whether the hundreds of white men whose time hangs heavily on their hande will be brave enough to set out and secure fair returns for their lahor in gathering this material, or whother the Asiatic shall have it for his enterprise. Mr. Redding's paper shows amounts of shellac and lac-dye imported and consumed in this country; also, the market value of these substances at present. Of course if considerahle amounts should he put upon the markct the price would feel its influence, hut there would seem to he a good margin for profit still, and the price which might he paid for export would prevent the enterprise from heing wholly unproductive. Mr. Redding shows also hy what a simple process the crude material is given the marketahle form.

The specimens scnt us of the plant, and of the deposits upon it are very interesting. The ahundance of the substance is clearly shown. We shall he pleased to show the specimens to any one who may call at our editorial rooms.

News in Brief.

PRESIDENT ANOELL has accepted the Chinese mission.

THE population of St. Louis is now stated to be 540,000.

ELEVEN persons were recently massacred hy Indians in New Mexico.

CHARLES VIVIAN, the actor, died at Leadville, Col., on March 29th.

DR. S. B. BRINKERHOFF died suddenly at Santa Barhara on the 26th.

JACOB FREY cut his wife's throat and then his own at St. Louis, March 26th.

RUSSIA has given 6,000 francs for the relief of the refugees from Easteru Roumelia.

THE name of Rear Admiral Leroy has becn placed on the retired liet of the navy.

AT Mendocino, March 26th, two men were seriously injured by a hoiler explosion.

THE Czar of Russia recently shot and mortally wounded his confidential servant.

WILLIAM BARTOM, 16 years old, was hanged for murder recently, at St. Charles, Mo.

SITTING BULL's people, who dcsire to surrender, will only he received as prisoners of war.

THE Russian fleet in the Pacific is said to he greater than the fleets of all other nations comhined.

AT Winfield, Ks., recently, two huildings were carried away hy a cyclone and cannot he found.

VIOOROUS military steps are taken in New Mexico to punish Victorio's band of marauding Indians.

SATURDAY'S storm did great damage in central and southern Illinois, Missouri and eastern Indiana.

THE Ute Chiefs, with the exception of Douglass, who will he rctained a prisoner, have left Washington for Colorado.

SENATOR THURMAN was taken suddenly ill a few days since while speaking, and was ohliged to leave the Senate Chamher.

THE election in this city on March 30th passed off very quietly. Only a few arrests were made, none of them for disturbance at the polls.

THE Eureka Con. and K. K. Con. mining companies have became involved in a lawsuit at Eureka, Nev., over their respective claims.

THE hell punch has heen superseded on the Sutter street line in this city hy the ticket register, recently introduced on the Clay street line of cars.

While workmen were engaged digging a well near Birmingham, Ala., a sudden current of gas hegan to flow, aud immediately thereafter petroleum started, and is flowing at the rate of 90 barrels per day.

ON the 25th of February a Chilean force of 10,000 men landed at Ilonilo, Peru, six miles from Arica, where there was a Peruvian force of about 10,000, and the position of the latter was considered critical.

THE old steamer *Pelican*, which was sold to the Costa Ricans, has transferred all her guns to the steamer *Thomas A. Whitelaw*, and the former is expected here in about three weeks for repairs.

THERE are now on exhibition in this city two sea elephant pups. They were captured off the Mexican coast, about 700 miles south of this port, and are the property of J. T. Hayes. They now weigh about 800 pounds apiece, though only a few months old.

BLAIR PROCESS.—Can any of our readers send us the particulars of the Blair process for making iron, in use at Pittshurg?

Production of Quicksilver at New Almaden for 27 Years and 3 Months.

[Prepared by Mr. J. B. RANDOL, Manager.]

Dates.	Tons of Ore. Tons.	Pounds.	Flasks of Quicksilver.	Percentage Yield.	No. of Months.
July 1, 1850, to Juns 30, 1851	2,485	.717	23,875	36.74	12
July 1, 1851, to June 30, 1852	2,321	1,290	19,921	32.82	12
July 1, 1852, to June 30, 1853	2,419	1,520	18,085	28.50	12
July 1, 1853, to June 80, 1854	8,724	.....	20,325	27.03	12
July 1, 1854, to June 30, 1855	4,554	1,300	31,860	26.75	12
July 1, 1855, to June 30, 1850	5,177	1,200	28,083	20.74	12
July 1, 1856, to June 30, 1857	5,149	1,900	20,002	19.31	12
July 1, 1857, to June 30, 1858	5,498	1,170	29,347	20.41	12
July 1, 1858, to Oct. 31, 1863	1,936	1,085	10,588	20.91	4
Nov. 1, 1858, to Jan. 31, 1861	Closed	by	Injunction		
Feb. 1, 1861, to Jan. 31, 1862	6,601	1,200	34,765	19 96	12
Feb. 1, 1862, to Jan. 31, 1863	7,640	1,400	40,391	20.22	12
Feb. 1, 1863, to Aug. 31, 1803	3,586	.660	19,564	20.86	7
Sep. 1, 1863, to Oct. 31, 1863	1.173	.....	5,520	18 00	2
Nov. 1, 1863, to Dec. 31, 1863	1,179	1,300	4,447	18.05	2
Jan. 1, 1864, to Dec. 31, 1864	11,638	1,600	49,489	13.96	12
Jan. 1, 1865, to Dec. 31, 1865	15,974	.400	47,104	11.30	12
Jan. 1, 1860, to Dec. 31, 1866	13.442	1,300	35,150	10.00	12
Jan. 1, 1867, to Dec. 31, 1867	13,011	1,933	24,407	7.19	12
Jan. 1, 1868, to Dec. 31, 1868	14,702	1,530	25,628	6.00	12
Jan. 1, 1869, to Dec. 31, 1869	12,729	.175	10,393	5.07	12
Jan. 1, 1870, to Dec. 31, 1870	10,548	1,700	14,423	5.23	12
Jan. 1, 1871, to Dec. 31, 1871	11,017	.700	18,563	6.44	12
Jan. 1, 1872, to Dec. 31, 1872	10,703	.600	18,574	6.63	12
Jan. 1, 1873, to Dec. 31, 1873	8,665	.375	11,042	4.87	12
Jan. 1, 1874, to Dec. 31, 1874	11,727	.....	9,084	2.90	12
Jan. 1, 1875, to Dec. 31, 1875	15,553	.200	13,648	3.35	12
Jan. 1, 1876, to Dec. 31, 1876	16,658	.950	20,549	4.72	12
Jan. 1, 1877, to Dec. 31, 1877	18,615	1,600	23,996	4.93	12
Jan. 1, 1878, to Dec. 31, 1878	18,472	1,808	15,352	3.28	12
Jan. 1, 1879, to Dec. 31, 1879	27,532	1,135	20,514	2.85	12
Totals and Averages	284,508	.748 2000	676,793	9.09	327

Product of Enriqueta from 1860 to 1863, 10,571 flasks. Total product of all the mines on the Company's property, 637,363 flasks of 76½ pounds each, or 52,583,052 pounds.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING MARCH 23, 1880.

225,741.—CAR TRUCK—W. T. Brown, Stockton, Cal.
225,753.—MIDDLINGS PURIFIER—T. D. Isbell, Ukiah, Cal.
225,838.—SHOE FOR GRAIN THRESHERS, ETC.—A. H. Johnson, Woodland, Cal.
225,756.—SNAP HOOK—F. Kortick, S. F.
225,759.—HARROW—P. H. Nelson, Haywood, Cal.
225,773—BALING PRESS—B. M Watts, Phœnix, Arizona.
225,776.—VALVE FOR SEWER TRAPS, ETC.—W. Wilson, Oakland, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

PORTABLE BALING PRESS.—Benjamin M. Watts, Los Angeles, Cal. Patented March 23, 1880. No. 225,773. This haling press is intended to be moved about the field from place to place where the hay lies as it has heen cut and raked, and there is no necessity of hringing the hay to the press or traneporting and stacking a quantity in one place so as to eave moving the press. This is the prime and paramount object of this invention, the peculiar combination and construction heing such that these results are ohtained hy the minimum of expenditure of time, lahor and money. This invention provides a horizontal press mounted on a wagon, to which the horses are always hitched while it is worked, and the hay in the field is baled and left in hales. These hales may then be hauled to the harn or elsewhere and stored, the product having, therefore, to he moved only once instead of twice, as when the hay ie first stacked in the field, then haled, and then moved in hales. In hilly and mountainous sections particularly, this press will he found very useful and convenient, although, of course, it may he used on any kind of ground.

MIDDLINGS PURIFIER.—Thomas D. Isbell, Ukiah, Cal. Patented March 23, 1880. No. 225,753. This device relates to certain improvements in middlings purifiers, and consists in certain peculiar arrangement of the draft openings and tuhes in a purifier, in which the material drops upon oppositely-inclined alternating shelves, hy which the lighter particles are separated from the heavier in a uniform and rapid manner.

SNAP-HOOK.—Frank Kortick, S. F. Patented March 23, 1880. No. 225,756. This invention relates to certain improvements in such snap-hooks as may he employed to connect various parts of a harness, and for any other purpose where it is necessary to have an easy means for connecting and disconnecting parts; and it consists in the formation of a hook having a spring latch-piece, which allows the link or other attachment to be easily connected with the hook or detached therefrom.

DRAFT REGULATOR FOR HARROWS.—Peter H. Nelson, Haywood, Cal. Patented March 23, 1880. No. 225,759. The object of this invention is to provide an arrangement hy which the point of draft on a harrow may he altered at will during the progress of the implement over the field. It consists of a transversely-sliding draft-har having a centrally-placed yoke or clevis, said har being connected with a lever reaching to the rear of the harrow, so that the driver, hy means of this lever, can shift the draft-har at will without stopping the horses. Suitahle arrangements are made for holding the lever, and hy it the draft-har, in any desired position. In rough or rolling ground this is specially advantageous, as it lessens the work of the tcam materially, avoiding frequent stoppages and startings.

Models and Patent Applications.

One of the burdons imposod by the Government on inventors, and which most other governments have dispensed with, is that of requiring a modol of the invention for which application for letters patent is made. The inventor must make a perfect model, in addition to the drawings, although he is not allowed to refer to the model in his specification describing the invention. He must confine his description to what is shown in the drawings. In fact half of the models sent are never really required hy the examiners, and they do not look at them. They pass upon the case by means of the drawings, and ignore the model. This heing an acknowledged fact, it seems as if the models might he dispensed with entirely, in most cases, which would he a great saving of expense to inventors. It very often costs an inventor more to make his model than all the other expenses of obtaining the patent.

We notice in the last report of the Commissioner of the Patent Office, that where he refers to the use of models in examining applications, he states that only about 50% of the models now sent are used, and he recommends the enactment of a statute to the effect that "no model shall be required or filed in any case, unless upon a written certificate, filed in the case hy the examiner in charge of the division to which the invention pertains, that it will he useful in the examination of the application, or upon the special order of the commission."

Useful Books.

SANTA MARIA, Feb. 29, 1880.

To Dewey & Co., S. F.:—GENTLEMEN:—The books I sent $3 for arrived in due time. I am very well pleased with them.

"Ropp's Easy Calculator" I have not examined much as yet, but I have seen enough of it to think it well worth the money paid for it.

To a mechanic "The 507 Mechanical Movements" is a valuable book. I had not looked at it five minutes before I got more than $1 worth of ideas that I can employ in my trade (carpenter) to a good advantage.

The "Rural Handbook" has received a more extended perusal than the other two, and I can unquestionably say that it is a perfect gem. *Me judice* it is *multum in parvo*.

M. D. MILLER.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct (or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omissions of agents.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco.

By Universal Accord,

AYER'S CATHARTIC PILLS are the best of all purgatives for family use. They are the product of long, laborious and successful chemical investigation, and their extensive use, by physicians in their practice, and by all civilized nations, proves them the best and most effectual purgative Pill that medical science can devise. Being purely vegetable no harm can arise from their use. In intrinsic value and curative powers no other Pills can be compared with them, and every person, knowing their virtues, will employ them, when needed. They keep the system in perfect order, and maintain in healthy action the whole machinery of life. Mild, searching and effectual, they are specially adapted to the needs of the digestive apparatus, derangements of which they prevent and cure, if timely taken. They are the best and safest physic to employ for children and weakened constitutions, where a mild but effectual cathartic is required.

FOR SALE BY ALL DEALERS.

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]
SAN FRANCISCO, March 31, 3 P. M.

SILVER, ½ par.

GOLD BARS, 830@910. SILVER BARS. 10@18 ₱ cent. discount.

EXCHANGE on New York, 25, on London bankers, 491@ 49½. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 90@92.

LONDON Consols, 98 3-16; Bonds (4%), 108¼

QUICKSILVER in S. F., by the flask, ₱ lb. 42½@45c.

METALS.

[WHOLESALE.]
WEDNESDAY M., March 31, 1880.

IRON.—	
American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	— @35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 5¾
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 16
Plow Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	— @—
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	6 @— 6½
Bar	— @— 6¾
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck, " "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.—	
10x14 I C Charcoal	— @10 50
10x14 I C Coke	10 00 @10 00
Banca Pin	— @25 00
Australian	— @20 00
I. C. Charcoal, Roofing 14x20	— @10 00
" " " " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	10½@— 11
NAILS.—	
Assorted sizes	6 50@6 75

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. MCGREW, Secretary.

Office—Room 7, No 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F MCGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. MCGREW, Secretary.

Office—room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F MCGREW, Secretary.

Office—Room 7, 420 Montgomery St., San Francisco, Cal.

Consolidated Pacific Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Bodie Mining District, Bodie, Mono County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Thirteenth day of March, 1880, an assessment (No. 1), of One Dollar per share was levied upon the capital stock of the corporation, payable immediately in lawful money of the United States, to the Secretary, at the office of the Company, 330 Pine St., room 5, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Sixteenth day of April, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the Eighth day of May, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

F. E. LUTY, Secretary.

Office—No. 330 Pine street, room 5, San Francisco, Cal.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Eighth day of March, 1880, an assessment (No.

41) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twelfth day of April, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the Third day of May, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) levied on the 14th day of January, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names	No. Certificate.	No. Shares.	Am't.
J R Robbins, Trustee....	17	68	6 80
J R Robbins, Trustee....	61	1000	100 00
A Hinds.....	57	1000	100 00
J K Cooper, Trustee.....	106	100	10 00
T L Bibbins, Trustee....	99	100	10 00
T L Bibbins, Trustee....	100	100	10 00
T L Bibbins, Trustee....	103	50	5 00
T L Bibbins, Trustee....	136	1000	100 00
T L Bibbins, Trustee....	142	450	45 00
T L Bibbins, Trustee....	148	50	5 00
T L Bibbius, Trustee....	150	500	50 00
T L Bibbins, Trustee....	157	100	10 00
T L Bibbins, Trustee....	163	100	10 00
T L Bibbins, Trustee....	176	50	5 00
T L Bibbins, Trustee....	213	100	10 00
T L Bibbins, Trustee....	229	100	10 00
T L Bibbins, Trustee....	231	100	10 00
T L Bibbins, Trustee....	254	20	2 00
T L Bibbins, Trustee....	436	1000	100 00
M French, Trustee.....	346	1000	100 00
H R Taylor, Trustee.....	349	50	5 00
J Griswold, Trustee.....	441	6000	600 00
Unknown.....	251	65	6 50
Unknown.....	253	30	3 00
Unknown.....	250	42	4 20
W Townsend, Trustee....	410	1000	100 00
W Townsend, Trustee....	411	500	50 00
W Townsend, Trustee....	412	500	50 00
T A Wright, Trustee.....	300	1000	100 00
J R Robbins.....	257	20	2 00
G L Waters, Trustee.....	419	200	20 00
W J Gwynn.....	402	1000	100 00
M K Lauden, Trustee....	300	1000	100 00
M K Lauden, Trustee ..	391	1000	100 00
M K Lauden, Trustee....	392	1000	100 00
M K Lauden, Trustee....	393	1000	100 00
M K Landen, Trustee....	394	1000	100 00
E A Richardson, Trustee.	315	500	50 00
E A Richardson, Trustee.	316	500	50 00
E A Richardson, Trustee.	317	500	50 00
E A Richardson, Trustee.	318	500	50 00
E A Richardson, Trustee.	319	500	50 00
E A Richardson, Trustee.	320	500	50 00
E A Richardson, Trustee.	321	500	50 00
E A Richardson, Trustee.	322	500	50 00
E A Richardson, Trustee.	323	500	50 00
E A Richardson, Trustee.	324	500	50 00
E A Richardson, Trustee.	325	500	50 00
E A Richardson, Trustee.	326	500	50 00
E A Richardson, Trustee.	327	500	50 00
E A Richardson, Trustee.	328	500	50 00
E A Richardson, Trustee.	329	500	50 00
E A Richardson, Trustee.	330	500	50 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 314 Bush street, San Francisco, on Thursday, the 11th day of March, 1880, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

T. L. BIBBINS, Secretary.

Office—314 Bush street, San Francisco, California.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Thursday, the 25th day of March, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Tuesday, the 20th day of April, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

ANNUAL MEETING.

NOTICE.—The Annual Meeting of the stockholders of the BRILLIANT MINING COMPANY, for the election of officers to serve for the ensuing year and for the transaction of such other business as may properly come before it, will be held on Wednesday, the 21st day of April, 1880, (third Wednesday in April), at 2 o'clock P. M., at the office of the Company, room 4, 309 California Street, San Francisco, California.

J. M. BUFFINGTON, Secretary.

Office—Room 4, No. 309 California Street, San Francisco, California.

A NEW BOOK.

A Treatise on the Horse and his Diseases.

By B. J. KENDALL, M. D.

35 Fine Engravings showing the positions and actions of sick horses. Gives the cause, symptoms and best treatment of diseases. Has a table giving the doses, effects and antidotes of all the principal medicines used for the horse, and a few pages on the action and uses of medicines.

Rules for telling the age of a horse, with a fine engraving showing the appearance of the teeth at each year.

It is printed on fine paper and has nearly 100 pages, 7½x5 inches. Price only 25 cents, or 5 for $1, on receipt of which we will send by mail to any address.

DEWEY & CO.,
202 Sansome St., S. F.

NOTICE!

Situation wanted as Copper Smelter, Refiner or Yellow Metal mixer. Thoroughly understands the manufacture of yellow metal and Copper. Address

CHARLES BROCKELSBY,
Goleta, Santa Barbara Co., Cal.

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PHILADELPHIA CHEMICAL STONE WARE

Manufactory,

1110 E. CUMBERLAND ST., PHILA.

Manufacturer of all kinds of Chemical Stone Ware for Manufacturing Chemists and others, such as Receivers, Acid Coolers, Mixing Pots, Stone Boxes, Worms, Elbow Pipes, Connecting Pipes, Sleeves, Pans, Dishes, Tin Crystal Jars with Lids, Still Heads, Ointment Pots, Jugs and Pitchers.

EVERY FOOT WARRANTED.

BELTING AND PACKING.

EXTRA QUALITY ENDLESS BELTS,
STEAM AND SUCTION HOSE,
AIR, OIL AND BREWERS' HOSE,
CAR SPRINGS, VALVES, GASKETS, Etc.

All Kinds of Rubber Goods Made to Order at a Few Hours' Notice.

RUBBER FACTORY
ON THE PREMISES.

Goodyear Rubber Co.,
R. H. PEASE, Jr., } Agents.
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Nos. 577 and 579 Market St., San Francisco.

Kendall's Spavin Cure

Is a sure cure for spavin, splint, curb, callous, sprains, swellings, galls, lameness and all enlargements of the joints or limbs. It will completely remove a bone spavin without blistering or causing a sore. It is also as good for man as for beast, and is used full strength at all times of the year with perfect safety. A cure which we are knowing to is a person who suffered 15 years with hip-joint lameness and was permanently cured two years ago with Kendall's Spavin Cure. Remember we claim it will cure a bone spavin and completely remove the bunch without blistering.

Office U. S. Marshal, Western Dist. of Michigan, }
Kalamazoo, April 15th, 1879. }

B. J. Kendall, Enosburgh Falls, Vt.—DEAR SIR:—I received the two bottles of your spavin cure forwarded by express in January last. I am happy to state that it performed all your advertisement called for. In three weeks after I commenced using it the spavin was entirely removed and a valuable horse restored to usefulness. Very truly yours, JOHN PARKER.

Send for illustrated circular giving positive proof. Price, $1 All Druggists have it or can get it for you.

DR. B. J. KENDALL & Co., Prop's, Enosburgh Falls, Vt.
CRANE & BRIGHAM, Agents, San Francisco, Cal.

NOW READY!

OF IMMENSE PRACTICAL VALUE TO EVERY SAW USER.

GRIMSHAW on SAWS!

History, Development and Action; Classification and Comparison; Manufacture, Care and Use of SAWS of all kinds. Quarto. 234 Illustrations.

By ROBERT GRIMSHAW, Ph. D., M. E.,

Member of the Jury on Wood-working Machinery at Paris Exposition of 1878.

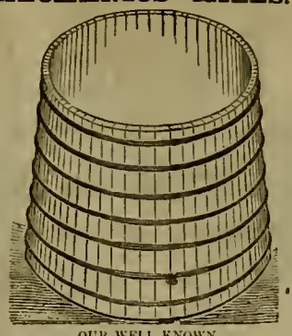
This thorough work, impartially written in a clear, simple and practical style, treats the Saw scientifically, analyzing its action and work, and describing, under the leading classes of Reciprocating and Continuous Acting Saws, the various kinds of large and small hand, sash, Mulay, jig, drag, circular, cylinder and band Saws, as now and formerly used for crosscutting, ripping, scroll-cutting, and all other sawing operations in wood, stone and metal, ice, ivory, etc., in this country and abroad. With appendices concerning the details of manufacture, setting, swaging, gumming, filing, etc., tables of gauges, log measurements from 10 to 24 feet, and from 12 to 96 inches, lists of all U. S. Patents on Saws from 1790 to 1880, and other valuable information. Elegantly printed on extra heavy paper, wide margin, copiously indexed.

Owing to an increase of nearly 100% in number of pages and illustrations since first projected, the price is this date made $2.50, postage paid

ROBERT GRIMSHAW,
624, 626 and 628 Market Street, Philadelphia.

March 10, 1880.

MECHANICS' MILLS.



OUR WELL KNOWN

WATER TANKS,

Made by machinery, constantly on hand and made to order. PAN STAVES, WOOD PULLIES and OAK GUIDES a specialty.

WELLS, RUSSELL & CO.,
Mechanics' Mills, corner Mission and Fremont street

Entirely different from other Saws. When dull, sharp teeth, which only cost a trifle, can be inserted in a few minutes, without taking the saw off of the mandrel, and no skill is required in doing it. Send for Catalogue showing their vast superiority. More of them are being sold than of any other kind, and we are altering all other kinds to the Chisel Tooth.

TATUM & BOWEN,
329 Market Street, 3 Fremont Street

NOTICE OF REMOVAL.

THE OFFICE OF THE

Vulcan Powder Company

HAS BEEN REMOVED TO

218 California Street, S. F.

San Francisco Cordage Factory.

Established 1856.

Constantly on hand a full assortment of Manila Rope, Sisal Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice.

TUBBS & CO.,
611 and 613 Front Street, San Francisco

A. S. HALLIDIE.

Office, No. 6 California Street,
SAN FRANCISCO.

Manufacturer and dealer in all kinds of

Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire
Of all Sizes on hand or made to order.

Barbed Fence Wire.

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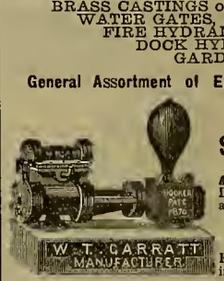

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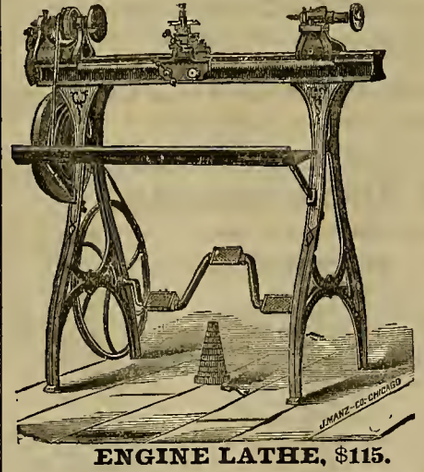

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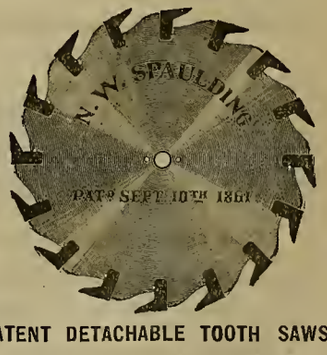

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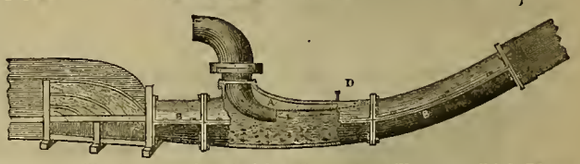

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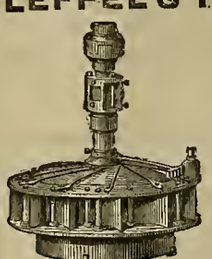

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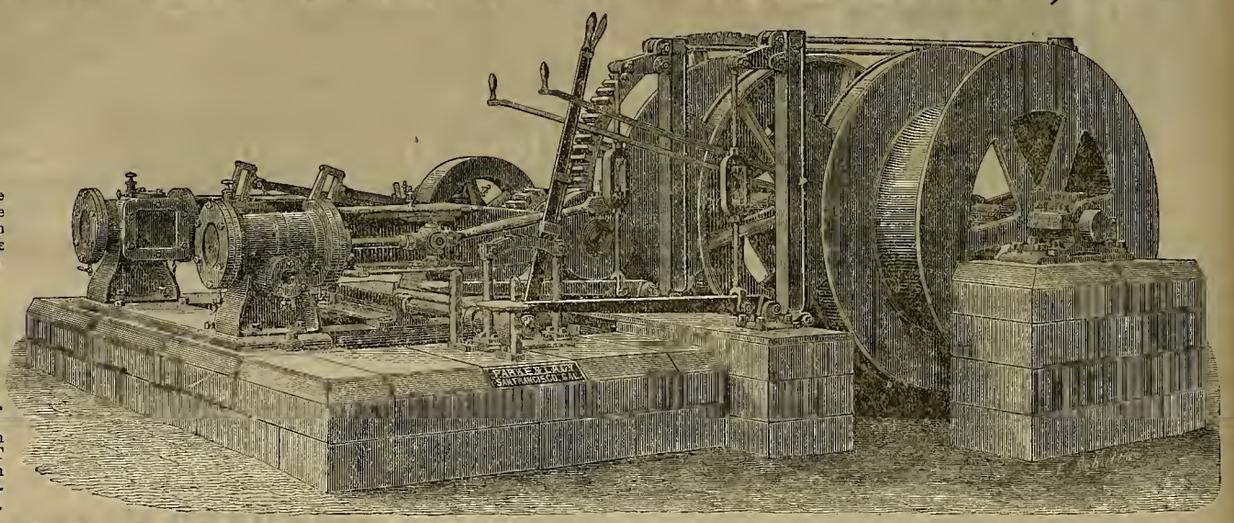

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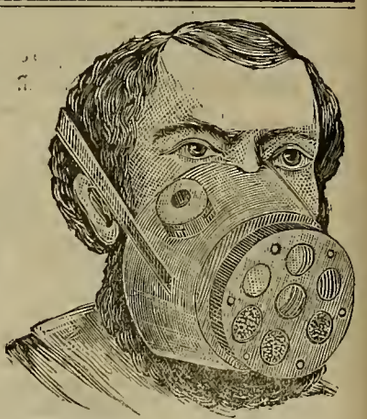

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 10, 1880.

VOLUME XL Number 15.

The Mining Season.

With the return of warm weather tho past week, every hranch of mining has been favorahly affocted, the hydraulic minore, for the first time the preeent eeason, having generally got to work. In a few localities the ditchoe etill remain somewhat obstructed with snow and ice, hnt even theee will in a very short time be clear of theso obstaclcs, and the hydraulic mince overywhere havo entered upon what promisos to be one of the moet prosperons yeare ever experienced in the hietory of this busineee. After such a long and rigorone winter, the warm weather that has at last eet in ie not likely to suffer further interruption, while tho water snpply ie almoet eure to be ample and prolonged to a later period than nenal in tho snmmer. While so mnch delay in getting to work has caueed serione disappointment to thoee engaged in thie line of mining, the promieing ontlook has kept alive confidence in the busineee, which has attracted to it more capital the past year than ever before.

In the department of quartz mining, an unwonted degree of activity is noticeable all over the Stato. Some minee have been sold, while others are being negotiated for in the Eaet—a good deal of home capital heing also inveeted in thie claes of propertiee. In almost every qnartz district, from Siekiyou to San Diego, an unsual amount of proepecting work is heing dono, while in very many of them new mills and hoieting worke will the coming snmmer be put up. What hae served to impart an additional stimulus to thie branch of mining ie the cheapnese with which we are now—through improvements made in machinery, advantagee of climate, etc.,—enabled to extract and rednce this class of oree in California, the cost in some localitiee not exceeding $2.50 per ton. Labor here is aleo becoming not only cheap, but more steady and reliable than in daye gone hy. The region of more active quartz mining in this State extende now from Plumas, south, through all the intervening counties into Freeno, and even ae far eouth ae Tulare and Kcrn countiee.

Drift operations, which have not heretofore figured prominently in the mining industriee of California, are growing apace, the old long-worked claims having yielded with their accustomed fullnese, while many new and promieing enterpriece have been eet on foot of late. In seme of the drift ground recently opened impertant developmente have already been made, while in othere, big etrikee are euppoeed to be impending. On the North Fork of Feather river, at Hepsidam and Foreet City, in Sierra county, at Chalk Bluff and Liherty Hill, in Nevada county, and at Damaecne, Yankee Jims and about Foreet Hill, Placer county, are to be found the moet lively and proeperoue drift campe in the country. Preparations are heing made for extensive wing-damming on Scott'e river, along the Trinity, on the North Fork of Feather river and on the variove other streame, that offer inducemente for thie class of operatione.

ACADEMY OF SCIENCES.—The regular meeting of the California Academy of Sciencee was held on Monday evening last, Prof. Davidson in the chair. A large number of donatione were made to the collections, inclnding two bottles of oil from the Port Orford cedar. This oil ie obtained by burning the wood. It poseeesee powerful medicinal propertiee. B. B. Redding exhibited a very artietically conetructed fishing fly, manufacturod and used by the Indians. The Indiane, he eaid, will beat ue in fishing. By the same gentleman, twigs of the *Larrea Mexicana*, with the lac ineect imbedded, were ehown. Theee he had procured from Arizona since Prof. Stillman read a paper on the subject. He expreseed a doubt about there being a eufficient quantity to make the extraction of the shellac and lac-dye a profitahle indnetry, though the proces ie very simple. It ie found on the Mohave deeert, near Fort Yuma, but ie reetricted in ite habitat. Prof. Davideon made eome very intereeting remarks upon the enbject, "Why will the contraction theory account for preservation of the heat of the eun."

Rise in the Price of Quicksilver.

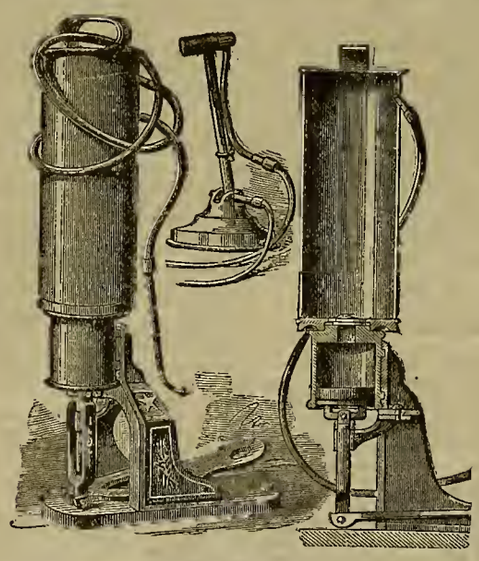
Several of our leading quicksilver mines have ehut down—owing to extraneoue causes, not from any failnre in their ability to yield an average or perhaps an increaeing output. They attribute the caneo to the legislative restrictions which, they aver, have been to a certain extent inflicted upon the free development of mining properties of this clase. The natural effect of thie closing movement was a reduction in the eupply, which was eoon followed by an advance in price as the demand increased over it. Had the effect ceased at this etage of the matter, it would not have gone beyond the ephere of mercantile tranеactions. It would merely have been an advance in the market value of an article. But when it ie coneidered that in the gold mining manipulations, and in many of the eilver milling proceesee, quickeilver ie an indiepeneahle factor in tho problem of euccees, it can readily be perceived that a eudden advance of 10% in ite cost would make a material inroad upon the profite of the mining for those two metals. It could he borne by the minere, if it did not advance still higher; but the proepective advance to etronger figuree dampened their ardor and depreeeed their hopes. Every department of our mining industry ehould he nourished and euetained. All salutary legislation is commendable toward any induetry; but when a decided antagoniem is evinced toward one of the moet important and productive of these induetriee, it cannot be continued without producing, ae in the caee in point, a direct as well as coneequential injury. Onr own market is not the only one to note the change in the production of quickeilver—it has made a material advance in the London market as well. So intimately connected are the markete of tho world, that the slightest dieturbance in any one of them is immediately experienced in all the othere, no matter how dietant they may be. The general revival of trade and commerce—which hae produced an increase of pricee in many of the leading articles of coneumption in induetrial channele—may have aided in the appreciation of the value of quicksilver. Such would be the natural effect of what is termed a "boom" in the metal market.

SERIOUS chargee have been preferred at Waehington against Judge Charles Silent, of the Supreme Court of Arizona.

THE Judge who aeeaulted ex-Secretary Delano has been eentenced at Washington to 30 days in jail and a fine of $1,000.

That Mining Bill.

Congrees is still "tinkering" witb the mining lawe, but it ie hardly probably that any of the radical changee propoeed will be made without more matnre consideration than there is time to give this seseion. We notice that the House Committee on Mines and Mining bave reported a snbetitnte for that portion of the Public Land Commieeioner's bill whicb relatee to the mineral lands. The principal changee made by the committee are as followe: The new bill allowe locators to hold their claime one year before diecovering mineral depoeite, and gives them three yeare to apply for patents. No pereon will be allowed to take up a second claim until he ehall either have etruck minorale in hie firet location or elee have abandoned it. The object of this provieo is, of conree, to prevent the wholeeale absorption of mineral lands. The new bill providee that conteets ae to priority of location, etc., ehall be eettled by the court, as at preeent. The committee fix the price of mineral lande at $2.50 per acre inetead of $5, as now charged, and they fill the hlank concerning the area locatable by any one pereon or aeeociation by making the maximum a sqnare of 990 feet, or ite equivalent, in any rectangular ehape, provided that neither dimeneion ehall exceed 1,500 feet. The committee have not yet taken formal action upon this hill, and their object in reporting it ie to have it printed, eo that copies may be mailed to all the mining States and Territoriee and elicit detailed commente, suggeetione and general expreeeione of opinion from all pereone interested. The committee will take no further action in regard to the suhject until they ehall thue have afforded the Western people full opportunity to examine and discuee the whole meaeure.



BURGESS' PATENT PORTABLE MECHANICAL BLOWPIPE.

Thie being the caee, we invite discueeion on the eubject from those who have given the matter any careful thought. The more thoroughly all the hearings of the queetion are diecueeed, the more likely we will he to get a good law, if the present one ie to be changed. We have received eome communications on the subject, which will be published next week.

THE much needed rain hae at length fallen in eufficient quantitiee to remove the enow and ice blockage, which has exieted to a greater or leee extent since about Christmae. Conseqnently, np to this time there has been but little mining done at euch mining camps as proeure their water from high altitudoe. The mines depending on water will, therefore, soon be ruehing with work.

An Improved Blowpipe.

The annexed engraving repreeents a compact, eimple and efficient device for maintaining a continuoue eupply of air under light or heavy preesure for blowpipe uee. The advantages of an invention of this character will be readily admitted by any one having had experience with the ordinary mouth blowpipe, as it not only eavee a great amount of hard labor, bnt it delivore a eteadier aud etronger blast than it is poeeible to maintain with the mouth, and it also enablee the operator to get a better view of his work, and permite of greater freedom in the uee of the hands.

The general appearance of the blowpipe ie ehown in Fig. 1, and ite internal conetruction will be readily underetood by referring to Fig. 2, which ie a central vertical eection. The pump cylinder ie mounted on an arched etandard, and containe a pieton having a valve opening upward. This pieton ie connected with the foot pedal hy a forked connecting rod, and ie moved by a slight and eaey motion of the foot. The upper end of the pump cylinder is closed, with the exception of a valve apertnre, which ie covered hy a valve, opening npward into a cylindrical air reeervoir secured to the upper end of the pump. Near the top of the air reservoir there ie a nipple, to which ie attached a flexible tnbe communicating with the blowpipe.

The mannfacturere furnieh either the ordinary blowpipe or the compound blowpipe, represented by Fig. 3. The machine is light and portahle, weighing bnt 12 pounds and measuring 24 inchee in hight. The pump cylinder is 2½ inchee in diameter with 3-inch etroke.

Thie device will be invaluahle to a large clase of artieans and especially nseful to dentiete, jewelere, chemists, aesayere, metal workers, minere and others who deeire a strong eteady hlast for reducing, fusing, eoldering, etc. It may be ueed to advantage in connection with the small melting furnacee now eo largely in nee. It is aleo of great utility to machiniete and steam, water, and gaspipe fittere in making alteratione and repaire, as it admite of the local application of a etrong heat, and thue obviatee the necessity of removing the parte. The blowpipe may be ueed effectively in connection with a gae, alcohol or oil flame.

The pipe outlet is much emaller than in the mouth blowpipe, to permit of maintaining a preesure. The air chamber is easily filled, and when charged affords a constant enpply of pure air. It ie claimed hy the manufacturere of this blowpipe that the pump poeseeeee many advantagee over the bellowe, ae a pressure of many pounde ie readily eustained with but little exertion. Further particulare may be obtained from J. Elliott Shaw, No. 154 South Fourth etreet, Philadelphia, Penn.

Flume Lining Blocks vs. Railroad Iron.

Blocke are very expeneive, and as a meane of eaving gold are far inferior to railroad iron. The following is the reeult of an experiment tried at Iowa Hill, with blocke and railroad iron nearly three years ago.

About 300 feet from the bank tho flume was divided into three eectione of about 65 feet eaoh. The first eection wae paved with blocke; the eecond, old iron raila; third, blocke. The iron rails caught nine ouncee more gold than the two other sections combined.

There are no data to show which ie the better lining, iron or etones. In the absence of euch data, however, stones are coneidered far preferable to blocks, and possibly eqnal, or even euperior to railroad iron. The principal objection to hlocke ie the great wear, thus, ae the blocke wear down, frequently cauеing the amalgam to wash out and eeek a lodgment eomewhere elee. Will eome person having a practical knowledge on the eubject complete the experiment hy giving us the comparative value of railroad iron and stonee for lining flumes.

SEVERAL thoueand men in the building trade at Liverpool have struck against a reduction in their wagee.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Letter from Southeastern Idaho.

The Caribou Gold Minee.

Editors Press:—Thinking you might liks to hsar something from this distant and isolated section of country, I forward you a few such iteme of information and news as seem to me most likely to prove of interest to your readers. And, first, a word or two touching the early history of this district, its geographical position, routee of approach, facilities for ingrese and egress, hyperhorean winters, etc., etc. The earliest discovery of gold iu this part of Idaho took place duxing the first Snake River excitement, which occurred some eight or nine yeare ago, having been made hy parties prospecting for placers on the upper waters and various tributaries of that stream. As theee parties were in search of ten-dollar diggings, they passed by the placere here, which, worked by band eluicing, the ouly method employed by them, would hardly pay such wages. After an interval of eix or eeven years, during which ecarcely any whites visited this region, a few adventurous prospectore comiug in began to work the placers in a small way, examining, at tbe eame time, the gold-bearing quartz lodes, which here so abound that they at once arrested their attention. Finding these lodes to be not only numerous, but large and exceedingly rich, tbese prospectore proceeded to make locations, and news of the discovery spreading abroad, a considerable population was lest year drawn into this neighhorhood.

Location, Means of Approach, Etc.

Tbe Carihou district, which derivee its name from a high mountain in the Snake River range, is eituated in Oneida county, which occupies the extreme southeastern angle of Idaho Territory. Centrally coneidered, the district lies nearly 100 miles in an easterly direction from Oxford, nearest station on the Utah & Northern railroad, with which point it will eoon be connected by means of a good wagon road, now partially completed. The country being elevated and mountainous ie naturally difficult of approach, and has a rigorous winter climate, the roads for the past three months having been most of the time impassable to teams by reason of the deep snow. They are now again open, and travel over them having been reeumed, will not again be interrupted before next winter, and probably not tben, as business will by tbat time have been so increased as to warrant effective meane being taken to keep tbem conetantly open.

Gulch and Hill Digginge.

Wbile there is a good deal of placer mining being done here, tbie business hae already become secondary to the quartz intereet, which latter must soon render Caribou conspicuous, even in a country famed for its great mineral wealth. The ground for several miles around Iowa Bar (principal center of the placere), has been pretty thoroughly prospected, and about all considered worth locating taken up. We have here both hill and gulcb diggings—tbe latter worked by band and ground sluicing, and the former by hydraulicing, at which there will be a good deal done the coming summer, as a number of ditcbes for bringing water on this class of claime have been completed, with the prospect of others being built this season. These ditches are ehort, from two to four milee long, and of moderate capacity, the quantity of water that can here he easily commanded being rather limited. With longer ditches, bowever, euch as will ultimately be constructed, almost any amount of water could be obtained. As yet, hydraulicing has been carried on bere in only a small way—that is, small compared witb the scale on which this branch of mining is conducted in your State. We have, however, the gravel deposits, and will eome day, when capital comes to onr aid, attack them more after the manner of California. Meantime, a good many miners will find profitable employment wasbing, hy the present lese effective methods the gold-bearing deposite here distrihuted over a considerable area of country. The product of onr placers amounted last year to $220,000—a sum that will probably be doubled this year. It is, however, in her

Auriferoue Quartz Lodes,

That the great and lasting wealth of Carihou reste, and which in the course of a very few years must distinguish this district for its large and profitable gold production. While these lodes are not scattered over such a vast area as in Dakota and California, they are quite as large as any found in either of these countries, the ore here being of a much higher grade than occurs in Dakota, and higher even than the average in California. While some little work has been done on several other ledges, the following comprises a liet of the more extensively developed and promising mines in the district.

On the Robinson Seriee of Locations,

Lying on the northerly slope of Carihou mountain and centrally on the great mineral belt that traverses the country in a eoutheasterly and northwesterly direction, a main shaft has been sunk and connected at its bottom by an incline run 220 feet from the point of location, ths whole being in first-class ore, of which there is now more than 1,000 tons on the dump, with several thonsand tons in sight. This ledge is over 20 feet wide, and shows a vast outcrop of quartz extending without a hreak for 1,100 feet. The work here is bsing done by contract, the ore extracted in the course of exploration more than defraying current expenses. A 40-stamp mill will he put up on this mine as soon as the road will admit of its being freighted in this spring. This, in connection with several other valuable properties lying near it, is owned hy Messrs. Rohinson, Farran & Tiernan, all men of means and experienced quartz miners. The Nahoh and Petereon locations, adjoining the above and being explored in much the same manner, are both making sucb satisfactory exhihits of ore as eerve to already establish for them a great prospective value. The Oneida, the first and one of the hest claims taken up in the district, ie beiug opened hy a tunnel driven on the course of the vein, now in several hundred feet and all the way in the rich tractahle ore characteristic of the country. Theee claims are all located on the northerly face of the monntain. On the eouth eide are the Northern Light, Silver Star, Orphan Boy, Paymaster and Virginia, displaying, under a considerahle amount of exploration, the same evidences of large and permanent wealth, the ahove propertiee insuring for Carihou a rapid development and prosperous future, were there no otber mineral deposits of value in the district.

The Ledgee and Oree.

Here are all that the most captious quartz miner or exacting capitalist could require, the former being of great eize, ranging from 20 to 30 feet in thickness, well walled, regular aud compact, while the ores, a free gold-bearing quartz, carrying from $25 to $60 to the ton fill the fissures they occupy from side to eide, and from the very surface to the lowest points to which they have yet been exposed. With lodes so large and well etocked we have here an abundance of water and timber, insuring always cheap ore extraction and reduction, as well as the meane for protecting ourselves against the cold weather that here prevails for three or four months in the year. In addition to our mineral resources we have in this part of Idabo quite a good deal of

Farming and Grazing Land,

The former situate mostly in the following localities: Round valley crossed by the railroad, and which is to be irrigated by water from Cottonwood creek, a canal having already been projected for that purpose. Connecting with this on the north ie Cache valley, emaller in area, but very fertile and containing tbe two growing towns of Oxford and Clifton, the land here being all taken up by farmers and etock raisers. Port Neuf valley, near the source of the river of that name, is filled with cattle, there being here much excellent pasturage., Blackfoot valley is also noted for its fine grase, mucb etock being kept here and great quantities of hay put up every summer. Marsh valley contains much good land, but being within the limits of the Fort Hall Indian Reservation, is not open to settlers. Nearly all the land in these valleys can be irrigated from the numerous large streams that descend from the high mountains around them.

X. Y. Z.

Iowa Bar, March 30, 1880.

The Public Land Commission.—No. 3.

Editors Press:—The membere of this contemptible commission consist of Clarence King, Director of tbe Government Geological Survey, Gen. Williamson, Commissioner of the Land Office, Prof. J. W. Powell, A. T. Britton, a Washington lawyer, and Tbomas Donaldson, who once lived in Montana. If they possess any sympathy with the poor hard working miner or adventuroue prospector, they have failed to show it in the recommendations they make to Congress in regard to mining laws. The ridiculous propoeition the commission makee in reference to the sale of timber on Government lands, exemplifies in a etriking manner how thoroughly incapable it is to adviee any practical measure in Land Office business. It recommends that timber ehould be eold without title being given to tbe land it is growing upon.

All trees beyond eight inches in diameter are to be sold, all below that size to be reserved from eale. Now, any practical timberman knows that in felling a large tree many small treee are broken, or have to be cut out of the way of the loggers; is the purchaser of the larger logs to he prosecuted as a trespasser and tbief, if he destroye the reserved saplings growing in their vicinity? Then the commission proposes to sell grazing land, and issue patents for it, while reserving the minerals it contains. It is inclined to grant easments to the patentee, if mines are opened in bie land. In other words tbis wondrously wise commission, while proposing changes in onr really excellent mining law of 1872, because as is falsely alleged its requirements lead to costly litigation, is prepared to enact a law in respect to pasture lands that would inevitably involve the purchasers in similar evils.

Will Congress act on the recommendations of this commission of wild theoriste? A Congress that passed a mining law a few weeks ago, whicb enables a prospector to save $100 worth of assessment work by eimply remaining idle two days, is capable of passing almost any absurd law that is brought before it. Under tbe law refsrred to, a prospsctor who finds a lode on the 31st day of December, 1880, will, if he locates on that day, have to perform work upon it of the value of $100 hefors Decemher 31, 1881, but if he covsrs up his lode, and locates it on January 2, 1881, he will not ue required to do any work upon it until Decsmhar, 1882.

Having directed attention in your pages to the ohnoxious character of the mining legislation proposed by the Puhlic Land Commission, I havs only to say now, that it rests with miners themselvss, whethsr they are to hs saddled with the ohjectionahle laws alluded to. They ought to meet iu their various districts, and pass resolutione condemning the proposed changes. It is to he regretted that we have no fit representative of practical mining interests in Congress at the present time, hut a pressure might he brought on such representatives as we have, that would serve the end in view: the defeat of a bill which, if passed, will ruin mining prospectors, and paralyze the mining husiness of the country.

J. D. Emersley.

Dos Cabezas, Arizona, March 22d.

Mt. Lassen.

Editors Press:—If my abilitiee as a descriptive writer were not so slender, I would like to describe Mt. Lassen and the country round about there in your valuable and much appre ciated paper. Mt. Lassen is eituated near the old trail of the Fredonner pass over the Sierra mountains, and unquestionably the lowest of any of tbe six principal passes over these mountains. It is in north latitude 41° 15′, and from the report of the topographical surveyors tbat were up there moet of the time last summer, is 11,000 feet above the sea level, and near 1,000 higher than heretofore estimated. It lies iu the southeast corner of Shasta county, and three other counties corner near it—viz., Tehama, Plumes and Lassen. The country surrounding it is not well suited for agriculture, but in the valleys where the land can be irrigated I have raised the finest of timothy grass, potatoes and most of the hardy vegetables. It is surrounded by the finest forests of sugar pine, yellow pine, fir aud cedar, the latter growing to the extreme timber line, only one or two thousand feet from its snow-covered summit.

If it had beon your privilege, as it has been mine twice, to stand upon its proud summit you would pronounce it a magnificent mountain. Among its rugged rocke on its highest peak, he geodetic eurveyors built their stone house, where they could see a reflected light for a hundred miles, and could telegraph to and from their main camp beyond Reno, wbich they did when they wanted their men to break up camp there and move to Mt. Shasta.

Thie corner of Shasta can not only boast of this noted mountain, hut of four otheresurrounding it over a mile high, a half dozen that are between 4,000 and 5,000 feet or three-quarters of a mile high, with a waving eea of lakes, emaller mountains and hills in the distance, to be seen hy the beholder from this great natural obserватory. On its sides may ho seen many natural curiosities—hot sulphur springs and fresh water springs flowing from its rocks, and after running in their own channele a few rods, commingling and forming a tepid water—ahout right for a pleasant bath. There are very few indicatione of minerals, only traces of cinnibar and ashestos, the latter being found in almost all of the volcanic rocks you break on and around the mountain.

Prof. Carr, from Millville, who visited the mountain eome two years ago, said the rock containing asbestos is very mucb like the volcanic rock around Mount Vesuvius; it is almost as light as pumice etone, and can he hewn into any shape easily.

In my next letter, if you see proper to publish this, I will attempt a description of some of the numerous lakce surrounding this Lassen mountain.

J. E. S.

Cottonwood, Cal.

Puff Balls for Food.

Editors Press:—Almoet every one is familiar with the common puff balls of our fields, and yet but few are aware that they constitute a choice and valuable article of food. A knowledge of the proper time to gather them will prevent any injnry, and when once tried there will he no hesitancy to repeat the experimsnt.

They vary in color from snow-white to almost black on the surface, but when young and edible are a creamy-white within and of the consistency of fresh cheese. One of them is eometimes enough for an entire meal for three or four persons. When bright yellow stains appear they are to be rejected as injurious. Like all mushrooms, they are good only when young, and must be eaten while fresh, as they soon decay and become poisonous. There is no danger, if one ie careful to observe the above directions. If the odor or taste is unpleasant, they are too old and mnst be discarded.

They may be cut in thick elices and broiled as a steak, or in thin elices and dipped in egg and bread crumbs and fried. I prefer them cooked with cream and seasoned with butter, like oystere, and then served on toaet. It is a great pity that so few know of their value.

Henry Loomis.

San Rafael, Cal.

Some Old Mexican Mines.

William Jennings, who has rssided in Msxico for the last 31 years, writes us the following from Bahacomri district, some seven lsegues from Arispe:

This district was discovered in the latter part of the last century, and extensively worked hy ths then Governor of the Occidente, (which comprised the now States of Sonora, Senaloa and Lower California) Don Alejo Garcia Conds, his principal mine was ths Carmen, and from his own written statement when he left to join in ths war for independence, he left ths mine in Bonanza, there being 18 inches of ore that weighed one-third its weight in bullion worth $2½ per ounce. Thie mine has several openings, in three of which I have found ore. In one the vein is six feet wide, with ore that assays from $100 to $500 per ton, which with the gold, makes it worth from $200 to $1,000 per ton. The prospect is the moet flattering I have seen in my mining experience. The mine of greatest note nowadaye is the San Francisco, or as the Mexicane call it, the mine of the hig tunuel, which is 1,800 feet in length—900 feet before the ore vein was reached, and an equal distance after the vein was passed through—it is owned by Mr. Matios Aleua. This is truly a most valuahle property, and doee not take its proper place witb mines, as it has not been worked for the last 14 yeare. The ownere were Frenchmen, and during the French invasion of Mexico, got into difficulties which are now eettled, and Mr. Alsua is to commence work in April next. To this mine there is an immense tunnel, baving an average width of 12 feet hy 15 feet in hight; the works from the tunnel are down 210 feet, showing large quantitiee of ore all the way down. There are several pillare of ore in this tunnel that will average $7,000 per ton and some as high as $20,000. From the tunnel to the surface it ie about 400 feet, and ore in the croppinge for the whole length of the claim. I have located the first extension northweet of this vein. On my location there ie an open cut some 30 feet deep hy 50 long, the ends and bottom of whichare in oreassaying 50 ounces per ton, wortb $100 here. There is ore enough in sight for a 10-etamp mill. The vein is 10 feet wide and the croppings for a hundred yards are in ore.

There are other locations in this district, but I do not wish to try your patience with a description of their prospects, hut will add that were they in your Territory, they would be worth millions.—*Arizona Citizen.*

Weighing an Elephant without Scales.—An Indian writer relatee an interesting anecdote concerning Shahjee, the father of the first ruling prince of the Mahrattas of Hindostan, who lived at about the beginning of the 17th century. On one occasion a certain high official made a vow that he would distribute to the poor the weight of his own elephant in silver money; but the great difficulty that at first presented itself was the mode of ascertaining what this weight really was; and all the learned and clever men of the court seemed to have endeavored in vain to construct a machine of sufficient power to weigh the elephant. At length, continues *Little Folks*, it is said that Shahjee came forward and suggested a plan which was eimple and ingenious in the highest degree. He caused the unwioldly animal to be conducted along a etage, specially made for the purpose by the water side, into a flat-bottomed boat; and then, having marked on the boat the bigbt to which the water reached after the elephant had weighed it down, the latter was taken out, and stones suhstituted in sufficient quantity to load the boat to the same line. The stones were then taken to the scales, and thus, to the amazement of the court was ascertained the true weight of the elephant.

The Mysteries of Tulare Lake.—Fourteen human skulls ranged round in a circle, were found on an island in Tulare lake, California, a few weeke ago. The mysterious reminders of some lost romance were in the middle of the island, a small patch of grass, thick brush and pigmy cottonwood trees. No other bones could bo found near them. Near by on the shore of the island were two hute of basket work, but hoth untenanted. Tulare lake probably is the most mysterious epot on the continent. It is 300 miles south of San Francisco, on a great plain. Ae the traveler approaches, the water appeare to be higher than the land. The dry land of the plain gives place to damp soil a mile or so before the water is reached. When the margin is found at last one may wade out for more than a mile and not get in above the knee. The lake rune 40 miles. The bottom is formed of powerful clam shells, and there are hundreds of small islands and hunches of tules. Millions of white birds of the gull kind tenant the islands, flock high in the air, or skim the still water. In the Indian eummer the whole lake ie veiled in mist. Mounds have been found all along the shore, and before many months the whole bottom will show tracee of a submerged city.

A Canyon City especial says: It is stated that agents of the Denver and Rio Grande railroad are bringing 2,000 men from Omaha to work on the Leadville extension of that road, and will have trains running into Leadville in 75 days.

The first iron works in America were erected in 1619, at a place called Falling Creek, a branch of the Jamee river, not far from Jamestown, the first settlement of the Virginia Colony, 32 miles from tbe sea.

MECHANICAL PROGRESS.

Successful Device for Grinding Chilled Iron Car Wheels.

The desirability of having car wheels perfectly round is conceded by all railway men. As a matter of fact, it is doubtful if any of the chilled iron wheels in use are perfectly round, and new wheels will often be found to vary 1-16 to 1-8 of an inch, and even more, from being perfectly true. Wheels in service also are far too frequently flattened by being slid, as a result of carelessness on the part of the brakeman or of the engineer in control of the air brake. Of course when a wheel is not perfectly round there is much more danger of its being held by the brake and flattened.

On the Virginia & Truckee road, in Nevada, it has been found that 85% of the chilled wheels condemned as unfit for service, were flattened wheels. This, of course, is an unusually large proportion, as the curves and grades are extremely severe and numerous on this road, but on even the most level roads the number of wheels flattened in a year is astonishing.

A process of truing wheels by grinding, invented by Mr. J. H. Gowan, formerly master mechanic of the Virginia & Truckee railroad, and owned by the Chilled Car Wheel Grinding Co., has been adopted by the road named, and 16 pairs of wheels trued by this process were placed in operation in October 1, 1877. These wheels have made upwards of 100,000 miles and still appear in perfect order, although subjected to unusually hard service. This is a remarkable showing, and indicates the possibility of a very great economy in railway operations. If flattened wheels, instead of being melted up for old iron, can be trued and again placed in service, it is evident that the saving will be enormous—the inventors of this device claim nearly 50%. The grinding is done by placing a pair of wheels, after being fitted on the axle, upon solid bearings and slowly revolving them while a solid emery wheel, 18 inches in diameter, is revolved in the opposite direction against the face of each iron wheel at a speed of 600 revolutions per minute.

One of these machines has just been put in operation at the shops of the Chicago, Rock Island & Pacific road. It proves that the best new wheels are very much out of true, and the company now proposes to have all its passenger car wheels ground down, being satisfied that the process will add to the smoothness of the cars in riding, will be easier on the springs and on the track, and will do much to prevent the flatteniag of wheels by the brakes. They will also have the flattened wheels ground, and expect to save a large number in this way which are now condemned as old iron.

It is expected that one machine will grind from four to six pairs of wheels per day. The royalty charged for the use of a machine is 50 cents for each wheel ground. A machine will cost about $750, and the cost of the emery is from 8 to 25 cents per wheel according to the condition of the latter.

The invention has been in use over two years on the Virginia & Truckee road, and is also used by the Central Pacific road with very satisfactory results.—*Railway Age.*

Diameters and Number of Teeth for Gear Wheels.

Rule 1.—As the number of teeth in the wheel + 2.25 is to the diameter of the wheel, so the number of teeth in the pinions + 1.5, to the diameter of the pinion. Example: The number of teeth is the wheel = 210; the diameter of the wheel = 25", and number of teeth in the pinion = 30; to find the diameter of the pinion: As 210 + 2.25 is to 25, so is 30 + 1.5 to 3.7102 the diameter of the pinion.

Rule 2.—To find distance of centers between two gears (or gear and pinion). Rule: As the number of teeth in the wheel + 2.25 is to the diameter of the wheel, so is half the number of teeth in pinion + half the number of teeth in wheel, to the distance of their centers. Example: The number of teeth in wheel = 210; the diameter of the wheel = 25"; and the number of teeth in the pinion = 30; to find the distance at which their centers should be placed. As

$$210 + 2.25 \text{ is to } 25 \text{ so is } \frac{30 + 210}{2} \text{ to } 14.1342 \text{ inches}$$

the distance of their centers.

I also give some rules as to velocities. When wheels are applied to communicate motion from one part of a machine to another, their teeth act alternately on each other; consequently, if one wheel contains 60 teeth another 20, the one containing 20 teeth will make three revolutions, while the other makes but one. From this the rule is derived; namely: Multiply the velocity of the driver by the number of teeth it contains, and divide by the velocity of the driven, the quotient will be the number of teeth it ought to contain. Or, multiply the velocity of the driver by its diameter and divide by the velocity of the driven, the quotient will be the diameter of the driven.

If the velocity of driver and driven are given with the distance of their centers: The sum of the velocities is to the velocity of the driver multiplied by the velocity of the driven as the distance of centers is to the radius of driver multiplied by the radius of driven.

Example 1.—If a wheel that contains 75 teeth makes 16 revolutions per minute, required the number of teeth in another to work in it, and make 24 revolutions in the same time.

$$\text{Here} \frac{75 \times 16}{24} = 50 \text{ teeth; the answer.}$$

Example 2.—If a wheel 64 inches in diameter, and making 42 revolutions per minute, is to give motion to a shaft at the rate of 77 revolutions in the same time; required the diameter of a wheel suitable for that purpose.

$$\text{Here} \frac{64 \times 42}{77} = 34.9 \text{ inches; the answer.}$$

Example 3.—Required the number of revolutions per minute made by a wheel 20 inches diameter, when driven by another of 4 feet diameter, and making 46 revolutions per minute.

$$\text{Here} \frac{48 \times 46}{20} = 110.4 \text{ revolutions.}$$

Example 4.—A shaft, at the rate of 22 revolutions per minute is to give motion by a pair of wheels to another shaft at the rate of 15½; the distance of the shaft from center to center is 45½ inches; the diameters of the wheels at the pitch lines are required.

Here $22 + 15.5$ is to 22 as 45.5 is to diameters required. $\frac{22 \times 45.5}{22 + 15.5} = 26.69$, number of inches radius of the driven wheel, which doubled gives 53.38 inches, the first diameter required, and 45.5 inches − 26.69 inches = 18.81 inches, is the radius of the driver, which doubled give 37.62 inches the second diameter required.—*T. W. McCabe, in American Machinist.*

To Galvanize Small Articles of Iron.—A correspondent of the *Manufacturer and Builder* describes, as follows, the difficulties he encountered in trying to galvanize some small iron hooks: "I could not make the zinc take to the iron. I used a pint of sulphuric acid, pint of muriatic acid, pint of sal ammoniac, and zinc enough to cover the hooks. I first dissolved the zinc with muriatic acid, then I reduced the sulphuric acid with water. I then dissolved the sal ammoniac, then I dipped the hooks into the sulphuric acid, then after washing it off, I then dipped it into the muriatic acid; after taking it out and letting it stand for some time, I then dipped it into sal ammoniac, after taking it out and letting it stand some time, I then dipped it into the zinc, but on taking it out the zinc would not stick to it. Can you tell me where the trouble is?" The editor answers his query as follows: Clean the metal by pickling in the dilute acid, and scouring (or tumbling) with moist sand, if necessary. Rinse quickly in pure water, pass through the chloride of zinc solution, and then transfer to the zinc pot. Keep the melted metal covered with dry sal ammoniac. Moist iron rusts very quickly when exposed to the air, and unless the surface is perfectly freed from this oxide it will not take the zinc.

What is a Carload.—It appears that the load which may be most economically placed upon a freight car is undergoing some considerable modification. The tendency to increase the load is strikingly shown by the fact that the United States Rolling Stock Company is now building, in Chicago, 500 cars intended to carry 20 tons each. The dimensions of these cars are the same as of those built heretofore by this company to carry 16 tons. They weigh 20,200 lbs.; those built in former years weighed about 24,000 lbs., and were intended for 10 tons but were capable of carrying more, although this has not been understood by railroad managers, until they were taught so by shippers who would load them to their full capacity. These cars are for no particular road, being built for leasing. It is notable that these 20 ton cars weigh less than those for which 10 tons used to be considered the maximum load. Of course the heavier load is more profitable, provided it does not tell too much upon the car and track.

A File of Novel Construction.—Mr. J. Kirkwood, of Edinburg, Scotland, has recently invented a new file for soft metals and wood. It is formed of about two hundred separate pieces of steel, connected by an iron bar, which is passed through, and binds them together by a screw. The advantage claimed for the file is, that filings of soft metals or wood can be got rid of by simply loosening the screw, and thereby separating the plates, this being done with very little delay or inconvenience. Each file will, it is said, last three years, outwearing 30 dozen ordinary files. The cost of the latter would be £36 ($180) and the saving that would be effected by using the new file would be £32 ($160). Mr. Kirkwood's file is said to be capable of performing quicker and better work than the cut files in ordinary use.

A Floating Railway Station.—The latest plan for crossing the dreaded English channel, says the *Railway Age*, is embodied in a model now before the admiralty for a monster floating railway station, which is to carry trains across the channel at the rate of 14 knots an hour. It is stated that "each train would provide accommodations for 2,000 passengers," which we should say would make the largest train ever heard of—requiring 60 or more railway carriages.

SCIENTIFIC PROGRESS.

Lecture on Coal.

Professor T. Rupert Jones, F. R. S., has delivered a course of illustrated lectures at the Royal Institution on "Coal." He could not bring to the knowledge of his audience anything very new; all he contemplated was to present in one view the facts bearing on the subject so far as they had been ascertained by the latest scientific researches. He began by describing a lump of common household coal. It presented a seamy structure, composed of parallel plates. There was a bright, shiny face, contact with which did not soil the hands, as happened when we touched it in the transverse direction, where the surface was of a decidedly dull appearance. In trying to break the coal ignorant people were wont to strike it on the bright side and found the task troublesome, while the intelligent easily separated the plates by directing their blows to the dull surface. Of course the plates came asunder more readily in proportion as they became heated. Some kinds of coal were very brassy, being streaked with flakes of a metallic luster, often mixed with others of a white color. The latter were sulphate of lime, and the brassy-looking flakes were sulpburet of iron, commonly called iron pyrites. Other impurities in coal were noticed, such as "slates," which were rather of a clayey nature. No kind of coal was to be judged by its appearance only; the fiery trial was the sole true test. He showed specimens of bitumen from Trinidad, which, as was explained, has been greatly changed by contact with a lower stratum of volcanic coal. Having mentioned granulated coal, he described anthracite, a highly bituminized kind of coal, which was smokeless. Alhertite, rivaled anthracite in brightness and general appearance, but was of a different nature. For the purpose of determining of what coal consists, it was macerated for several weeks in a solution of caustic potash, after which it was found to be of a leathery consistency, the mass being in layers which might be lifted up one by one and were like layers of compressed bark or wood. Another process was boiling in nitric acid. The microscope revealed that the layers were really woody tissue, half-a-dozen forms of which, as found in coal thus treated, were shown by the lecturer on a diagram. Whole plants, with stems many feet long had been handed over to botanists and had been recognized as conifers, etc., of extinct species. Diagrams exhibited branches of these fossil trees, and drawings of *lycopodium* and *equisetum* were handed round among the audience, as well as others depicting *lepidostrobus* with its microspores and *Bowmanites* with its microspores. These spores, lesser and larger, played a great part in the history of coal, said the lecturer, as he held up a piece of coal picked out of a cellar that morning and presenting "lovely little bits of *lepidodendron*" marked distinctly upon it. How the pollen-showers from the conifers and the germs scattered by mosses and other cryptogams helped in the formation of coal was graphically illustrated by the analogy of the evergreen jungles in the Eastern Archipelago, with their luxuriant vegetation. All they knew bore out the definitions of coal given by Dr. Redfern and Professor Jukes. The former said that under that name "those substances must be comprised which consisted of compressed and chemically altered vegetable matter associated with more or less of earthy substances and capable of being used as fuel." Professor Jukes defined coal, geologically speaking, as "a stratified rock always found in beds inter-stratified with other rocks, such as clays, sandstones and occasionally limestone."

He proceeded to state the conditions under which coal is found in the earth, explaining that for the purpose of popular exposition it might be classified in about half-a-dozen groups. First came those containing a maximum of bitumen, or mineral pitch, many of which sorts were extensively used in the manufacture of gas. The albertite, found in large quantities in New Brunswick and sometimes met with in Scotland, belonged to this group. Next was a variety made up of vegetable spores, such as club-mosses and puff-balls, examples of which were the white coal of Tasmania and a variety of Bradford coal. Analogous to this was the true cannel coal, closely compacted of vegetable tissue. The common bituminous coal, which was used under many names as fuel in our parlors and kitchens, formed another group, to which might be subjoined the semi-bituminous kinds of coal, containing much charcoal. To the anthracite group belonged the best steam coals. They were smokeless, burnt with little flame, but developed heat very rapidly, converting water into steam in a minimum of time. Approaching the subject of the coal measures, the lecturer showed that all the geological formations connected with them contained stratified accumulations of organic remains, mostly vegetable, and often of great economic importance. The underlying beds represented the soil in which grew the forests afterwards fossilized into coal, and in these geological soils plenty of rootlets were accordingly met with. The shales, occurring in masses or laminated, were sometimes of a clayey nature, sometimes of decomposed granite, such as the London traffic ground out of our macadamized streets, or like the fresh soil now in process of natural formation by the weathering of the rocks on Dartmoor. The carbonaceous admixture in the shales was often turned to good account, mineral oils etc., being extracted from them. The materials of other coils were arenaceous or sandy, running into gritty, pebbly and conglomerate masses, often testifying to the action of water, mostly fresh. Sometimes the strata were calcareous, limestone being pretty frequent, with streaks of ironstone often containing the rarest fossils. The organic remains found in the ironstone were some of them marine, and others indicated a fresh-water formation. Some account was given of the geographical distribution of coal throughout the world, descriptions being illustrated by reference to specimens, diagrams and geological maps. The lecturer acknowledged that much had yet to be learned about the natural history of the coal measures, the order and extent of the special kinds of their animals and plants, the time occupied in their formation, and the geographical and hydrographical conditions.—*Colliery Guardian.*

Chemical Repulsion.—In a paper read on the 13th of January before the Royal Society, Dr. E. J. Mills claimed to have discovered a new order of chemical phenomena, which he has provisionally designated as "chemical repulsion." If a thin layer of a solution of chloride of barium be distributed evenly between two plates of glass placed horizontally (excess being removed by pressing the plates together), and then dilute sulphuric acid be brought into contact with it through a perforation made in the upper plate, precipitation takes place and continues progressively and uniformly from the perforation as a center; forming an increasing circle, for instance, if the perforation be circular. If the sulphuric acid be introduced through two perforations in the upper plate, two circles are formed, but as their circumferences approach each other development is retarded between the perforations, the figure of advance being no longer circular, but oval, and, however long the experiment may be continued, there always remains a line of demarkation of "no chemical action" between the two figures. When there are perforations at the four points of a square and one in the center, the center circle, having, as it develops, no way of escape from the surrounding four, eventually forms a square figure bounded by repulsion lines. Dr. Mills considers that the phenomena observed afford proof of two propositions: (1) That chemical action can take place at a distance; and (2) that two or more chemical actions, identical except in position, completely exclude one another.

Mexican Antiquities—Proposed Exploration.—It is announced that Mr. Lorillard, the great tobacconist of New York, has entered into an agreement with the French government to assist in a scheme for a thorough exploration among the ancient ruins of Mexico. Mr. Lorillard himself gives $20,000 at the start, and promises more when needed. M. Charnay, the French scientist and explorer, will have charge of the expedition, and his report will appear in the *North American Review;* but whatever relics are secured will go to Paris. This, however, will not be so very unfortunate for our own country, from the fact that there is a stringent law in Mexico which forbids the exportation of Mexican relics, so that only casts can be taken abroad, which may, of course, be duplicated for our own museums. The field to be explored is rich in relics, and the hope is that some key may be found by which the hieroglyphic language of those ancient races may be translated. This ancient people were undoubtedly great architects, possessing the power of moving immense masses of stone, and were quite lavish in their architectural ornamentations. It is altogether probable that M. Charnay may do much towards reaching a solution of the interesting questions of historic and prehistoric interest, which the explorations thus far, in these fields, have secured.

The Fracture of Cast Iron.—At a recent meeting of the Civil and Mechanical Engineer's Society, of London, the President read a very interesting paper, by Mr. James Love, on the above subject. In the paper the author went at considerable length into the matter, and described experiments on the peculiar form of fracture of cast iron, and showed its similarity to the fracture of other materials such as glass and sealing-wax. The author further showed by his experiments, these lines to be nearly at right angles to the lines of equal stress, demonstrated by the Astronomer-Royal some years back. Arguing from this stand-point, Mr. Love proved the viscosity of many materials and its connection with heat and regelation, which he has found in many substances including iron, and showed that the ordinary process of welding iron was due to regelation, and the cast iron could not be welded in consequence of the presence of carbon in the form of graphite. A short discussion ensued in which several gentlemen expressed that the facts (many of them original) demonstrated by the author were of sufficient importance to require a special evening devoted to their consideration, accordingly the discussion was adjourned.—*Engineering.*

M. Thollon has recently observed, by the aid of his spectroscope of high dispersive power, a solar protuberance whose hight equaled one-sixteenth of the diameter of the sun, or about 55,000 miles. It is only quite recently that observers have been able to witness such a phenomena at any other time than during a total eclipse—the protuberances being projected out and beyond the moon's disk, while it covered the sun.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 18		Week Ending Mar. 25		Week Ending Apr. 1.		Week Ending Apr. 8.	
Alpha	8½	7	8½	7½	7½	....	7	6½
Alta	3.55	3.35	4	3½	3.70	3.40	2.60	2½
Andes	65c	45c	70c	55c	80c	60c	90c	75c
Alps	....	....	....	....	....	....	....	....
Argenta	70c	65c	70c	65c	1.10	65c	65c	55c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	40c	25c	35c	30c	25c	....	....	....
Belcher	8½	5½	8	5½	4½	3.55	3½	2½
Belmont	20c	15c	30c	15c	20c	....	35c	15c
Best & Belcher	9½	8½	10½	10	10	9½	9½	8½
Bullion	4.80	4.35	5	4.40	3.90	3½	3½	2.70
Bechtel	2.05	2	2	1.85	1.80	2	2	1.2
Belle Isle	1½	1.10	1.20	1.05	1.20	1.05	1.05	60c
Bodie	8½	7⅞	7½	7½	11	9	9½	8½
Benton	2½	2	2.40	2.10	2.60	2.30	2.20	1.35
Bulwer	9½	9	9½	9	7½	7½	9½	7½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1	70c	80c	60c	90c	70c	80c	70c
Belvidere	3½	3½	3½	3.40	3	2.90	3½	2½
Booker	65c	60c	60c	55c	55c	50c	60c	50c
Caledonia	1½	1.05	1.40	1.05	1.10	1	1	80c
California	3.35	3½	3½	3.15	3.05	3	2½	2½
Challenge	1.55	1½	1½	1½	1.60	1½	1.55	1½
Chollar	6	5½	6½	6	5½	5½	5	5
Confidence	7½	6	7½	7	7	5½	6	5½
Con Imperial	55c	50c	55c	50c	50c	45c	45c	35c
Con Virginia	3.60	3.40	3.55	3.35	3.45	2.90	3.05	2.85
Crown Point	3.30	2.80	3½	2.95	3	2.60	2.45	1.80
Con Washoe	....	....	....	....	....	....	....	....
Champion	40c	35c	40c	30c	1.20	45c	1½	75c
Concordia	60c	40c	50c	....	1½	80c	1½	80c
Dayton	....	....	....	....	....	....	....	....
DeFree	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	55c	40c	1½	75c	80c	70c	90c	80c
Eureka Con	17½	14½	21½	18½	19½	19½	20¼	18½
Exchequer	3.10	2.85	3½	3	3	2½	2.60	2½
Endowment	15c	10c	10c	....	10c	5c	30c	25c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1.70	1.30	1½	1½	1.65	95c	1.40	90c
Gila	25c	....	....	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodshaw	40c	30c	40c	35c	45c	35c	40c	25c
Gould & Curry	5½	4.90	5½	5½	5½	4½	4½	4.10
Hale & Norrcss	5½	5½	6½	6	6	5½	5½	4.80
Hillside	1	75c	90c	75c	....	....	75c	60c
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	1.20	1	1	1.05	1	1	1	90c
Julia	1.15	1.05	1½	1.10	1.10	1	1.45	80c
Justice	1.80	1½	2	1.55	1.70	1.55	1.55	1½
Jackson	4	3½	4½	4	4½	3½	4	3
Joe Scates	....	....	....	....	....	....	....	....
K K Con	3½	3½	4	3½	4	3½	3½	3.35
Kentuck	3	3	3	....	3	....	3	2½
Kossuth	10c	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	40c	5c	45c	20c	....	....	20c	15c
Lady Wash	60c	....	80c	65c	65c	....	65c	50c
Leopard	10c	....	10c	....	....	....	10c	....
Leviathan	10c	....	40c	35c	35c	....	30c	30c
Leeds	60c	50c	50c	....	....	....	30c	....
Lee	....	....	....	....	....	....	....	....
May Belle	20c	....	25c	15c	25c	20c	25c	20c
Modoc	40c	....	....	....	....	....	....	....
Manhattan	1	90c	1	90c	85c	80c	1.05	1
Martin White	75c	....	80c	65c	35c	....	35c	25c
McClinton	80c	65c	80c	65c	85c	65c	80c	60c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	14½	13½	14½	14	14	13	13½	10
Midge	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	45c	35c	45c	35c	35c	27c	30c	15c
Northern Belle	18	15½	18½	17½	17½	15½	18	17½
New Coso	....	....	....	....	....	....	....	....
Navajo	35c	30c	35c	25c	35c	25c	35c	25c
Occidental	90c	70c	1.30	95c	1.40	1	1½	70c
Ophir	18½	17	18½	17½	17½	16½	15½	11½
Oriental	....	....	50c	....	....	....	50c	....
Overman	5½	1.95	2.60	2	2.05	1.80	2	1.10
Panther	....	....	....	....	....	....	....	....
Phenix	1	....	....	....	....	....	....	....
Phil Sheridan	....	....	10c	....	....	....	....	....
Potosi	4.30	4½	4.70	4.10	3.85	3½	3.85	2.90
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1	85c	85c	75c	75c	40c	50c	35c
Richer	....	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	30c	....	....	....	....	....	....	....
Seg Belcher	5½	5	5½	5½	5½	5.05	5	3.95
Sierra Nevada	18	14	15	14	....	....	....	....
Silver Hill	21½	20½	21½	20½	21½	19½	20	15½
Silver King	1	75c	1	80c	70c	60c	70c	55c
Silver Prize	7	6	5	5½	6	5½	5	....
Sucoor	....	....	....	....	....	....	....	....
Summit	1½	1.10	1.10	1	1.15	1	1½	1.10
Scorpion	3	2.80	3½	3	3	2.85	2.80	2½
Solid Silver	40c	20c	....	....	....	....	....	....
South Bodie	75c	60c	60c	55c	55c	50c	50c	40c
South Standard	25c	20c	25c	20c	25c	....	20c	15c
Star	25c	20c	25c	....	25c	....	25c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1.50	1.35	1½	1.40	1½	....	1.40	1
Tioga Con	2.70	2.30	2.50	2.40	2½	2½	2.30	2
Tiptop	4.30	4½	4½	4	....	....	4½	4
Trojan	....	....	....	....	....	10c	....	....
Union Con	37	35	38½	36½	38½	35½	33½	26
Utah	10½	9½	10½	9½	10	8½	10½	8½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.65	1½	1½	1.65	1½	....	1.55	1½
Wells-Fargo	....	....	5c	....	....	....	5c	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	8½	7½	8½	7½	8½	7½	7½	5½

Sales at S. F. Stock Exchange.

Friday A. M., Apr. 2.

200 Alta 3½@3.15
270 Andes 90@80c
60 Alpha 7@6½
330 Belcher 2.85@3.10
1010 Benton 2@2.25
640 Bullion 3½@3.45
110 Best & Belcher 9½@9¾
50 Chollar 5½
535 California 2½@2.65
160 O Dorado 1½
115 Challenge 1.55@1.60
175 Caledonia 95c@1
370 Con Imperial 45c
330 Crown Point 2.40@2.45
175 Con Virginia 2½@2.80
80 Exchequer 2.60
50 Essex 1.90
100 Flowery 10c
90 Gould & Curry 4½
200 Golden Gate 60c
90 Hale & Nor 5½
285 Justice 1½@1.45
750 Julia 85@80c
100 Leviathan 30c
480 Lady Wash 60@65c
380 Mexican 13½@13¾
50 Mackey 1.55
450 N Bonanza 20c
710 New York 25c
425 Occidental 1
180 Overman 1.90@2
430 Ophir 15½@16
150 Potosi 3.85
160 Savage 5
70 Scorpion 2.80@2½
300 Silver Hill 55@60c
400 Sierra Nevada 20@19½
120 Utah 8¾@8
840 Union Con 33¾@32½
400 Ward 1½
370 Yellow Jacket 7¼@7½

AFTERNOON SESSION.

600 Alta 5c
344 Addenda 80c
350 Alhion 55c
300 Argenta 65@60c
330 Wales 3
Saturday A. M., Apr. 3.
115 Aspna 6¾@6½
170 Alta 3.30@3.20
50 Andes 80c
400 Argenta 60c
1100 Alhion 55@50c
1000 Atlas 5c
425 Addenda 75@80c
140 Best & Belcher 9½
535 Bullion 3.30@3
500 Benton 2.05@2
135 Bodie 91@92
120 Belle Isle 1.05
750 Bechtel 1.95@2
95 Belvidere 3.10@3.20
510 Belcher 3@3.15
285 Bulwer 7@8
350 Booker 55@50c
350 Boston 1.20@1.15
55 Black Hawk 75c
55 Con Virginia 2.95
175 California 2.70
250 Con Imperial 45c
440 Chollar 5¾@5¾
285 Crown Point 2.40@2.45
330 Confidence 6
230 Caledonia 90@35c
220 Challenge 1.40
380 Con Edorado 1½@1.55
820 Champion 1.05@1.10
40 Caledonia (BH) 2
290 Concordia 85@80c
710 Day 85@90c
100 Grand Prize 1.10
720 Goodshaw 40@35c
50 E Norcross 1½@1.60
200 Holmes 1.20@1¼
350 Justice 1.45@1¾
835 Julia 1.35@1.30
100 Jackson 3½
590 Jupiter 2.60@2½
200 Kentuck 2½@2
400 Lady Wash 60c
200 L Bryan 15c
100 Leviathan 30c
200 Leeds 30c
270 Mexican 13½@13¾
170 Mackey 1.60
100 Mt Diablo 22
170 Manhattan 1
170 M White 25c
215 Mt Potosi 1.40
370 McClinton 75c@80c
290 Mammoth 2½@2.35
200 Navajo 25c
200 Northern Belle 17½@18
200 New York 25c
130 Mono 7
400 N Bonanza 25@20c
100 New York 25c
200 Northern Bello 17¾@17½
200 Navajo 25@20c
200 Noonday 4.80
220 N Noonday 4.30@4½
50 Occidental 1
215 Ophir 15½@15½
240 Overman 1½
120 Oriental 80c
430 Oro 41@4.30
220 Potosi 32
50 Paradise 30c
500 Queen Bee 45@40c
160 Raymond & Ely 60c
90 Real del Monte 2
100 Red Cloud 20c
50 Star 25c
50 Summit 1.20
1080 Sierra Nevada 19½@18½
20 Savage 5
250 S Standard 20@15c
150 Syndicate 1.40@1½
450 S Bulwer 80@75c
110 Silver Hill 65@60c
300 Scorpion 2.60@2½
50 Tioga Cou 2
275 Tiptop 4.30@4.40
245 Utah 10½@10¾
200 University 30c
710 Union Cou 32@31
390 Ward 1.60
220 Wales 3
250 Yellow Jacket 7½

Monday A. M., Apr. 5.

900 Alta 2½@2¾
500 Andes 85@75c
150 Alpha 6¾@6½
370 Belcher 3½@3.55
355 Benton 1.95@1.85
1190 Bullion 3.30@3½
50 Best & Belcher 8
130 California 2.55
745 Con Virginia 2.95@3
470 Chollar 5½@5¾
150 Con Imperial 45c
300 Crown Point 2.40@2.45
120 Confidence 54
125 Caledonia 80@85c
70 Challenge 1¼
75 Con Dorado 1.40
180 Exchequer 2.90
50 Essex 1.90
660 Flowery 10c
500 Golden Gate 50c
250 Gould & Curry 4.35@4.40
445 Hale & Nor 5@4.90
475 Julia 1.40@1.35
190 Justice 1.40@1.35
450 Leviathan 35@30c
150 Lady Wash 50@55c
700 Mackey 10c
355 Mexican 12@13¾
560 N Bonanza 20@25c
750 New York 30@25c
320 Ophir 15@14½
160 Overman 1.70@1.50
180 Occidental 1.10@1
350 Scorpion 3½@2.90
340 Silver Hill 60@55c
830 Savage 4.30
465 Sierra Nevada 17@18¾
140 Utah 9½@9
1140 Union Con 30½@29½
150 Ward 1.50
500 Wells-Fargo 5½
215 Yellow Jacket 7¼@7

AFTERNOON SESSION.

510 Addenda 85@95c
1235 Alhion 90c@1
1000 Atlas 5c
150 Black Hawk 75@80c
775 Booker 55@50c
260 Belvidere 3.20@3½
50 Belding 70c
675 Bodie 91@94
600 Bechtel 1.95
325 Belle Isle 95c@1
260 Bulwer 7¼@8
120 Boston 1.15@1.10
525 Caledonia (B H) 2
75 Challenge 90@75c
100 Concordia 1@1.10
40 O Pacific 2
200 D Standard 80c
300 Dudley 70c
350 Day 85@85c
195 Eureka Con 18½@19
70 E M Diablo 90c@1
300 Endowment 30c
470 Grand Prize 1.05@1.10
500 Gipsy Q 1
200 Goodshaw 25@30c
130 Hillside 75@70c
100 Jackson 3½
70 Jupiter 2
50 Mt Diablo 22
220 Metallic 1.80
35 M White 25c
110 Mono 5½
610 Mammoth 2.45@2½
400 McClinton 65@60c
50 Manhattan 1
70 Mt Potosi 1.70
70 Northern Belle 17½
130 Noonday 4½@4.60
245 N Noonday 5.70c
1370 N Belle Is 20@25c
1850 Navajo 35@25c
200 Orient 5c
150 Oro 1.4½
450 Paradise 50c
6 0 Queen Bee 40@45c
1020 Raymond & Ely 50@60c
100 Real del Monte 1½
190 Star 25c
500 Syndicate 1
245 Summit 1.10@1½
50 S Bodie 40c
300 S Bulwer 70c
100 Silver King 5
100 Tioga Con 2½
190 Tiptop 4.20@4½
180 Wales 3
Tuesday A. M., Apr. 6.
450 Alpa 6½
850 Andes 85@80c
415 Alta 2.90@3
500 Bullion 3.30@3.35
185 Best & Belcher 8½@9
765 Con Imperial 40@45c
145 Crown Point 2½@2.3a
60 Confidence 5½
465 Exchequer 2½@2.50
465 Essex 1.70
140 Caledonia 85@80c
150 Con Dorado 1.40
190 Chollar 5½@5¾
140 Con Virginia 3.05@3
150 Caledonia 85@80c
415 Alta 2.90@3
500 Bullion 3.30@3.35
185 Best & Belcher 8½@9
765 Con Imperial 40@45c
145 Crown Point 2½@2.3a
275 Beuton 1.85@2
465 California 2.55@2.70
605 Con Virginia 3.05@3
140 Caledonia 85@80c
150 Con Dorado 1.40
200 Gould & Curry 4½@5
325 Gould & Curry 4.35@4½
235 H & Norcross 4.80@4.85
750 Julia 1.35@1.30
200 Justice 1.40@1.35
200 Lady Wash 65@60c
300 Leviathan 30c
100 Lady Bryan 20c
50 Mackey 15c
100 Mexican 11½@12
190 Chollar 5½@5¾
765 Con Imperial 40@45c
145 Crown Point 2½@2.3a
50 Confidence 5½
465 Exchequer 2½@2.50
465 Essex 1.70
100 Flowery 10c
200 Golden Gate 50c
325 Gould & Curry 4.35@4½

300 Wells-Fargo	3c	20 Con Virginia	.3
20 Yellow Jacket	.71	260 Curtis	.55c
AFTERNOON SESSION.		60 Exchequer	.21@2.45
125 Alta	.24@2.70	200 Goodshaw	.77c
100 Black Hiller	.22½	30 Hale & Nor	.56@4.95
40 Belcher	.2.90@2	210 Justice	.1.45@1
145 Best & Belcher	.9.@9	75 Julia	.1.45
85 Bullion	.2.95@3	50 Lady Wash	.90c
150 Bodie Q	.50@55c	210 N Sierra Nevada	.4c
20 Crown Point	.2.10@2.15	10 Ophir	.1¾
100 Con Imperial	.40c	100 Silver Hill	.60c
15 California	.2.80	350 Wells-Fargo	.2.95c

Pacific Board—Latest Sales.

Wed'sday A. M., Apr. 7.		150 S Nevada	.15@16
100 Alta	.3	140 Union Con	.30@29
80 Alpha	.7	80 Utah	.10
230 Belcher	.3.20@3	360 Yellow Jacket	.7@7½
250 Bullion	.3.15	AFTERNOON SESSION.	
260 Best & Belcher	.9@9	120 Alpha	.6¾
100 Benton	.1.90	200 Andes	.80c
125 California	.2	100 Albion	.75c
160 Con Virginia	.2.30	50 Belvidere	.2.80
280 Crown Point	.2.35@2	50 Belcher	.2.90
100 Champion	.85c	40 Crown Point	.2.20
125 Chollar	.5@05	140 California	.2.85
250 Exchequer	.2.60@2.55	25 Exchequer	.2.15
550 Gould & Curry	.4@4.35	100 Flowery	.15c
110 Hale & Nor	.5	420 Gould & Curry	.4.10@1.05
270 Julia	.1.35@1.45	200 Julia	.1.35@1
245 Justice	.11	150 Mackey	.10c
70 Lady Wash	.60@75c	10 Mexican	.11
130 Mexican	.12½@12	100 Ophir	.12
125 N Noonday	.4.10	100 Silver Hill	.60c
135 Overman	.15	20 Savage	.4.10
270 Ophir	.14@14	20 Utah	.9
70 Savage	.4.30	110 Union	.28

Mining Share Market.

There is no stability in the stock market. Those who possess money will not invest, and those who have not got it cannot obtain stock upon entire credit. Attempts are made continually to produce a "boom," but there is not power, force or vitality enough to move tho now inert mass of heretofore vivacious speculation, and the intended advance results in a general retrograde line of prices. As times grew dull some long time ago, the manipulators began to quarrel among themselves, and in the excitement of their disputes told some plain truths, which they corroborated by potent facts, the which, tho outsiders are ungenerous enough to retain in their memories. There was too much divulged in these squabbles to allow of the people being gulled afterwards as they have been previously; and no matter how temptingly the bait is displayed the old rats who have learned wisdom by experience cannot be induced to nibble at it, and so fall into the trap.

The tendency of prices has been continuously downward for many weeks; the investments have been, outside of stock operations, into paying and creditable mines. Capital is seeking good mines, not for the uncertainty of stock transactions, but for true and legitimate mining.

Assessments are far more numerous than dividends in speculative mines, and to those who need money such a status is not attractive. The operators attribute the dullness to various causes—all of them far from the right ones. They invent so many statements to cover their defeat from time to time that it would be ludicrous, were it not so humiliating to contemplate. They now attribute the present still further drop down, to the breaking of the pump hohs in the Union shaft. It is true that this accident is a set back to this particular mine, and perhaps also to some contiguous properties. But those pump bohs did not move for the entire line of mines whose stock is listed upon the boards. Important as they were to the mine in question, they could not affect the mining welfare to a sufficient extent to depress the prices on the entire list. The true cause of the depression in stocks in this market is that the people have lost all confidence in the manipulators fair dealing.

If the New York markets are not managed on a different principle from those in this city, the miuing stock husiness there will meet with a speedy downfall.

Bullion Shipments.*

Since our last issue, we have noticed the following hullion shipments :

Golden Terra (B. H.), Mar. 17, $17,000; Northern Belle, Mar. 29, $8,435.04; Mar. 31, $8,707.74; Bodie Con., Mar. 29; $6,424; Christy, Mar. 29th, $2,029.26; Apr. 1, $7,771; Apr. 2, $3,402.75; McCormick & Co., Mar. 27, $5,560; Mar. 29, $6,040; Mar. 30, $17,920; Apr. 1, $8,760; Mar. 31, 5,430; Apr. 2, $8,240; Horn Silver, Mar. 30, $4,268.16; Apr. 1, 24,277 lbs.; Tombstone, Apr. 2, $14,600; Ivanpah, Apr. 4, $7,030; Wells, Fargo & Co., at Eureka, Mar. 31, $1,200; Richmond, Mar. 30, $17,418.43; Apr. 3, $24,173.05; Alexander, Mar. 15 to 26, inclusive, $14,874.98; Con. Virginia, Apr. 3, $68,039.31; California, Apr. 3, $73,065.43; Idaho, for March, $39,000; Barbee & Walker, Apr. 2, $5,396.73; Bremen's, Mar. 31, $5,255.

*Desiring to make our list of Bullion Shipments as complete as possible, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

GEN. GRANT was invested with the title of Duke of America hy the Carnival Court at New Orleans a few days since.

RUFUS MORGAN died in Bernardo, San Diego county, a few days since, from the effects of eating poisonous mushrooms,

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

CAVE AT THE ZEILE.—*Dispatch*, April 3: A frightful cave occurred at the Zeile mine in the 240 level, which crushed in the old timbers like matches, and came near resulting in one of the most horrible calamities ever witnessed in the county. There were 15 miners at work in the tunnel at the time, but the alarm was given in time for all of them to make their escape except one man, named Nicola Noce, who happened to be in the back part of the tunnel. It was at first thought that he had been crushed to death under the falling mass of dirt, and all hands immediately went to work to dig him out. In the course of a few hours they discovered that he was still alive and unhurt, and succeeded in rescuing him from his underground prison.

MARBLE QUARRIES NEAR OLETA.—*Ledger*, April 3: The quarries are in active operation, and they are taking out some excellent quality of marble. It is of solid texture, and is being manufactured into monuments, tombstones, statues and every description of marble work. They have been in operation since last October. The work will be greatly enlarged during the coming season.

BUTTE.

MEREDITH.—Oroville *Mercury*, April 2: The ledge is 8 ft thick at the point discovered, running north and south and dips into the hill toward the main lode. The tunnel passed through the 8-ft solid vein, but for 20 ft (the distance in) it encounters talc-slate and similar substances, studded with quartz and quartz veins, rich in gold. The main lead is 200 ft distant and crops out boldly.

MAMMOTH BUTTE NO. 1.—The assay set forth that each ton of rock contained gold to the value of $72.34 and $12.90 silver.

BANNER.—*Register*, April 2: After being idle on account of the cave which took place 20 years back, was started up, thoroughly opened and a fine new mill built by San Francisco parties, some 4 months ago, and the first run of 5 days' work yielded $3,000, with prospects ahead as bright as ever shown upon a mining operation, when owing to one of those unfortunate misunderstandings among partners, which so often mar the brightest business prospects, took place and the mill was closed down, in which condition it remained until about 2 weeks since, when it was set on fire and burned to ground. A new mill is to be erected at once.

MONO.

BOSTON CON.—*Chronicle*, Mar. 31: The main incline shaft has reached a depth of 78 ft below the 200-ft station, a progress for the week of 14 ft. The bottom of the shaft is now in harder ground and of the same favorable character referred to in last report. The north drift has been driven 101 ft north from the station. Three samples of ore taken from this drift gave the following results: No. 1, gold, $27.50; silver, $4.75; total, $32.25. No. 2, gold, $30.13; silver, $3.14; total, $33.27. No. 3, gold, $42.61; silver, $125.03; total, $168.29. Samples 1 and 2 were taken from the middle and eastern portion of the vein, and No. 3 from the west side.

BLACKHAWK.—The shaft is down to the 700 level, with a 6-ft sump below. The station is in on both sides of the drift, and drifting has commenced to the east and to the west, and will be sent ahead as lively as possible.

MARYLAND CON.—The shaft is down 550 ft, from which station crosscutting has been going forward with favorable results. The crosscuts are in about 80 ft each way. This claim is now looking very promising, and the work is being pushed with energy.

SOUTH STANDARD.—For the past two days there has been an improvement in appearance of material passed through, being largely composed of clay and quartz of very favorable character, pitching to the west. Everything is working well.

NOONDAY.—*Free Press*, Mar. 31: The east crosscut, 500 level, is in 325 ft. On the 412 level the drift on vein No. 1, north, is in from the east crosscut 118 ft. Drift on the same vein south is in 123 ft. North drift on vein No. 2 is in from crosscut 93 ft. South drift, same vein, is in from crosscut 84 ft. They are now milling ore from this level. On the 220 level the stopes look better than ever, and are shipping ore from this level to the mill. The connection by the winze, from the 312 level to the 412 level, is completed, and gives fine ventilation to the 412 level. The stopes at the 200 level are opening up well.

SOUTH BULWER.—The main double-compartment shaft has been sunk 6 ft below the 550 level. The east crosscut, on the 550 level, has passed through hard porphyry mixed with seams of quartz and clay, and the appearances are very favorable for shortly cutting the vein. The west crosscut, 500 level, is in 31 ft.

BELVIDERE.—The main shaft is 35 ft below the 400-ft station. The east wall of the ledge carries 2 ft of bright, lively quartz. Assays from this portion of the vein range from $15 to $20 per ton. They have the west wall of the ledge, in the west end of the shaft, carrying 2 ft of quartz of the same value as that on the east wall. Between these 2 bodies of quartz there are 3 ft of irregular seams of quartz and porphyry, giving 7 ft between the walls.

BONE BLUFF CON.—During the past week an improvement has occurred in the ledge, both in size and character of rock. It continues the same uniform regularity in the incline, and has increased in width since last report 2 inches.

STANDARD CON.—The east crosscut, 500 level, is in from the shaft 220 ft. A crosscut was started west from the end of the north drift 500 level. It is in 20 ft. The east crosscut from the south drift, 385 level, is in 33 ft. Upraise No. 2 from the south drift has reached a hight of 104 ft. The ledge is 6 ft wide, of very rich ore. The upraise from the north drift is up 115 ft. The ledge is 4 ft wide, of good milling ore. The north drift on the east ledge, 300 level, incline, is in 232 ft. The ledge is 3 ft wide. The south drift from the west crosscut is in 200 ft. The ledge is 5 ft wide. The north drift, 550 level, is in from the winze 132 ft. In the north drift, 335 level, they are now taking out very fine ore. The ledge in the West Standard stopes is 5 ft wide. In the Gildea stopes the vein is 4 ft wide, of good ore.

HOMER.—The tunnel on the Crevasse vein is in 101 ft. The vein averages 2½ ft in thickness and $30 per ton. A drift has been started on the Seneca vein and run 0 ft. The vein holds a width of 2½ ft, and will mill from $70 to $75 per ton.

TIOGA CON.—The station at the 500 level is completed, receiving tank put in place, and shaft sunk and timbered 14 ft below the station. Crosscutting from the 300 level, both east and west, has been commenced. The east crosscut is in 9 ft, and the west 16 ft.

SUMMIT.—The north drift, 530 level, is in from the shaft 177 ft. The ledge is 2 ft wide.

ADDENDA.—The shaft is 324 ft in depth; the bottom in vein matter carrying bright, lively quartz and seams of mineral-bearing clay. The indications are good for soon cutting the rich ledge opened in the old workings.

CON. PACIFIC.—*News*, Mar. 31: The shaft is a fine double compartment one, and has a depth of 500 ft. At the 400 level a station has been opened and drifts started north and south. The north drift has been run 00 ft, at which point it deflected to the east and has been driven a distance of 130 ft, crosscutting the country, making a total distance of 100 ft. At 140 ft a vein of bright, lively quartz 2 ft thick has been cut, a large part of which is good milling ore. The crosscut extends 30 ft, cutting a vein 2½ ft wide of low-grade ore. A drift was started and is now following the vein north. The quality of the ore is improving as advance is made. This drift is now in the ore body 20 ft, showing a ledge the full width of the drift, carrying fair milling ore. The south drift on the 400 station is in 183 ft.

SOUTH NOONDAY.—The north drift on the 150 level has a total length of 53 ft. The ledge in this drift is 6 ft wide of good ore. The south drift on the same level has a total length of 45 ft. The ledge in this drift is 4 ft wide, of good ore. They are raising 4 tons daily.

BULWER CON.—The north drift is in from the tunnel 135 ft. The ledge is 2½ ft wide and looks well. The south drift is in 131 ft. The ledge in the Stonewall stopes is 2 ft wide, of very good ore. In the stope on the Ralston the ledge is 3½ ft wide, and looks well.

DOUBLE STANDARD. The north drift is in from the crosscut 25 ft. The ledge is 3½ ft wide, and looks well. The winze is down 35 ft. The ledge in the bottom is 3 ft wide, of good ore.

QUEEN BEE. The north drift on the 400 level is in 558 ft. The ledge is looking well, carrying good ore and holding out in width. The east crosscut, same level, is in 57 ft.

BENTON ITEMS.—Con. Ogg arrived yesterday, via Benton, where he remained for 12 days, prospecting the district. He located 3 mines, the New Mexico, the Colorado (an extension of the New Mexico) and the South America, 3 miles south of the New Mexico. The latter is on old location running back to 1864, at which time a tunnel 65 ft long, and another 75 ft long, was run on the ledge, and in each of the tunnels a winze 50 ft deep was sunk in the ledge, the ore assaying, on an average, $300 to the ton. The ledge shows clear-cut and well-defined walls that can be distinctly traced for 3,000 ft. The Diana mine is now 800 ft deep, with a 6-ft ledge that will average $1,000 per ton. They are working the mine with a whim.

NEVADA.

BIG BLUFF.—*Transcript*, April 2: An assay of the ore yielded $614.93 in gold and $4 in silver per tou; a second piece of quartz from another part of the claim paid $128.61.

MOHICAN.—The last crushing of ore consisted of 87 tons, and paid an average of $20 a ton. The pump gearing invented by John Reseigh, Superintendent of the mine, has for 2 or 3 days been in operation, and is a success. It is worked by a one-horse power, and raises from 8 to 10 gallons of water a minute a distance of 120 feet. It is comparatively inexpensive, costing only $100.

STRIKE ON GOLD FLAT.—The croppings of a small ledge were found, 300 ft east of the old Mohawk hoisting works, at a depth of 25 feet, the ledge widening to 8 inches. It is now well defined, and it will pay an average of $75 a ton.

EUREKA, No. 2.—This mine is worked through a tunnel 400 ft in length, that gives 120 ft backs on a ledge varying from 8 to 24 inches in thickness. The ore mills an average of over $8 a ton, some of it paying $20. The formation is uniform in size and richness. It is opened sufficiently to enable 12 tons to be produced a day regularly.

TUOLUMNE.

BONANZA.—Sonora *Independent*, April 3: About 0 months ago the company extracted from a pocket, with a few days' labor, something near $175,000, and gross yield for that month was rising $300,000. The total yield of the mine since its discovery reaches a half million dollars. This is a pocket vein and in a pocket locality.

DAVIS & ROBBINS.—This mine adjoins the Bonanza, and is being prospected systematically. The shaft is down 100 ft. A portable 2-horse power engine furnishes power for hoisting ore and waste material.

GIGANTIC SULPHURET.—The course of the lead is northerly, and from 400 ft to 000 ft in width, and has been traced on the surface over 1 mile. This lode or ledge differs materially in its character from any known metallic vein in the county. The vein matter is of talcose nature, having a whitish color, and the sulphurets are charged with gold.

GOLDEN GATE.—Has been successfully worked since the mill, which has been kept in continuous operation, was erected a number of years ago. The ore carries a large percentage of gold-bearing sulphurets. The concentrated sulphurets are shipped to San Francisco to be treated. This is one of the best mines in the county at present being worked, among the milling veins.

ITEM.—One night (about 1 o'clock) the present week, a gentleman who resides in the upper part of town was attracted to the front of his dwelling by the furious barking of his watch-dog. On going to the sidewalk he encountered a young man with whom he was acquainted, carrying his hat under his arm, "nearly full of gold specimens." "Now that you have caught me," said he, "I will show you a small portion of *my* big bonanza." He said "*that* wasn't a circumstance," that "he had two barrels full of gold specimens buried, like the ones in his hat," and that "there was any quantity more of the same sort in the vein, which he had not taken out." After instructing him to keep his name a profound secret, he requested him to pick out a good piece, and then went on his way. The claim is within the city limits, but in what particular locality we are unable to state.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—Gold Hill *News*, April 7: The east crosscut, 2300 level, 600 ft north of the east shaft and opposite the main shaft, has been discontinued; its face is 30 ft east of the main north drift. The presence of water in that part of the ledge is feared. The crosscut west has been discontinued on the same account, and a drill will be sent ahead to guard against water. The north drift on this level is in a very fine quartz formation. The winze from the 2400 level, 145 ft north of the incline, is being continued down.

OPHIR.—Winze No. 2 from the 2100 level is down 42 ft. The north drift on the 2200 level is in from the main southeast drift 265 ft. Crosscut No. 1 east on this level is in 130 ft. On the 2300 level the chamber in the joint Mexican east crosscut has been completed, and the winze for the 2500 level started. The crosscut is in 280 ft. The main north drift on the 2500 level is in from the incline 345 ft. The east drift on this level is in from the incline 280 ft.

BELCHER.—The south drift along the ore vein is 115 ft from the east crosscut, and continues in an excellent vein material. On the 3000 level the south drift is being continued. The east crosscut on this level was pushed 80 ft into a fine vein formation carrying bunches of good quartz, and a diamond drill was then sent in 40 ft and tapped the hot water, which flooded the level and stopped work. Tbis water has been pumped out.

SILVER HILL.—The crosscut east ou the 1300 level is in 1,475 ft. The lateral drift south on this level is cutting ledge matter, and evidently nearing the quartz vein encountered in the crosscut 1,000 ft east of the incline; total length, 155 ft.

UTAH.—Total depth of the incline, 54 ft below the 1050 level. Sinking has been discontinued to place a tank under the 1050 station. On the 1750 level a crosscut has been started east from a polut in the south drift 300 ft from the incline.

CON. IMPERIAL.—Running north on the 2800 level through a mixture of quartz and porphyry; total length of this drift, 320 ft. Sinking a sump below the 2800 level on the Alpha line, preparatory to opeuing out the station and drifting south to meet the north drift on that level.

LADY WASHINGTON.—West crosscut No. 3, 1550 level, has been run 133 ft, having passed entirely through the vein and 4 ft into the west wall, where it was discontinued. Some fine quartz has been encountered but no pay ore.

UNION CON.—An accident occurred about midnight on the 1st inst., when every balance bob in the shaft broke. These bobs are placed at the 250, 000, 1100, 1500, 1700 and 1900 levels. They are of cast iron and calculated to carry each 20 to 40 tons of ballast to balance the rods of the pumps. They were each carrying on an average about 30 tons. The breaking of the balance bobs threw all the weight of the rods and attachments upon the engine, which was not less than 180 tons. The accident will cause a delay of 3 or 4 weeks in starting the pumps, and will also interfere with the use of the shaft for the work to which is was about to be put. Winze No. 1 from the 2400 level will this week reach the 2500 level, and will be continued on down for a sump before workings on that level are commenced. The southeast drift, 2400 level, is in from the Union shaft 445 ft.

OVERMAN.—Crosscut No. 2 east is being continued through vein porphyry; total length, 350 ft. The raise from the 700 level is in softer vein matter carrying streaks of quartz; total length, 50 ft.

CALIFORNIA.—West crosscut on the 1500 level is in 195 ft. The raise from the 2100 level is up 45 ft, and in quartz giving low assays. Daily yield 70 tons of ore.

NORTH BONANZA.—The winze from the 400 level in the ore body shows a slight improvement in the quality of the ore. An effort is to be made to use a concentrator and work this ore. Assays made from concentrations give $86 per ton.

CON. VIRGINIA.—The stopes continue their accustomed yield of 175 tons of ore per day, which comes from the 1550 and 1750 levels. The joint California crosscut east on the 2200 level is in 242 ft.

YELLOW JACKET.—The crosscut west, 2700 level, has been discontinued; its face is 273 ft from the south lateral drift. The shaft is being continued down, and is nearing the 2900 level.

SUTRO TUNNEL.—The north header is now 2,000 ft from the main tunnel and less than 200 ft from the connection with the drift west from the O & O shaft. The necessary repairs to the south lateral branch have proved to be more extensive than was at first supposed, and work in the south header has not yet been commenced.

BULLION.—The east drift on the 2350 level is in good ledge matter; total length, 40 ft. The incline winze below this level is also in fine ledge matter; total depth, 30 ft.

BELMONT DISTRICT.

BELMONT.—*Courier*, Mar. 27: The pay streak of ore in the 300 level drift has greatly improved, with prospects of a large body of high-grade ore. Connection with the north end of the mine through this drift will allow of taking ore out at small cost. As soon as they make this connection they will have plenty of air, thereby enabling them to continue the upraise without delay. The crosscut running west from the 300 level is in 74 ft.

BALCOMBE.—Have started a level south, on Cinnabar ledge, 1,065 ft from the mouth of the tunnel. The ledge is 4 ft wide, sulphuret ore, assaying $147.63 per ton in silver. They are in on the ledge 5 ft, and have struck a body of black metal and cinnabar ore. Chloride strikes from the level in the north incline assay, from stope, $332.72.

SAN ANTONIO.—The main 450 level is in 36 ft. The vein improves in character every day.

JETT CON.—The Centennial shaft is down 100 ft. They are now opening the No. 1 station, preparatory to running the east and west levels, as well as the sinking of the 2d 100 ft. The Idlewild tunnel is in 120 ft.

EUREKA DISTRICT.

EUREKA CON.—*Sentinel*, April 3: Second level—North drift in 136 ft. Seventh level—North drift in 134 ft; northeast drift in 237 ft. Eighth level—Southeast drift in 300 ft. Ninth level—Southeast drift in 110 ft; north Burleigh in 66 ft; upraise No. 1 in 34 ft; upraise No. 2 in 13 ft. Tenth level—East drift in 294 ft. Eleventh level—North drift in 177 ft.

GRUBER & BERTRAND.—A few days since the workmen cut into a body of ore at the bottom of the 300 level. It is said to carry the richest ore ever found in this remarkably rich mine. The gangue is in the nature of iron profusely stratified with seams. Running through all of these seams are flakes or ribbons of pure horn silver. The discovery is something out of the line of the finds hitherto made in this section. Horn silver has never been characteristic of the ores of this district.

SAN JOSE.—The late discovery is proving to be one of the most valuable ever disclosed in this district. The ore body has been penetrated a distance of 17 ft, and the bonanza found to be widening both to the right and to the left. The dimensions are yet undetermined. Assays run from $195 to $287 per ton. Choice pieces of ore are frequently encountered so impregnated with free gold as to render the precious particles visible to the naked eye. These specimens would no doubt assay away up into the thousands, but the tests thus far have been confined to average samples.

ALBION.—The Albion strike seems to get better and better. The accounts of the recent development were substantially correct, including the assays of $120 and $187 to the ton. The strike was made at the head of the main drift, 335 level, near the Tiptop, and on the Albion side of it. The dip of the ore is to the northwest, which will throw it still farther on Albion ground at greater depth.

PHIL SHERIDAN.—The mine has a vertical shaft of 45 ft; thence southerly a drift that runs through a small body of low-grade carbonate ore at its terminus, showing rich ledge matter. The main incline is down 125 ft, all the way through strata of oxide of manganese and carbonate ore.

COLORADO.—There has been considerable work done on the mine and some $10,000 worth of ore bas been extracted. The ore averages between $60 and $70 per ton. There is also a large amount of ore in the mine that will assay $50 per ton.

ORIENTAL & BELMONT.—This property comprises a strip of mineral territory on the great lode leading down from Ruby hill, 1,500 ft in length by 450 ft in widtb. The deepest working is a perpendicular shaft of 185 ft. There are several other shafts, cuts, excavations, etc., on different portions of the property.

RAGINE.—This is a claim 1,200 ft long by 200 ft wide. It yielded largely in its early history.

BOWMAN.—This mine is in the hands of an Eastern company and is situated well up towards Ruby hill.

SILVER LICK.—This mine is a well-known bullion producer. It is acknowledged to be one of the very best mines in any part of Eureka district. It is being worked and is yielding handsomely.

I. X. L. DISTRICT.

ITEMS.—Eureka *Sentinel*, Mar. 31: The Bayfield has sunk 3 shafts during the winter. The deepest is down 70 ft. An important strike has been made in it. Another shaft, 25 ft deep, has 12 ft of good ore, which assays $232.48 per ton. John T. lately struck a streak of galena on the west side of the mountain which assayed $700 per ton

PYRAMID DISTRICT.

JONES & KINKEAD.—Reno *Gazette*, Mar. 23: On the 400 level, where the rich strike has been made, there have been two crosscuts run. The one at the shaft shows the vein to be 11 ft wide; the other, 00 ft from the shaft, is 40 ft wide, and the walls spread as they go north. A drift was started north from the shaft, and after cutting through 14 ft of ore going from $8 to $50, the drift cut into a heavy black ore.

WINNEMUCCA DISTRICT.

BULLION BEE.—*Silver State*, April 3: A sample of ore from this mine assayed $104.08 in silver to the ton. The ledge, of which the assayed sample is a good average, is from 10 to 20 ft wide.

ARIZONA.

BREMEN'S '76.—*Silver Belt*, Mar. 31: Is delivering 13 tons to the mill daily, the average yield of which is $80 per ton, while in the office there are 10 tons that is principally sulphides with some chlorides and chloro-bromides. Among the lot there are large masses of silver glance that assays from $22,000 to $27,000 per ton, while the whole lot is estimated to be worth over $50,000.

LEGAL TENDER.—They are piling up large quantities of ore, ready for reduction when the mill starts, which has a capacity of 15 tons.

GLOBE DISTRICT ITEMS.—At the Lexington they have several tons of good ore on the dump. A fine body of ore has been struck in a drift started west from the bottom of the Independence shaft, 120 ft in depth. The same character of ore is coming in the faces of the east drift on the same level. The Queen shows a vein varying in width from 2 to 4 ft, at the depth of 70 ft. Two smaller veins on each side, apparently dipping towards the shaft ledge, carrying rich ore, and from 6 to 12 inches in width. The Dundee shows 25 tons of rich chloride ore on dump, with an immense amount of the same in sight. Rich ore is being taken from the blanket lead. The shaft is down 45 ft. Work on the Mack Morris is being pushed forward. The

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Origin of Lakes.*

[By Prof. John Le Conte.]

The most casual glance at a map of the world reveals the fact that lakes are not uniformly distributed over the continents of the earth. They are far more numerous in the high northern latitudes of Asia, Europe and North America than in the regione hordering the eqnator and in the southern continents. The most notable exceptions to this law of lake distrihution occur in certain great plateau lakes in the torrid zone, and particularly those of equatorial Africa.

Nevertheless, the general fact that there ie a marked inequality in the distrihution of lacustrine hasins, which seems to be related to *latitude*, is significant, and may have an important hearing on the *theory of the origin of a certain class of lakes.*

Origin of Lakes in General.

Lakee occupy greater or less depressions in the eurface of the earth, which, from the configuration of the surrounding land, are not drained hy etreams, nor kept dry hy evaporation incident to climatic conditions.

The freshness or saltness of the waters which occupy these hollows depends mainly upon the circumstance whether the lakes are accompanied by *outlets* or not. In the former case they are usually fresh; in the latter case they are (unless of comparatively recent origin) generally salt; for, it is evident, as the saline matters brought in by affluent waters, must, in the absence of an outlet, accumulate in the hesin, it ie simply a question of time when the waters will hecome snccessively hrackish and salt.

It is obvious that euch depressione in the surface of the earth as constitute *lake basins*, may owe their origin to a variety of circumstances. Among these the following may be enumerated:

I.—Portions of Old Seas.

The remnants of an ancient ocean left in the depressions of ite bed as the waters retired when the continents were elevated above its surface, might give origin to lakes of all degrees of magnitude. Such remnants of old seas might hecome freshened when outlets were estahlished, and, on the contrary, when no outlets existed, their ealtness might progressively augment by the concentration of saline matters brought by affluent streams.

The so-called Caspian and Aral seas in Asia are supposed to have heen at some remote epoch portions of the Black sea. The surface of the water in the former is more than 80 feet helow the level of the adjacent ocean; and, as it has no outlet, it seems probahle that evaporation has concentratod its watere, and thus depressed their surface far helow the original level.

II.—Plateau Lakes.

Lakes in elevated plains or plateaus, heing eimple depressions in a nearly uniform surface, are likewise generally of considerable size, hut relatively of no great depth. To this class helong the equatorial lakes of Africa and the Great Salt Lake in Utah.

III.—Crater Lakes.

In volcanic regions the craters of extinct volcanoes eometimes constitute deep circular or elliptical basins, which serve as reservoirs for the meteoric waters that flow into them. Such lakes are comparatively small.

In the volcanic regions of the lower Rhine and the Eisel, between Coblentz and Boun, crater lakes are found in the miocene. Among these may be mentioned Gemunder Maar, Weinfelder Maar, Schaalkenmehren Maar, Pulver Maar, Meerfelder Maar and Laach. Many similar small lakes are to be found in the volcanic districts of other portions of Europe.

IV.—Earthquake Lakes.

Local subsidences have eometimes resulted from earthquakes, and thus given origin to lacustrine basins of greater or less dimensions. It is eaid that in the year 280 B. C., the large fresh-water lake of Oitz, in Japan, was formed in one night hy a prodigious subsidence of the ground.

But we have more recent and authentic examples of the formation of lakes hy this cause. It is well known that dnring the earthquakes which agitated the southern and western portions of the United States in the year 1811, an extensive area of gronnd in the valley of the Mississippi, near New Madrid, in Missouri, eubsided many feet, and thus gave origin to a lake.

V.—Accidental Lakes.

Extensive landslides, and eometimes lava currents, have heen known to dam up the beds of rivers, and thus form lakes of greater or less eize. The fall of the side of a mountain is said to have formed the Oschenen-See, in the canton of Berne in Switzerland. And the Lake of Aidat, near Clermont, Province of Auvergne, in Frence, seems to have heen formed by the lava of the Puy de la Vache damming up the river Sioule.

VI.—Lime-Sink Lakes.

In many limestone districts subterranean etreams undermine considerahle areas of ground, thus forming more or less extensive caverns or caves. By the falling in of the roofs of snch calcareous caverns, the well-known local depressions, designated lime sinks, are produced, forming reservoirs of greatsr or less extent, constituting fresh-water lakes or ponds. The heautiful miniature lakes which dot the surface of some portions of Florida, nndonhtedly owe their origin to this cause.

Glacial Origin of Lakes.

It is evident that the origin of a large number of lakes cannot, with any reasonahle show of prohahility, he referred to any of the causce ahove enumerated.

The vast number of lakes of varions sizes which dot the surfacee of the northern portions of the continents of Europe, Asia and North America, when taken in connection with their comparative ahsence in inter-tropical regions, very naturally led to the supposition that their origin might, in eome manner, he connected with glacial agencies.

This view seemed to he fortified hy the fact that, throughont most of the regions in which thie profusiou of lakes occurs, there are indnhitahle evidences of almost nniversal glaciation of the country.

Nevertheless, Central Asia seems to furnish a notable exception to thie association of lake hasins with glacial action; for, according to Raphael Pumpelly, there are "no traces of glaciation in Central Asia, outside of the high mountain chains."

The mode in which glaciers might have given origin to lakes, may be included nnder two distinct heads:

a—Moraine Lakes.

In all glacier countries, past or present, we frequently find lake basins that are evidently produced hy the damming up of a valley hy a perfectly symmetrical moraine, composed of houlders, fragments of rocks, gravel and sand. The beautiful circular lake in Switzerland, called the Feldsee, undonhtedly owes ite origin to this cause.

Several lakes on the Italian eide of the Alps, below Ivrea, and also among the monntains of Wales, have a eimilar origin. Numerous small mountain lakes in the Sierra Nevadas, as, for instance, Donner lake, obviously owe their origin to the same cause.

b.—Glacier-scooped Lakes.

In the year 1862, Mr. A. C. Ramsay, of England, promulgated the theory that a large portion of the lacuetrine hasins occurring in northern latitudes, and especially those fonnd in mountain valleys, owe their origin to the *scooping action of ancient glaciers on the softer rocks beneath.* In other worde, that ench lakee owe their origin to real glacier-scooped rock hasins. He ehows that in the great Alpine lakes there are no evidences of local depressione; on the contrary, the strata are cut ont hy some eroding agency.

Cavities of large dimensions containing water in mountainous regions may he said to he almost universally in the *course of valleys of erosion.* It is also evident "that the materials which once filled these hasins h ve been gradnally removed, so that older formations are now exposed to view at the hottom."

The only question is, therefore, whether the dennding force was moving ice or running water—a glacier or a river. Mr. Rameey maintains that *the action of water is incapable of excavating such basins, but that glaciers of enormous thickness and proportionate weight, would scoop out basins of the character containing these lakes.* No doubt Mr. Ramsay is perfectly right in insisting that it is highly unreasonahle to suppose "that these lakes lie in *areas of special depression*, made by the einking of the land underneath each lake." For, in some regions, the lakes are eo nnmerous and eo near to each other that the thcory of a particular depression for each one becomes untenahle. In the Alps, North Wales, Cnmherland, and the Highlands of Scotland they occur by the hnndred, and in the northern part of North America they occur by the thousand, "as if the whole country were eown broadcast with lakes, large and small;" eo that "it becomee an ahsurdity to suppose that, eo close together, *a special area of depression was provided for each lake.*"

But Mr. Ramsay seems to have reached the glacial theory by a *process of exclusion*, rather than by any *direct* evidence; for, having shown that the *sea* cannot form such hollows, nor *weather*, nor *running water*, and if the hollowe were not formed by *synclinal curves of the strata*, and if they do not lie in *gaping fissures*, nor yet in areas of *special depression*, the only remaining agent, according to Mr. Ramsay, "*is the denuding power of ice.*

He, nevertheless, snpports this view by two collateral considerations: 1st. In the region of the Alpe "all the large lakes lie in the direct channels of the great old glaciers—each lake in a true rock basin." 2d. The general result of the examination of the map of the world indicates that "for the rooky regions hoth north and eouth of the equator, the farther north or the farther eouth we go the more do lakee increase in numher," and "that this fact ie not a mere accidental coincidence, but is one of the strongest proofs of the former existence of that wide-epread coating of glacier ice, that in old times molded so much of the face of both hemispheres."

Notwithstanding the apparent probability of Mr. Ramsay's theory of glacier origin of mountain lakes, it is not free from the most serious physical difficulties. It is not very clear that a moving glacier would necessarily present so etriking a contrast to moving water in its capacity for eoooping out rock basine, for, so far as known, the lawe whioh regulate the flow of glaciers in monntain vallsys are idsntical with those which govsrn the flow of streams of watsr under like conditions. It is not, therefore, very obvious why its effects should not be strictly analagous to, if not the same as those of water. Like running water, the glacier movee moet rapidly near the center of ite eurface, and the motion is almoet imperceptihle at the margin and at the hottom of its hed. It is quite prohahle that the action of a glacier on its bed is, in some important features, different from that produced hy aqneoue erosion.

The characteristic striated appearance of the glaciated rocks, no lees than the *roches moutonnees* ehow that these ice-streams carry with them some of the mechanical effecte of solid hodies moving down inclined planes. But it hy no means follows that their erosive effects ehould so far differ from those of running water as to enahle glaciers to ecoop out the great lake hasins.

So far from this heing the case, would not the glacier "act as a great planing machine, wearing down the larger irregularities," and filling up the depressione with the detritue thns produced?

Moreover, when a glacial mass, in descending a sloping valley, reaches an extensive level eurface, like the hasin of Lake Superior, its motion on ite hed (if anything analogous to water), disappears, or hecomee quite insignificant, and hence its excavating or scooping power would vanish.

Thie consideration seems to render it almost certain that the numeroue lake basins of flat countries, like Finland and British America, could not have heen excavated by glaciers. And thus the principal eupport of the theory derived from the comparative profueion of lacnstrine basins in high northern latitudes, falls to the ground.

Again, as far ae known, existing glaciere do not operate upon their beds in the manner demanded hy Mr. Ramsay's theory.

Where opportunities are enjoyed of seeing part of a valley from which a glacier has retreated in historical times, no basin-shaped hollowe are conspicuous. (Lyell.)

The domed-shaped protuberances, the *roches moutonnees*, are frequent, but the cup-and-saucer-shaped cavities are wanting. (Lyell.)

Hence, it appears that without denying the glacier origin of certain small mountaine lakes, thie theory evidently fails to afford a satisfactory explanation of the vast nnmber of large and deep lacustrine hasins which are scattered over the surface of the earth in high latitudes. In truth, however, it is impossihle to speculate securely on questions of this kind without a larger eupply of *observed facts.*

Before speculating on the origin of snch basins, it is desirahle to ohtain much more exact information than we now possess in relation to the form and dimensions of exieting lake basins, and to ascertain the law of glacier motion when the ice stream reachee an extensive level surface.

Modified Glacial Theory.

Prof. Raphael Pumpelly has recently (*Am. Jr. Sci.*, 3d eeries, Vol. 17, p. 133, *et seq.* Feb., 1879,) propounded a theory in regard to the origin of lake hasins, which deserves coneideration. Pumpelly maintains that the glacial theory of Ramsay and Geikle, which assumes that snch hasins "are due to unequal sculpturing by glaciers," is useless in explaining the "lake hasins of flat countries, like Finland and British America," and still more unsatisfactory as an explanation of similar baeins in Central Asia, "hecause there are absolntely no traces of glaciation in Central Asia, outside of the high mountain chains. Prof. Pumpelly's theory seems to be that during pre-glacial times a vast nnmber of *rock-bound basins* were formed over the snrfaces of continents hy the *secular disintegration of the rocks*" while still *in situ.* It is evident that the formation of these baeins, heing due to the greater or less facility with which the rocks disintegrated nnder agencies acting through the immeasurahle pre-glacial periods, they might be of all eizes and depths. It is likewise evident that at the time of origin these basins wonld etill retain the residuary products of the secular rock disintegration; in other terms, they wonld be full of the disintegrated materials.

Now, the important question is, *how were these depressions emptied of their secular disintegrated materials.* According to Pumpelly, two agencies may have acted in removing the disintegrated materials from the rock hasins, viz., *ice* and *wind.*

I.—Ice.

In the plenitude of glacial times, when the whole northern hemisphere was covered with a cap of ice of enormous thickness, extending below latitude 40°, the disintegrated material filling the lake hasins, scattered over the comparatively level plains of northern Europe and America, was frozen to, and formed a part of, the vast ice sheet, which gradnally moved towards the equator. Consequently the contents of these hasine were dragged out by the advancing ice sheet.

II.—Winds.

Following up Baron Richthofen'e viewe, which escribes the origin of the great "Loess Formation" to the action of winds on the secnlar disintegrated rocks; that it is, in fact, "a eubærial deposit formed in a dry, central region." Prof. Pumpelly maintains that the lake hasins of Central Asia were emptied of their dry secular dieintegrated materials by the agency of winds.

Those who have witnessed the effects of sandetorms in arid regions are prepared to appreciate the important agency of winds in modifying the surface of the earth.

In concluding the discussion of the glacial origin of lakes, it may hs proper to rsmark that while saucer-shaped hasins might have heen emptied through the agency of moving ice, mechanical considerations seem to render it almost impossihle that deep cup-shaped rock hasine could have heen formed hy glacial action, either local or general. For, in these latter rock hasins, the eteep and precipitous sidee of the cavity induce mechanical conditions apparently inconsistent with the possihility of moving ice having either scooped out the hollow or dragged out the contents of the full hasin. It is true that in some inetances the precipitous condition of the sides of euch hasins might have heen a secondary effect, resulting from the snh-aqueous deposition of the detritue hrought from surrounding high ground hy glacial and aqueons agencies in operation dnring modern times.

But thie explanation is hardly applicahle to lacustrine hasins which are surrounded hy lofty and eteep mountains coming within a short distance of the margin of the lake. For example, it is difficult to imagine how the hasin containing Lake Tahoe, which is more than 1,600 feet deep within a short distance of its steep and rocky houndaries, could have heen excavated hy the agency of moving ice. But the most extraordinary chasm of this kind is the great fresh-water Siherian Lake Baikal. Thie vast reservoir is situated ahout 1,360 feet ahove the level of the sea in the midst of eteep mountain ranges, that often rise sheer from the water's edge in lofty walls of eyenite, gneiss or conglomerate. The recent reports in relation to its depth, are almost incredible. The depth of the upper part of the lake is given ae 3,027 meters (9,931 feet), ahout the hight of Mount Etna, and at its lower portion it ie said to attain a depth of 3,766 metere (12,356 feet). (*Vide Nature*, Vol. 17, p. 468.)

At the latter point these soundings show that the hottom of the lake must be depressed nearly 11,000 feet helow the level of the sea, which surpassee the greatest depth in the Mediterranean. There eeeme to be a vague impression that Lake Baikal originated in the sinking of the ground by the falling in of a subterranean cavern; hut there is probably no fonndation for such an opinion. It is proper to add that the enormous elongation of this lake (it is nearly 400 miles long) rendere the action of glacial agencies more possihle ae a cause of excavation than in the case of the much smaller cup-shaped hasins.

The foregoing viewe have been strikingly confirmed by recent expsrimental results and mathematical deductions by Mr. R. D. Oldham, contained in a paper entitled "On the Modulue of Cohesion of Ice of Lake Basins," (*Phil. Mag.*, 5th series, Vol. VII., p. 240, *et seq.* April, 1879.) Exaggerating all the data relating to the erosive action of ice, Mr. Oldham arrives at the following deductions:

1. "That no lake basin exceeding 700 feet in dspth or 5 miles in length could possihly owe its origin to glacial erosion, though the true limits are prohahly not one-tenth of these quantities."

2. "That no glacier could he pushed en masse over a horizontal plain for more than five miles."

To nnderstand the phyeical hasis of these deductions, it must he borne in mind that when the "modulus of cohesion" of the ice ie unahle to resist the "shearing stress" brought to hear upon it, there is a gradual motion of the internal portions among themselves, which is precisely analogous to the motions of viscous messes under the influence of gravity. The lowest etatum remains quiescent on the sunporting surface, while the upper portione of the viscoue mass move over it.

Gold Export of New Zealand.—The Thames *Advertiser* publishes the eubjoined return of the quantity and value of gold entered for exportation for the year ending Dec. 30, 1879:

	Ounces.	Values.
Auckland	37,901	£154,298
Picton	897	3,467
Nelson	4,851	18,648
Westport	18,120	72,482
Greymouth	68,641	274,570
Hokitika	56,203	218,675
Dunedin	92,866	367,157
Invercargill	10,003	90,011
Totals for 1879	287,464	£1,148,108

The *Railway Age*, in a recent iseue, eays: Capt. Eads etands etoutly by hie scheme of a great railway to carry ocean vessels bodily across the isthmue of Darien, and prononnces the rival canal scheme of De Lessps hopeless. He wante the Government to guarantee 6% dividends on $50,000,000 of stock, the guarantee to take effect after the works are completed, and a loaded ship of epecified tonnage, shall have been safely and satisfactorily transferred from ocean to ocean.

Prof. Aoassiz, of Boston, has become a rich man through the Calumet and Hecla copper minee of Lake Superior. His income for months past has been $2,500 a day. Within 10 years he has given to Harvard College $230,000. He is Preeident and shareholder in these mines, and is devoting most of his time to their development.

Of the American cent pieces the rarest dates are 1793, 1799, 1804, 1814, 1821, 1823, 1831, and from 1840 to 1849, inclusive. Of half cents 1793, 1795, 1796, 1802, 1810, 1811, 1827, 1836, from 1840 to 1850, inclnsive, 1852, 1854, 1855, 1856 and 1857.

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*This is the first of a series of articles by Prof. Le Conte, and of great interest to the people of the Pacific coast. The succeeding papers treat of the distribution of lakes upon this coast, of the causes of the transparency of water, etc.—Editors.

A Meteorite.

There appeared an item in the San Bernardino *Times* some time since in regard to a mass of pure iron brought in from Ivanpah by Mr. Heber Huntington. It attracted the attention of Mr. H. G. Hanks, of the State Geological Society, and at his request the *Times* forwarded the specimen to him.

San Bernardino can claim the honor of the first meteorite ever found in the State. It was discovered by Mr. Stephen Goddard, who was returning to camp one evening after a prospecting trip, some eight miles from Ivanpah. In crossing a wash, with his pick on his shoulder, the appearance of what he thought a strange boulder attracted his attention, and he struck it with his pick. It returned a ringing sound to the blow, which caused him to examine it more carefully, and finding it an object out of the common, he returned next day and took it to Ivanpah, from whence it was brought to town by Mr. Huntington, and by that gentleman was placed in the hands of the editor of the *Times* for the State Geological Society:

Mr. John Isaac, San Bernardino.—DEAR SIR: The specimen mentioned in your letter, dated Feb. 17th, came duly to hand. It requires only a glance to decide its character. It is undoubtedly a mass of meteoric iron, and as far as I know, the first one ever found in the State of California. It is customary to give names to all meteorites, by which they may be known to the scientific world, and I shall take the liberty of calling this the California meteorite. Should another be found, it would naturally take its name from the county or town in which or near which it was discovered.

Cosmical or meteoric matter, which occasionally falls to the surface of the earth from space, has always been regarded with interest and curiosity. Man, in the days of earliest history, noticed with awe and wonder that stones sometimes fell from the skies. The frequent appearance of meteors, or, as they are sometimes called, fire balls, sailing grandly through the heavens and generally disappearing in an explosion, naturally gave rise to surmise and theory, and it is not unlikely some of the well-known mythological fables had their origin in the observance of these phenomena. In more modern times, they have claimed the attention of great and celebrated philosophers, who have theorized upon them without being able to decide with certainty as to their real origin. La Place supposed them to have been ejected from the craters of lunar volcanoes; others supposed them to be planetary bodies like the earth, but immeasurably smaller, which in like manner revolve around the sun, governed by the same laws.

It is believed by many that all space, or rather all space within our planetary system and by analogy, the same in other systems, is filled with cosmical matter, which revolves around the central sun, that the larger bodies known as the planets have plowed out, so to speak, furrows or channels through which they sweep, having long ago attracted the smaller bodies within a certain space, to themselves, and that from some aberration in the movement of either the larger body or the smaller ones, at certain periods a few of them come within attraction, and fall.

It is thought further, that the zodiacal light is a cloud of meteors upon which the sunlight falls, and if I am not mistaken, the comet's tail is supposed to be of a similar nature. The reader should consider that cosmical matter may be in any conceivable or almost inconceivable state of attenuation, and still be regarded as true matter.

The meteoric theory of the sun, may be found stated in detail in Tyndall's work, "Heat as a Mode of Motion." The heat of the sun is supposed to be caused by cosmical bodies falling upon its surface. If all other heavenly bodies except the earth and the meteors could be removed to a great distance, all the small bodies would be drawn with incredible velocity to the earth, causing it to become a small sun, blazing forth with an intensity great enough to melt all known elements and to vaporize many of them. If the theory is true that the earth has made a pathway for itself, it may have been a miniature sun while doing so.

It is considered by astronomers, that the inevitable fate of all the planets of our system is eventually to fall into the sun, and Tyndall has gone so far as to calculate what will occur when this takes place, in the following words: "An asteroid striking the sun with the former velocity (390 miles in a second) would develop more than 9,000 times the heat generated by the combustion of an equal asteroid of solid coal. If the earth should strike the sun, it would utterly vanish from perception, but the heat developed by it would cover the expenditure of a century."

Having thus given some of the theories concerning these celestial visitors, your readers may be equally interested in the facts.

The name "meteorite" is a general one, and includes all bodies, extra terrestrial, which fall to the earth from space. As to their origin, it is only possible to conjecture, but the fact that they do fall is beyond question. Fire balls or meteors have time and again been seen to approach the earth and soon explode, after which a shower of stones has been seen and heard to fall, the stones were found to be hot, and to differ from other mineral substances on the earth's surface.

The sound of the explosion has often been heard over a space of 25 miles in every direction. It is calculated that these meteoric bodies become luminous when they first enter our atmosphere, which in some cases has been proved to be 40 miles from the earth's surface; the incandescence is undoubtedly owing to the friction caused by the resistance of the atmosphere, and from the same cause, intensified, the explosion takes place. The succeeding fall of fragments generally forms a zone in the direction at which the meteor approached the earth, as they seldom if ever fall from the zenith. In some cases as many as 3,000 fragments have been collected from the destruction of a single meteor.

Much of the meteoric matter that reaches the earth is in the form of cosmical dust, and is much greater than is generally supposed, and, as the volume of the earth is to that extent increased, the effect this cause exerts on the movement of the globe is an interesting and important astronomical question.

Meteorites are divided scientifically into groups or classes based on their chemical or mineralogical nature, as follows:

1. Holosiderous.—Consisting of nearly pure iron; so much so that it can be put to all the uses of the best wrought iron. It is always associated with other metals in small quantities, nickel being seldom if ever absent.

2. Syssiderous.—Iron meteorites which are a sort of transition to the stony varieties. In the iron are found certain imbedded minerals, as peridot and pyroxenic silicates.

3. Sporadosiderous.—Stony meteorites in which the metallic iron is disseminated in grains, variable in size.

4. Polysiderous.—The metals and silicates may exist in nearly equal quantities; each granule is seen to be enveloped in a metallic coating; the stony matter is generally peridot or olivine, and pyroxene.

5. Oligosiderous.—This is the most common form. The siliceous mineral resembles trachyte. This variety contains a number of minerals common to the earth: nickeliferous native iron in very small grains, troilite, which is a sulphide of iron, chromic iron and several silicates.

6. Cryptosiderous.—In which the quantity of metallic iron is small but in which the number of terrestrial minerals is greater, in one instance as follows: Augite, anorthite, apatite, titanite, chromic iron, magnetite and magnetic pyrites.

7. Asiderons.—In which no metallic iron can be discovered.

The holosiderites are considered the most interesting of the meteorites; they may be seen in all of the great museums of the world, several large masses have been found in Mexico, New Mexico and in Arizona. The "Irwin-Ainsa" meteorite weighs 1,400 pounds; it was found near Tucson, Arizona, and was presented to the Smithsonian Institution. Dr. Irwin, through whose influence it was sent to Washington, says that the inhabitants of Tucson have a tradition that a shower of meteorites fell in the Santa Caterina mountains about 200 years ago, and that other masses of a similar character yet remain in these mountains.

Another specimen from Tucson, was presented to the city of San Francisco by Gen. James H. Carleton, which is now at the rooms of the California Pioneers. A description of it may be found in the proceedings of the California Academy of Science, vol. 3 folio 48, and a full analysis by Prof. Bush, of Yale College. In the same volume, folio 30, Prof. Whitney has shown that a belt or path of meteorites lies nearly in a line from the Colorado river at La Paz to San Luis Potosi, in Mexico, possibly fragments of the same meteor. A mass of metallic iron was found by Dr. Evans on Bald mountain, near Port Orford, Oregon. It will be seen by referring to a map that San Bernardino is in the same general direction. Now that you have found the first meteorite in California, it will be well to look for other fragments which are likely to be discovered.

This specimen should not be allowed to leave the State, but should be donated to the State Museum, which sooner or later will be instituted. HENRY G. HANKS.

Since the above was published, Mr. Hanks has recalled to mind a small mass of metallic iron brought to this city in 1871, when it was seen and described by Prof. B. Silliman in the *American Journal of Science and Arts* for July, 1873; with a figure from a photograph by Watkins of San Francisco. The name of the new meteorite will therefore be "*The San Bernardino Meteorite.*"

A PATENT CHALK MARK.—Not long ago, says an exchange, a man applied at the Patent Office, in Washington, for a patent of an invention which was refused, as the Examiner said, "because the invention was merely a chalk mark," and a man must be crazy to suppose that a chalk mark could be patented. But the man went into court and last week got a decision in his favor, in the shape of a mandamus compelling the Commission of Patents to issue the patent. The Judge said that a chalk mark could be patented if its application was useful and original. In this case it was applied to a piece of pasteboard, cut in a strip and fastened together in a circular form, with beveled edges, so that it could be slipped over sugar buckets, jars of sweetmeats, etc., to which insects are attracted. The man claims that all insects are repelled by chalk; and this circle of pasteboard, well chalked and tightly fitted, will act as a perfect guard against them.

Useful Information.

PUTTING UP AND RUNNING STEAM PUMPS.—The Dean Pump Works, of Indianapolis, gives the following valuable hints on the management of steam pumps: Never use a smaller pipe on the suction than the list indicates. Avoid right angles in the pipe where it is possible. Where it is practicable, make bends with a large radius. Put a foot valve and strainer on the end of the suction pipe. Do not place the pump more than 29 feet from the water. Where hot water is pumped, the supply must be above the pump. Make all joints in the suction pipe tight. A small leak in the suction is very detrimental. Keep the stuffing boxes nicely packed. Oil the pump before starting it, and keep the oil wiped off where it is not needed. Some engineers seem to think that if their boilers are supplied with water, there is no need of looking after the pump or taking any care of it. A good pump is as worthy of being taken care of as a good engine, and we would suggest to all engineers and persons using or having charge of pumps, that they spend a few minutes every day in cleaning them up, removing all extra oil on them, wiping off the dust and dirt and seeing that they are in good condition and working well.

HINTS ON THE USE OF PLASTER OF PARIS.—The plaster may be made to "set" very quickly by mixing it in warm water to which a little sulphate of potash has been added. Plaster of Paris casts, soaked in melted paraffine, may be readily cut or turned in a lathe. They may be rendered very hard and tough by soaking them in warm glue size until thoroughly saturated, and allowing them to dry. Plaster of Paris mixed with equal parts of pumice stone makes a fine mold for casting fusible metals; the same mixture is useful for encasing articles to be soldered or brazed. Casts of plaster of Paris may be made to imitate fine bronzes by giving them two or three coats of shellac varnish, and dusting on fine bronze powder when the mastic varnish becomes sticky. Rat holes may be effectually stopped with broken glass and plaster of Paris. A good method of mixing plaster of Paris is to sprinkle it into the water, using rather more water than is required; when the plaster settles, pour off the surplus water and stir carefully. Air bubbles are avoided in this way.

NEW FLUID PROPELLER OR MOTOR.—Mr. John B. Vliet, of Dartford, Wis., has invented a device for propelling fluids through tubes, and also for utilizing the motive force of fluids flowing through tubes. A wheel having diagonal blades is mounted upon a shaft journal axially in a cylindrical casing. This shaft is supported by a hollow cylinder which covers the sides of the wheel, leaving only the blades exposed. The inner cylinder has conical ends, and is connected with the outer cylinder by hollow arms, through which passes a belt which drives the wheel when the device is used as a fluid propeller. When the machine is used as a motor the belt receives its power from the pulley on the wheel shaft. The inventor proposes, in addition to the uses already named, to use the device as a fluid meter. In actual use the main casing will be connected with the pipes through which the fluid is to be moved, or through which water flows if it is used as a motor.

A HOUSEHOLD WATER MOTOR.—In Zurich, Switzerland, the use of a portable water power, so to speak, is being extensively used for household purposes. Firewood, for example, is to be sawn into convenient lengths for burning. A small sawing machine on wheels is drawn by two men to the front of a house. They connect by a flexible tube with the nearest hydrant; the water flows to the machine; the saw dances and cuts up the wood with surprising rapidity. A portable turbine has also been invented, and employed in many places in the same city, in driving a Gramme machine for the production of electric light. Water is very abundant in Zurich; but there are other towns in which this domestic water power could be advantageously introduced. Where it is any object to keep a record of the water used, an indicator showing the quantity may be affixed to the machine.

ARTIFICIAL stone can be produced by the following process, recently discovered by Ternikoff: "A mortar consisting of equal parts of lime and sand is exposed for a few hours to a temperature of 150 degrees centigrade in the presence of water vapor. The paste having been taken out of the furnace is now passed under the cylinders of a machine like that used for molding bricks, and it comes out in the form of cubes which, on being exposed to the air, become dry and hard. In the course of eight or nine hours these cubes are as hard as good building stones, and are fit for use. This artificial stone is, in fact, a sort of brick of mortar baked at a low temperature, and the cost, too, is about the same as that of bricks."

WHITE gutta-percha is obtained by precipitating a solution of ordinary gutta-percha in chloroform by alcohol, washing the precipitate with alcohol, and finally boiling it in water, and molding into desired form while still hot.

TO REMOVE INK STAINS.—Take of muriate of tin two parts, water four parts. To be applied with a soft brush, after which the paper must be passed through cold water.

Good Health.

Evils of Neglecting Cold in the Head.

In a paper read by Dr. D. B. St. John Roosa, at the recent meeting of the Medical Society of the State of New York, he stated that the most frequent origin of chronic diseases of the lachrymal passages, of the conjunctiva, and of the middle ear, is in a neglected "cold in the head." It is generally conceded that no person in perfect health, except under extraordinary circumstances, takes cold, and yet the majority of mankind have, at some time, suffered from cold in the head. The popular idea that a cold in the head is an insignificant affair is founded on the fact that most of the people recover to such an extent that they are able to go about afterward and engage in their ordinary avocations without special notice, at the time, of the consequences of the disease, which may even then be settled upon them. He believed that very many of the maladies which prevented men and women from reaching the allotted period of three score and ten have their origin in these colds; and that many serious affections which act as an impediment to the success of their victim are dated from a cold in the head.

He described the suffering incident to an acute attack of cold in the head, and of the impossibility of having repeated attacks without producing serious local changes—not only local change, but a permanent impairment of nutrition. To correct all this, special attention must be paid to *individual* hygiene, and if the evil consequences of neglected cold in the head were to be abolished, the abolition must come through a public sentiment properly educated upon this as upon all other sanitary questions. The family physician must warn the people everywhere, as opportunity offers, of the danger in this direction, and of the means by which it is to be avoided. The first great precaution to be taken by each individual is to keep himself in a good general condition, and to do that he must studiously avoid all that tends to disorder the skin and the functions of all the organs of the body. Children must be clothed in flannel all the year round, and must be made to know that the staples of diet are milk, bread, meat, vegetables and fruit, and that tea, coffee and pastry of all kinds are to be used only as the greatest of luxuries, and therefore in small quantities and at long intervals. The community can only become healthy as individuals become healthy, and all the reforms necessary to make Memphis and Granada places in which yellow fever never comes may be adopted; but if the control cannot be obtained of the bodies of, and the modes of living of the individuals in those and all other places, evils not so suddenly fatal, but none the less in the end dangerous, and all the time injurious to their well being, will certainly exist.

CAUSE OF INTERMITTENT FEVER.—The July number of the *Zeitschrift*, edited by Prof. Klebs, contains some particulars of an investigation into the physical cause or poison to which marsh or intermittent fever is due. The inquiry was conducted by Prof. Klebs, of Prague, in conjunction with Signor Tommasi, Professor of Pathological Anatomy at Rome. The two investigators spent several weeks during the spring season in Agro Romano, which is notorious for the prevalence of this particular kind of fever. They examined minutely the lower strata of the atmosphere of the district in question, as well as its soil and stagnant waters, and in the two former they discovered a microscopic fungus, consisting of numerous movable shining spores of a longish oval shape. This fungus was found to be artificially generated in various kinds of soil. The fluid matter obtained was filtrated and repeatedly washed, and the residuum left after filtration was introduced under the skin of healthy dogs. The animals experimented on all had the fever, with the regular typical course. After explaining minutely the results of their various investigations and experiments, these gentlemen are of opinion that they have discovered the real cause of the disease in question. As the fungus grows into the shape of small rods, Tommasi and Klebs have given it the name of *Bacillus malariæ.*—*Medical Times and Gazette.*

SPOTS ON FINGER NAILS.—The white spots which appear on our finger nails are due to the variable nutrition of the nails. When the vital forces are vigorous and every part of the body is supplied with good blood, their growth is steady, and there is uniformity in color and consistence. It is a peculiarity in the growth of the nails that if a person experience a severe attack of disease, or some strange shock to his organization, the nails will indicate it. There will be a change of color, a partial cessation of growth, and as they emerge from the skin, ridges may appear. In some remarkable cases the nails have dropped out as a consequence of illness.—*Phrenological Journal.*

GRAY HAIR.—The causes of gray hair are numerous. One that is fundamental is inheritance; another is weakness of constitution; another is improprieties of life, or bad habits, while climate also has something to do with it. Where it is constitutional for the hair to grow gray early, the effect upon the health is nothing. It is the opinion of a good medical authority that most of the cases of premature gray hair are due to the "fast" or dissipated habits of young people.

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The Week.

After a long continued storm of rain, the warm snnshine bas made its appearance and seems to revive the drooping energies of men, as well as to start into more rapid growth the vegetation in the fields of the farmers. It is to be hoped that the genial temperature may continue during the proper season, and add hy its influence to the speedy maturity and abundant quantity of the coming crop. Our jobbing merchants are full of business; the outside orders are not large, but such as the necessities of the interior demand; and their smallness compels them to he more frequent, consequently keeping the dealers more continuously employed. The trade of the State and the slope has never heen in as sound a condition as it is at present. Buyers have learned the danger of excessive purchases, and the sellers prefer to fill moderate and sure orders, rather than to incur the risk of filling more ample ones.

Our mining interests are progressing upon a sure and safe hasis. Investors are exercising, as a general rule, more care and caution in their investments, and require positive proofs of excellence in mines before emharking in their exploration and development. When—if such should ever be the case—the operations in this channel are conducted upon rigid, economical and careful principles, mining will cease to be any more speculative than the purchase of a stock of goods in the hope of disposing of them to customers. It must then become the leading industry of the Pacilio coast.

The warm weather will soon set the hydraulic mines "booming" again, and there has heen so much snow this winter that an ahundant supply of water is stored up for the season, which is expected to he a prosperous one.

The arrangement has been completed whereby the Pacific Coast Blood Horse Association bold the spring meeting on the Bay District course. In all prohahility the races will he the best ever held in the State.

In the Parliamentary elections in England the Liherals have gained 58 seats and lost 17, while the Homo Rulers sbow a gain of tbree seats.

Active Outside Mining Centers.

While the mors productive mines and mining localities of California are gensrally diffused throughout the metalliferous regions of the State, a like condition of things prevailing also in Utah, the mineral wealth of most of our neighhors appears to have been largely aggregated in isolated and oftsn widsly separated districts. Thus there are in Nevada not more than a dozen camps that have been much distinguished for their output of hullion, while in Arizona, Idaho, Montana and even in Colorado, the number is still less.

Having recently had something to say about the condition and progrsss of mining in Utah and California, we add here some remarks on the outlook for this industry at what promises to hecome very soon some of its more active centers in Idaho and Montana. In the former, these localities, judging from presant appearances, will prove to he the Carihou district and the Snaks River country in the southsrn and southeastern, and the Salmon Rivsr region in ths central part of ths Territory, into which a considerahle population is likely to be attracted the present spring. To Snake river there will not he such a rush this year as there was last, only such miners returning as have ditches for introducing full and steady supplies of water on their claims. Those who depended upon wheels and like expedients for raising water from the river upon their claims, fonnd these means so uncertain and inadcquate last year that they will hardly care to experiment further with them hereafter; hence there is likely to come less disappointment to those seeking to operate on that stream in the future. As the Salmon River and Yankee Fork country lie pretty well in the interior and ie very elevated, the working season there will not open until late in the spring, notwithstanding the mineral deposits are of a character calculatsd to stimulate the adventurous to earnest efforts at making their way into them.

Of the Caribon mines very glowing accounts reach us as well through the press of Idaho and Utah as through more private hut equally reliable channels, leading ns to think that they will draw to them hoth capital and population at an early day; they heing more easy of approach from the great central lines of travel, and situated in a less snowy country than the Salmon River mines. The deposits here consist of gold-hearing quartz, the lodes being of great size, the ore rich and the metal free; conditions that ought to make these mines attractive alike to tho prospector, the lahorer and the capitalist, all of which classes are said to he pretty well represented in the district already. As usual, some of our most shrewed San Francisco investors have managed through their agents to ohtain large interests in this Idaho Carihou, in advance of its great merit gaining general publicity. Not here, however, as at Silver Reef, Frisco, Uinta and other localities in Utah, bave these sharp operators been ahle to secure the entire wealth, or perhaps even the choice properties in the district, these latter heing altogether too numerous to bave heen corralled by any one or even several parties, however shrewdly they may have managed or whatever their financial strength. It would appear, in fact, that locators there have felt such confidence in the ultimate outcome of their claims, that they have heen in no hurry to dispose of them, preferring to hold on and develop them rather than part with them at mere nominal prices, a circumstance tbat speaks well for the permanent prosperity of the district.

In Montana mining operations are destined to he especially lively the coming summer in the Butte district, where the Walker Bros., of Salt Lake City, are large interested, having invested there in mining properties and improvements to the extent of a million dollars, or more. For taking the general supervision of their large interests and operations at that point, these parties have secured the services of Prof. J. E. Clayton, who is already on the ground, and will hereafter give to the work his individual attention. For filling this important position the proprietors could have made no hetter cboice, a factof which they were douhtless well advised through their hnsiness relations and intimate acquaintance with Prof. Clayton, extending over a long series of years. The situation, it is reported, will he made one of great pecuniary advantage to tbe Professor.

The Mechanics' Fair.—The managers of the Mechanics' Industrial exhihition have decided to commence the fifteenth annnal exhihition on the 10th of August, and to continue it five weeks from that date. The following gentlemen constitute the Board: President, Irving M. Scott; Vice-President, P. B. Cornwall; Treasurer, J. A. Bauer; Directors—A. L. Fish, C. Waterhouse, James Drury, Nathaniel Hunter, Samuel Dinsmore, David Kerr, A. W. Starbird, F. A. Frank, Edward Fretwell, J. R. Wilcox and Geo. H. Hopps. It is to he hoped that all our mechanics and manufacturers will hegin in time to prepare their displays, and that we shall have a better exhihition than we ever had hefore.

The United States steamer *Pensacola* left Panama on March 12th for this port. She will stop at all the ports on the way, and may be looked for here the latter part of this month.

The Pleasure of Labor.

Wben tbe fiat of omnipotsncs was nttersd to man: "In the sweat of thy face shalt thon eat bread," there was an intermixture of mercy in the punishment hy toil then decresd, and the self-consciousnsss of duty performed mitigatsd the sesming harshness of the penalty.

Wben the toiler has accomplished his allotted task the sensation of having done so, blended with the anticipation of peaceful rest, produces a pleasnre and a delight whicb ths idler can never experience. To have lahored with an object in view, and to have accomplished the desired result, is a gratification which rsnders tbe toil less irksome and lightens ths fatigue attendant upon it.

In whatevsr field of labor man may put fortb his exertions, the satisfaction of seeing the consummation of his efforts creates a joy which amply compensates him for having labored. If he is working for recompense, the receipt of his earnings gives to him the proud fesling of indepen-dence and of self-sustaining powers. He receives the trihuts for his lahor as a just return for it; it is his hecause he has given his strength of muscle or of brain for it. The obligation was mutual hetween the employee and the employer. One had the means with whicb to purchase, the other had the lahor to sell. Of the two the lahorer stood upon the firmest pedestal. The riches of the one might "take to themselves wings and fly away," hut the hrawn of tbc otber would always he availahle.

The autbor may have passed long years in gatbering the facts or the knowledge which he transcribes on the pages of his volume; but when the task is finished and the hook goes forth to he scanned by his fellow men, he feels a glow of pleasure in having awakened from their dormant slumber in his brain the ideas which shall create iu his readers sensations of delight or thoughts of an elevating nature. If he has added to the general intelligence of the world; if his words have given strength to the weak; if they have nerved the wavering to steadiness of purpose; if they have dried tho tear of sorrow; if they have brought into existonce the cbeering smile, or the kindly glance, he knows that his toil has not heen in vain, and there comes to his soul a reward which is above all price when he considers the benefits he has conferred npon his race.

The artisan may etrike heavy blows and tax his muscular power to its utmost extent as he forges the shaft, or tempers the tool with which to complete bis work, which, wben finished, he exhihits with honest pride, as its utility and excellence of design are self-cvident to all. If by it he has lightened the hours of toil; if be has increased the power of production; if he has made the seasons of rest to the wearied ones longer and more frequent; if he has given to the homes of all more comfort, heauty and cheerfulness; if he has rendered life's hurthens less difficult to hear, he must find a gratification in the result of his labors sucb as tbe drono could never know.

If the toiler is working for the support of his family how will his heart throh with delight as he witnesses the happiness which the expenditure of his wages hrings into his home. His fare, simple though it may he, seems to him like a luxurious and sumptuous hanqnet, sweetened as it is hy the glad satisfaction that he has added to the joy of the loved ones there. If he has brought to tbem pleasing apparel; if he has given them wherewith to adorn themselves; if he has found for them the long-wished-for object, even if it he hut a trifle in itself; if be has hrought to them the volume, the picture, or some article of utility; if he has contrihuted to their joy or their happiness, he finds his own still more augmented as he receives tbeir grateful acknowledgment for his kindly gifts.

Does not the artist, in the rich enthusiasm which pervades his soul, as the delineations of his conceptions of the heantifnl are traced in hrilliant hues, or cut from the Parian, experience a delight which seems to transcsnd all earthly hliss, and he far deeper and purer even for a hrief moment, than the pampered idler could experience during the whole period of his existence.

Lahor adds to the complete development of the physical and mental powers. It creates a healthy condition of the hody and mind, and such a condition is always conducive to happiness. Lahor does not depress; it recuperates and strengthens, and in the full flow of spirits and the flush of physical well heing, there arises a pleasure and enjoyment that indolence can never hring into action.

H. B. M. frigate *Triumph*, flagship of the Pacific squadron, Commander Rear Admiral Frederick H. Sterling, arrived at this port on Saturday last, 18 days from Acapulco. The *Triumph* is an armor-plated frigate of the first-class, carries 14 guns of heavy caliher, measures 6,650 tons, and her engines have a nominal horse-power of 800, capahle of heing worked up to 4,892.

Bodie has levied assessmsnts aggregating $2,480,000. Its dividends have heen $2,850,000. Excess of dividends, $369,500. The dividends have *all* heen paid hy two mines, viz.: Standard, $1,650,000; Bodie, $1,200,000. Only $75,000 were put into these two mines, which produced nearly $3,000,000.

Mineral Department of the University.

We ses it statsd that tbe item of $31,000 for the Univsrsity of California, in the Assembly gsneral appropriation bill, has heen reduced to $15,000. This reduction of $16,000 is exactly the amount asked for equipping the Dspartment of Mineralogy and Economic Geology, and it appears likely that that department will go hsgging again.

It is significant, at the same timo, that Wasson's hill, for the establishment of a mineralogical collsction in San Francisco—to which we have prsviously rsferred at length—has passed ths Assembly.

As this bill practically duplicatss tho department, collsctions and functions at the Universitv, its friends have douhtless besn instrumental in striking off the $16,000 above refsrred to. This money is absolutely necessary for the equipment of the mining department of the University, in order that it may discharge evsn its strictly University functions. The mining department will he sadly crippled unless this monsy is voted. If ths mining bureau, to hs established by Wasson's hill, is only to collect mineralogical specimens, as it appears, there is absolutely no demand whatever for its existence, since its functions can he hettcr performed hy the University, where there are now the State Geological Survey collections, those of H. G. Hanks, F. L. A. Pioche, C. D. Voy, and a large amount of material from other sources. These collections are tbe best in the State and a new bureau could not collect one as good in the aggregate in ten years. While a mining hureau might be useful if scope enough were given to it, the single collection of minerals will he of little henefit to practical miners, since the University can furnish all that is desired in that direction. Whether Mr, Wasson's bureau is established or not, we hope tbe mining department of the University will not he crippled for lack of a few thousand dollars to equip it.

Legislative Matters.

A great deal of time has heen occupied tbis week over the discussion on the dohris question, but we have not the space to give the argument and statements made. No decision has yet been arrived at. The tax whicb will fall upon tbe varions counties under the proposed hill to keep the debris off tho farming lands by huilding dams is as follows:

Alameda, $20,843.44; Alpine, $284.82; Amador, $1,270.70; Butte, $5,250.77; Calavcras, $991.29; Colusa, $5,668.26; Contra Costa, $3,518.47; Del Norte, $333.84; El Dorado, $1,163.73; Fresno, $3,036.68; Humboldt, $2,559.37; Inyo. $867.64; Kern, $2,756.96; Lako, $1,078.20; Lassen, $611.88; Los Angeles, $7,895.02; Marin, $3,983.28; Mariposa, $738.65; Mendocino, $3,003.42; Modoc, $545.46; Merced, $2,517.05; Monterey, $3,626.40; Napa, $3,998.29; Nevada, $3,516.59; Placer, $2,917.82; Plumas, $1,022.48; Shasta, $976.78; Sacramento, $8,998;25; San Bsrnardino, $1,204.19; San Diego, $2,083.59; San Francisco, $127,432.95; San Luis Obispo, $2,072.95; San Mateo, $3,255.80; Santa Barhara, $2,093.58; Santa Clara, $13,995.22; Santa Cruz, $3,254.39; Sierra, $809.84; Siskiyou, $1,319.01; Solano, $4,511.05; Sonoma, $7,774.33; Stanislaus, $2,712.55; Sutter, $1,994.06; Tehama, $1,919.73; Trinity $403.32; Tulare, $2,403.23; Tuolumne, $826.77; Ventnra, $1,518.09; Yolo, $4,966.48; Yuha, $2,145.70; San Benito, $1,905.11. Total, $293,483.05. Thcse figures are hased on last year's assessment rolls.

The Assemhly passed the Tuttle-Braunhart mining bill hy a vote of 44 to 17, hut the Senate Committee has amended it very materially. David McClure appeared for the hrokers, and claimed that the Legislature had no power to impose a tax for a Mining Commission under the Constitution. The committee thought the same way, and struck ont all that part of the hill imposing a tax. Section 5, providing for liling a hond hy corporations outside of the State, was struck ont. That part of Section 7 requiring officers of mining companies to file bonds was struck out, as was all that about perqnisites of the Commissioner. As amended, the hill is completely nullified.

The Committee on Corporation have reportsd for passage Senate bill No. 60, providing for the rsmoval of officers of mining companies. Wasson, of Mono's, Mining Bureau hill led to another dehate—May, Merry, McCallion, Braunhart and McIntosh opposing the hill, as it took $30,000 from San Francisco and created useless office, entailing great expense.

It was defended hy Tyler, Anothony, and others. The hill was passed—ayes 44, noes 24—May changing and giving notice of reconsideration.

In New York Govcrnment honds are quoted at 107 for 4s of 1907; 103½ for 5s of 1881; 109½ for 4½s; sterling, $4.86@$4.89; silver hars, 114½; silver coin, ¼ discount huying, par selling.

Company C, Sixth Cavalry, has heen ordered from Arizona to New Mexico, to assist in the protection of the settlers of that section.

The death of Rear Admiral Thatcher, U. S. N., is announced from Boston.

The Sun.

As Described by Prof. R. A. Proctor.

The citizens of San Francisco have enjoyed a rich and rare privilege during the past week in listening to a series of three lectures from that world-renowned scientist and physicist, Prof. Richard A. Proctor, of the Royal Astronomical Society of England. The audiences have been the most select of any which have ever greeted a public lecturer on this coast. Every seat in the large hall has been filled at each lecture, and even the standing room has been crowded, until it has been necessary to discontinue the sale of tickets even for the privilege of standing. The first lecture was delivered on Monday evening, at the Mercantile Library hall, and is the only one for a report of which we have space in the present issue. The subject,

"The Glory, Nature and Magnitude of the Sun,"

Was most ably treated, and a well digested review was given of the most recent scientific researches into this particular sphere of astronomical study. The lecture was profusely illustrated with brilliant stereopticon views of the solar system, and of the sun in all its varied and interesting phenomena.

It is easy, said the lecturer in opening, to estimate in figures the magnitude of the sun and its distance from the earth, but it is difficult to convey to the mind any correct idea of what those figures really represent. The lecturer had in early life endeavored to gain some idea of the magnitude of the American continent; yet he had but recently been able to form any really adequate idea of it—and that was accomplished only through crossing it by rail. It is easy to say that the sun is from ninety-two to ninety-three millions of miles distant; but a railroad journey that distance would require 500 years. A cannon ball, moving at its initial velocity, would require thirteen years to get there, while the report would not reach the sun until half a year later. Another interesting illustration in this direction has been given by supposing a human arm extended from the earth to the sun; 130 years would be required for the nerves to inform the head that the fingers were burned by coming in contact with the solar surface. The sun possesses a most

Wonderful Power of Gravity.

It controls the entire solar system and keeps all the planets in their order, as they continue in their grand, silent progress through space. So great is its power of attraction, that a half-ounce weight, if raised above the surface of the sun and dropped from rest, would acquire a velocity of 435 feet in the first second. Its magnitude is 108 times the diameter of the earth, and exceeds it in volume 1,252,700 times.

The Heat of the Sun.

To form an approximate idea of the heat of the sun, we must remember that it is estimated it would require the heat from 11,700 trillions of tons of coal, consumed in every second, to produce a heat equal to that diffused by the sun in the same space of time. Of all this immense emission of heat, only one part in 230 millions falls upon the earth. All the rest appears to us to be wasted in space. Yet this seeming waste has doubtless a meaning, and is probably subservient of some other kind of work or good, associated with the great whole of the universe. Without the heat which results from solar rays, every form of life on earth would cease. The same is true, relatively, of all stars, which are suns to other systems. A beam of

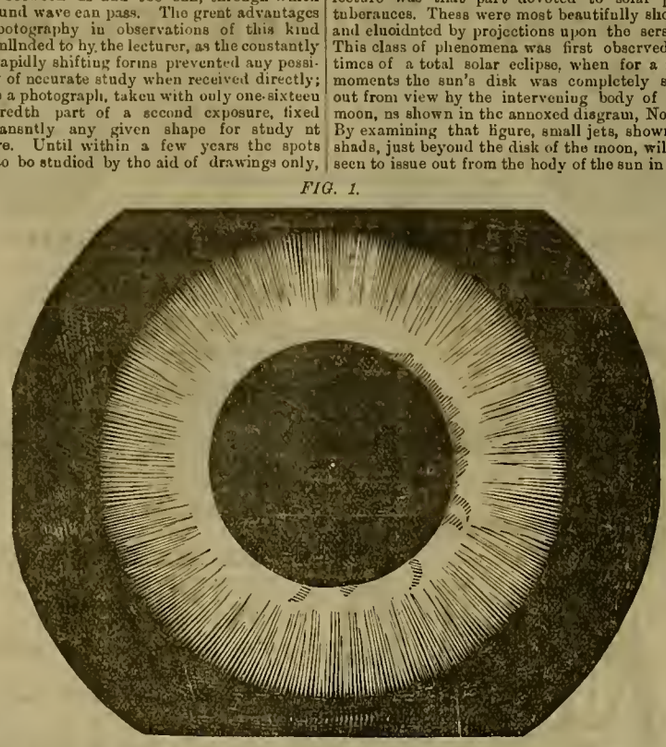
The Sun's Light

Is 150 times more intense than that of the lime light—such as the lecturer was using to project his illustrations upon the screen. We know this, in degree, from the fact that when the lime light is placed between the observer's eyes and the sun, the lime light appears as a black object. Even the intense light of the electric arc is one-third less than that of the sun. The sun is brighter in parts than it appears to the eye. Floating in its upper atmosphere are clouds of intense brightness, many times brighter than the average glow of that luminary. These clouds are technically known as "rice grains," which give to the sun, as viewed through a telescope, a fine mottled appearance. This was beautifully shown upon the screen. These clouds are thought to emit 99% of the sun's light. But, instead of being composed of the vapor of water, as clouds in our atmosphere, they are the vapors of iron, magnesium, calcium, copper, etc., heated to an intense degree of luminosity. Another class of most important and interesting phenomena is what is known as

Sun Spots,

Which were shown in a most strikingly vivid manner from photographs of the sun's face, as taken by Dr. Rutherford. These views were telescopic, and portrayed the lights and shades of the sun's surface in a most striking manner, showing the spots with long, cirrous threads, now radiating *from* the spots and again seeming to reveal an inward draft towards the sun's center. The physical characteristics connected with these phenomena were briefly alluded to and explained so far as science has penetrated into their mysteries. Every change in one of these spots, said Mr. Proctor, must be accompanied with atmospheric turmoil and disturbance, to which the most terrific phenomena of tornadoes and volcanic eruptions upon earth are but gentle zephyrs and harmless detonations. The terrific noise by which they must be accompanied is such as no human ear could hear; but which is utterly lost by the great void between us and the sun, through which no sound wave can pass. The great advantages of photography in observations of this kind were alluded to by the lecturer, as the constantly and rapidly shifting forms prevented any possibility of accurate study when received directly; while a photograph, taken with only one-sixteen hundredth part of a second exposure, fixed permanently any given shape for study at leisure. Until within a few years the spots had to be studied by the aid of drawings only,

FIG. 1.



which were generally quite imperfect. The lecturer here jocularly alluded to such exaggerations in a book on the sun, published a few years ago "by a man named Richard A. Proctor." The question,

Of What the Sun is Composed?

Was briefly discussed. Some progress had been made in the solution of this question, but only enough to discover that we know but very little about it. The principle of spectrum analysis was explained by beautifully illuminated diagrams in colors; also the manner in which the principle was made applicable to determining the nature and composition of the heavenly bodies. By the use of the spectroscope it has been most unmistakably shown that quite a number of elements known on the earth existed also in the sun, and that some elements existed there which are not known on earth. Among the elements common to both were sodium, calcium, magnesium, aluminium, hydrogen and several others. The existence of oxygen in the sun was somewhat uncertain in the minds of many; while others, including the speaker, Prof. Young and several other prominent astronomers, believed that its presence in our luminary had been fully proven. One new metal, unknown here, was instanced, and had been named by Prof. Young, helium, from *helios*, the Greek for sun.

Solar Protuberances.

Perhaps the most interesting portion of the lecture was that part devoted to solar protuberances. These were most beautifully shown and elucidated by projections upon the screen. This class of phenomena was first observed at times of a total solar eclipse, when for a few moments the sun's disk was completely shut out from view by the intervening body of the moon, as shown in the annexed diagram, No. 1. By examining that figure, small jets, shown in shade, just beyond the disk of the moon, will be seen to issue out from the body of the sun in the form of flames. When properly observed, these jets have a red, flame-like appearance, and the spectroscope has revealed to us the fact that they are really tongues of flame or incandescent gas, which are now known to shoot up from all parts of the sun's surface to the distance of fifty, an hundred, and even, in one case, at least, to the enormous altitude of 210,000 miles. Astronomers are now enabled to make their observations at any time, without any regard to the presence of an eclipse. These flames are supposed to be caused by explosions or eruptions from within the more solid portion of the sun's body. The lecturer gave it as his opinion that the flames seen, which are known to consist of hydrogen, sodium and magnesium gases, merely mark the track of more solid, but unseen matter—molten material—just as the flame and smoke which issues from the mouth of a cannon, marks the track of the unseen ball.

FIG. 2.

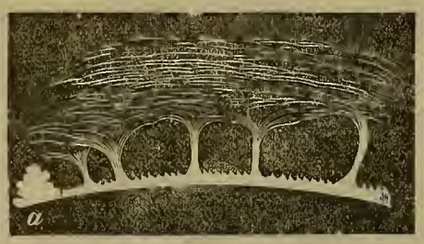


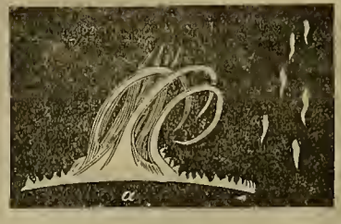
FIG. 4.

FIG. 3.

Remarkable Explosion in the Sun.

One of the most remarkable of this class of phenomena ever observed by any scientist, occurred some ten or eleven years ago, while Prof. Young, the well-known American astronomer and scientist, chanced to be observing our solar luminary. A description of this phenomenon formed a most conspicuous, and perhaps the most interesting part of the lecture, and the phenomena itself developed an outburst of solar energy most remarkable for its suddenness and violence, and one which shows what *can* be done in the way of explosions when all the conditions are on a scale of grandeur commensurate with the magnitude and anomalous physical energy of our great solar luminary. So much interest attaches to this portion of the lecture that we herewith produce several very perfect drawings of the stereoptic views, with which Mr. Proctor most happily illustrated his remarks. Those who were present cannot fail to observe the perfect accuracy in all the detail, with which our artist has reproduced them.

FIG. 5.



While viewing the sun, and studying a tree-like prominence, shown by the lecturer, but not reproduced here, Prof. Young noticed a smaller mass of cloud to the left, glowing with a brightness quite superior to any other portion. The tree-like prominence gradually passed away and assumed the very peculiar appearance as shown in figure 2—the glowing cloud upon the left still remaining but little changed, as at *a* in the same figure. The length of this cloud, by careful measurement, was about 100,000 miles, by some 54,000 in hight. Just at this moment the Professor was most unfortunately called away and was absent about half an hour. When he returned, the whole thing had been literally blown to shreds by some inconceivable explosion or up-rush from beneath. In place of the quiet but threatening cloud which he was observing when he left his instrument, his vision was greeted by the remarkable appearance as shown in Fig. 3, with "the little bright cloud" disrupted, as shown at *a* in same figure. Some portions of the fragments, or fusiform filaments, into which the larger cloud was separated, reached the enormous hight of over 200,000 miles. These filaments gradually faded away like dissolving cloudlets, while the little disrupted cloud at *a*, Fig. 3, grew and developed into a mass of rolling and ever-changing flame, to all appearance. At one time it rose, as in Fig. 4, to a hight of 50,000 miles. Then it was drawn out into long filaments, which were most curiously rolled backwards and downwards—something like the volutes of an Ionic capital, as shown in Fig. 5. Within the space of about an hour and a half, it had entirely disappeared.

It was remarked by the lecturer that the velocity with which the eruptive matter, as shown in Fig. 3, left the sun's surface, was 500 miles per second—a velocity so great that it could never have returned to that luminary. It was thus, no doubt, that the sun was forcing from itself matter which could never return to it—a power which the earth and all the planets, great and small, possessed in their original, incandescent state.

It was remarked that, after all, our best astronomers know but very little about the sun, and, with a singular paradox, all their greatest discoveries have been made while that luminary was in the utter darkness of a total eclipse. In fact, the best knowledge which a man can acquire, under any circumstances, is most incomplete and unsatisfying to the earnest and intelligent seeker after knowledge.

There was more than ordinary interest manifested as the distinguished lecturer proceeded with his address, and as each illuminated diagram was in turn projected upon the screen and dilated upon with a clearness and distinctness which held his large audience with a most silent and enwraped attention, the fact must have been apparent to him that the highly pleased company of intelligent faces before him came to learn, and were all most intensely gratified.

Mr. Proctor, in conclusion, spoke of

The Mysteries of these Infinities

And how bewildered and lost the human mind becomes in contemplating such vast magnitudes and distances, as are involved in the science of astronomy. He took his leave of his audience after reciting the following lines from Shelly:

> In the interminable wildness
> Of worlds, at whose immensity
> E'en soaring fancy staggers,
> Here is thy fitting temple;
> Yet not the lightest leaf
> That quivers to the passing breeze,
> Is less instinct with thee!

Close Working of Ore.—Mr. Miles B. Dodge, of this city, whose experience impressed him with the idea that we crush nine-tenths of our gold ores too fine in California, has been experimenting on the subject for some time. He thinks gold ore should not be crushed any finer than is necessary to pass through a No. 20 screen, and that if it is, loss is sure to ensue. Mr. Dodge has crushed some ore from Georgetown, El Dorado county, for Mr. P. J. Beardsley, passing it through a No. 20 screen, and afterwards concentrating it. This ore has been tested by Kustel & Riotte, at Mr. Beardsley's request. The ore assayed originally $15.07 per ton. Crushed through a 20 screen and concentrated, the concentration assayed $7,146 per ton. The tailings assayed only a *trace* of gold. Messrs. Kustel & Riotte say that several lots concentrated in the same way have given extraordinary results, similar to the above; and Mr. Beardsley verifies their statement. This is working ore very close.

Foreign Stump-Pulling on the Pacific Coast.—We read in an Eastern exchange that a company has been organized at Glasgow, Scotland, to go into the business of stump-pulling in Oregon and Washington Territory on a big scale. They will use a portable steam apparatus, which will, it is said, lift several trees a day bodily, by the roots.

A grand banquet was given at Paris, Sunday last, in honor of Nordenskjold, the Arctic explorer.

John Swinton declines the nomination for President tendered him by the National Labor party.

A NEW USE FOR THE POTATO.—A material that can be carved may be made out of peeled potatoes, which is prepared for this purpose by being first blackened for thirty-six hours in eight parts of sulphuric acid to one hundred of water; it is next dried with blotting paper, and then pressed. The French now manufacture pipes, in close imitation, it is said, of meerschaum, from this novel substance. A heavy pressnre gives a material so hard, that good billard balls, in imitation of ivory, can he made from it.

AN INGENIOUS DEVICE.—A window blind that can be converted into an awning has been long sought after, but it was reserved for the E. P. Pierce Manufacturing Company, 32 Hawley street, Boston, to solve the problem with their patent improved binges and fixtures. They now offer a unique arrangement for the immediate change of a closed and well-fastened blind into a perfect screen.

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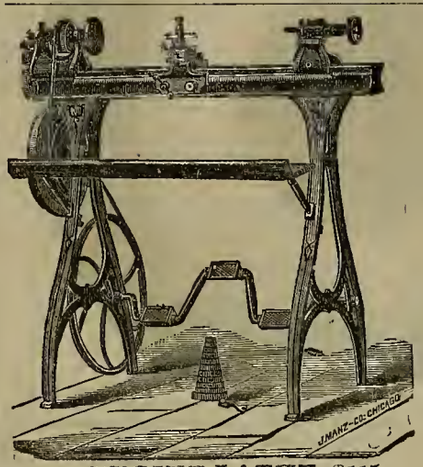

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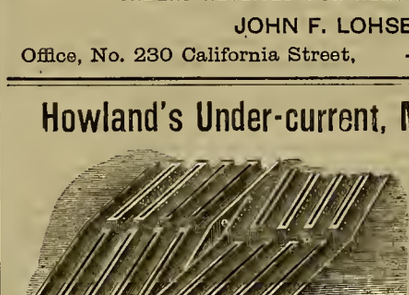

This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

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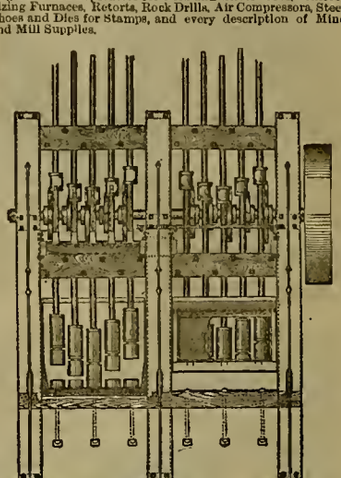

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A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Mecker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter.*

CONTINUED FROM PAGE 229.

double compartment working shaft is down 100 ft; ore taken out at bottom of the 100 ft shaft looks finer than any on the dump. At the Silver Nugget, the ore output of this mine has averaged for the last 10 days $1,000 a day. On the Golden Eagle, the vein at 160 ft in depth shows by actual measurement 16 ft 6 inches between walls. The hanging wall carries 8 inches of talc, and the foot wall 4 inches. Ore, whole width of ledge, averages and assays $45 in gold to the ton. The present developments have exposed fully 4,000 tons of ore.

HEAD CENTER.—Tombstone *Nugget*, April 1: Rich ore, carrying free gold and horn silver, seemingly in large bodies, has been taken out, which gave an average assay for the entire production of $250. The first level is in carbonate ore, and is drifting south 40 ft on its way to the old shaft, which, when completed, will be 190 feet. The second level is down 210 ft, from which there is a prospect out of 15 ft, which shows a ledge 6 ft it width, in which are free gold and horn silver, some the richest specimens we have ever seen in camp, and the vein matter shows up largely as the work advances.

EMPIRE.—Has upon its dump 150 tons of ore, which yields an average assay of $125 to the ton. The old shaft is down 200 ft, from which a level runs southerly on a gouge, and a crosscut runs east, which is now in 70 ft, all in ore, some of very high grade, and is improving every day as to quantity of rich ore. The new shaft is down 95 ft.

SILVER KING.—Tucson *Citizen*, Mar. 27: The working shaft is down 400 ft, but no ore is being taken from it at present. A Mr. Swain, of Oakland, has purchased the tailings from the Silver King mill, and will soon erect suitable machinery for working them. The "'76" mill has changed hands, passing into the possession of Eastern men. Superintendent Mason, of the Silver King, is erecting a $10,000 residence, which will be quite an ornament to the place. There are about 200 men at work on the Silver King.

DAKOTA.

HOMESTAKE.—*Black Hills Times*, Mar. 31: The mills of this company are now turning out over $200,000 a month, on the lowest grade rock they have. A body of ore has been struck in the lower level, and as soon as this remarkable mass of quartz is sufficiently exposed, the stamps will be fed on it, when the clean-ups of the Homestake will be $500,000 a month, instead of $200,000 as at present. It is confidently believed that the new ore body will yield from $20 to $40 per ton.

SNOW STORM.—The clean-up amounted to 370 ounces, which is 60% gold, from 10 tons of rock. They expected to make another clean-up of 400 ounces, after which the mill will shut down until the roads become passable for loaded teams.

ESMERALDA.—Has been working since Nov. 20th, and has turned out $30,000 in bullion. There is in this mine a body of ore 30 ft thick, that will mill $7 to the ton.

GALENA DISTRICT ITEMS.—The excitement created by the rich strike in the Cora still continues in that section. A large number of tunnels have been run into the mountain upon which the native silver ore was struck, and in every one mineral has been found. This veiu seems to extend the whole length of the hill. The Washington mine, the most extensively developed on the new belt, has a vertical vein of this rich rock, while the ledge in the Cora and others is flat, but pitching.

IDAHO.

IDAHO SPRINGS.—*Iris*, Mar. 20: The property of this company consists of 11 lodes, to be developed by a crosscut tunnel, which will intersect them in the following order: Althea, Little Etta, Bulger, Manchester, Cleopatra, Underwood, Alma Brooks, Helen Bassett, Garoo, Winning Horse and Gilbert. The shaft on the Little Etta is 10 ft deep, and the crevice matter for a width of 3 ft gives a return of $50 per ton, selected specimens averaging as high as $300. A 30-ft shaft on the Manchester shows 10 inches of galena, worth $80 per ton. The Cleopatra shows about 16 inches of ore, assaying $210. The Bulger carries an 8 or 10-inch vein of decomposed ore, which yielded $50 per ton in gold from the grass roots. These mines are situated in Spring gulch, a tributary of Chicago creek, 3½ miles from town.

CHARLES DICKENS.—The second tunnel is in 160 ft. It is being run on the ledge, which is 12 ft wide. The width and richness of the veiu is greater than in the level above. A contract was let for the running of a tunnel still lower. It is now in 250 ft, and will tap the mine at a great depth. A large quantity of high-grade ore is being taken out, and the arastra will be kept constantly running as soon as spring opens.

CUSTER.—There is sufficient ore to justify the erection of a large mill, which is being built in San Francisco. Enough ore to keep the mill running a long time is in sight.

News in Brief.

THE Anglo-American cable is broken.

WEINAWSKI, the great violinist, is dead.

BATOUM is being converted into a Russian stronghold.

SECRETARY SHERMAN declines an invitation to visit Boston.

A CHICAGO dispatch announces the opening of lake navigation.

GLADSTONE is elected to the British Parliamont by 200 majority.

ABOUT 300 painters in St. Louis have struck for an increase of wages.

THE King of Abyssinia is marching against King Menelek, of Thoa.

MASIERSON, who escaped from the Ukiab jail, has been recaptured.

GEN. JOE LANE is a Democratic candidate for the Oregon State Senate.

THE mining excitement in southern Arizona is growing greater every day.

SEVERAL washouts have occurred on the railroad between Ione and Galt.

THE track of the Southern Pacific railroad is now laid 21 miles east of Tucson.

AN excursion party numbering 200 will leave Boston on the 12th inst. for California.

THE Chilean ironclad *Huascar* has been bombarding Arica, Peru, three hours daily.

CHINESE troops have crossed the eastern Russian frontier at Assuri, south of Amoor.

THE Nebraska Democrats bave elected Tilden delegates to the Cincinnati Convention.

A DIVIDEND of 1¾% has been declared by the Chicago, Burlingtou aud Quincy Railroad Company.

SILVER in London is quoted at 52½d; consols, 98 5-16; 5% U. S. bonds, 105½; 4s, 109⅜; 4½s, 112½.

APRIL 26th is the date set for fixing a new day for the execution of Sprague in Ventura county.

SEVERAL plantations have been inundated by a break in the levee on the lower Mississippi river.

AN Apacho band recently attacked the village of San Jose, N. M., but were driven off by soldiers and Mexicans.

Mining Partnerships and Abandonment of Claims.

The Weske Gravel Mining Decision.

A very important mining decision was this week rendered by Judge Daingerfield, of the Superior Court, in the cases of Leet vs. Weske, and Leet vs. the Weske Gravel mining company. The actions were brought in the Old Twelfth District Court, in 1873, and they involved the ownership of a very rich gravel mining claim at Turkey Hill, Placer county, covering 160 acres. Judgment was given for the defendants.

The following is the full text of the decision:

Theso two cases are submitted together, and involve the determination of the same question, to-wit: whether the plaintiffs and intervenors have any rights to certain mining claims known as the Washington mining company's claims in Placer county, near Michigan Bluffs. If so, plaintiffs claim an accounting for the rents and profits, and a decree that defendants hold in trust for plaintiffs. The evidence shows that, in 1861, the original locators of the said mine, being a company of some eight men, had located and unsuccessfully worked the Washington mining claims, having been associated as a company from 1857 or 1858.

In the year 1861, the company mutually agreed to separate and leave the claim, saying "that it would not pay," and some saying that they "abandoned" the claim. They left their tools and mining implements, and departed, each going where he thought was most to his own interest. But one Drury, an original locator of the claim, remained in the company's cabin, and, by permission of some members of the company, worked in the moutb of the tunnel and "creviced," and used a rocker in taking out gold to support himself.

Weske was working in an adjoining claim, and in 1863, at the latest, took possession of the land in dispute, and openly used the same, employing from ten to twenty men daily in developing the mine. In the year 1870, or thereabouts, it was discovered that the mine was paying liberally, and then the plaintiff herein asserted a claim to an interest in the rich mining ground, which is the subject of this action.

He claims that one Drury occupied the land, and held it under a permit from him, and that thus his title was kept good for the six or eight years during which Weske was in the open, notorious, adverse possession, as claimed by him. The evidence shows that Leet purchased an interest in the property after the year 1861, for an overdue debt, and he says that he took possession under a bill of sale from one of the original locators. What he did, as sworn to by himself, was to go on the ground and take a little gold from the mouth of the old tunnel, and tell one of the original locators that he had bought an interest, and claimed a joint possession witb him.

The claim was a tunnel claim, and was so taken and held, and has been so worked, and not otherwise, and, in my opinion, no such occupation for a few hours, as Leet testified to, on his part would bo considered as possession at all. He never worked a day thereon afterward, never paid or tendered to Weske anything until the bringing of this suit, and although he preteuded to be the owner of an interest in the claim where Weske was working openly and notoriously, and claiming the mine as bis own for more than seven years, Weske never was informed of Leet's claim, until after the mine thus developed by him was a noted success.

The dissolution of tbe partnership, in my opinion, was complete in 1861, and if any one held thereafter, be held by actual, personal possession, as an individual, and not as a tenant in common or partner. The partners have never come together or asserted any rigbts to this mine since 1861, and at no time has more than one of them been near the claim, and then not to claim it as a partnership venture. In the case of Wariug vs. Crow, 11 *Cal. Repts*, tried before me in Shasta county, I held that the possession of one tenant in common of a mining claim was the possession of all, and the Supreme Court affirmed that decision and extended it to general partnersbips also. That was a living partnership, however, where all but *one* remained and worked, and tbat one went off, and on his return brought that suit to be put in possession; but it would be folly to hold that a single person remaining in possession *after partnership was dissolved* could hold for the *non-existing* body. The person remaining could only bold by new acquisition for *himself*. Tbus Leet's grantor, if he ever held any interest, only held a personal one by new appropriation, and only wbat he personally appropriated. There is no proof as to what this was. But before Leet acquired any interest to anything, Weske had a title by adverse occupation. It is claimed that Weske cannot dispute the original title, because he bolds the deed from one of tbe original claimants in the Washington mine. I do not so understand the law. At the time he took his deed from the original locator, or claimant, *his title* had become perfect by adverse use and occupancy, and under those circumstances he cannot be held as claiming under tbat title, but must be considered as buying an adverse claim, worthless in itself, perhaps, for the sake of peace.

Weske has been holding this property for several years under a patent from the United States. If Leet was a tenant in common in that land, he holds, in my opinion, for Leet; but I cannot find that Leet ever had acqnired, either by purcbase or possession, any interest in the land claimed.

Again, if Lect ever had a title to tbis mining ground, his claim was stale long before this suit was brought.

The rule is that an equity, such as is sought to be here enforced, must be speedily presented and an offer made to do equity by promptly contributing to the expense of the enterprise. If he knew that Weske was working 15 or 20 men a day, at an enormous expense, for six years and over, and did not offer in the night of adversity to relieve him of a portion of these expenses, it would seem unjust to permit him now to say, "You may keep all the money you made, after paying me what I did not help accumulate." He should have *promptly* contributed and been willing to share the losses before a court of equity would divide the profits with him. Before the acquisition of a Federal title to mining land, I know of no otber way of acquiring such property than by actual possession, or by claim under mining rules and regulations. No such rules are shown to have existed in this locality. Possession alone governed until Weske acqnired his patent thereto.

He holds, therefore, under actual continued possession, and by working on his claim for more than six years, adversely and notoriously claiming it as his own.

Leet does not and cannot hold it because it was abandoned before he pretends to have bought it, and because he has never done any substantial work upon it.

Weske holds it nnder a patent from the United States, and a judgment must therefore be entered in favor of defendants in both actions.

This case has occupied a great deal of timo, both before my immediate predecessor and myself, and on account of its very great importance financially I have thought it proper to give my views at greater length than the questions involved would warrant. The question of fact above decided was not solved in the same manner by my predecessor that I have decided it, but the proofs were different, and many additional facts were proven before me that were not before him, and there is no necessary conflict between us. Months have been spent in taking testimony, tens of thousand of dollars have been paid out in this litigation, and I sincerely hope that in this decision the law has been fairly anuounced and the facts set out. It is well that there should be an end of litigation, and I hope that such end is now reached.

Mining Maps.

Since the "mining boom" began to spread so widely, the literature of mining has increased, and many journals which never before paid any attentiou to the subject, are now publishing a mining column. A great many new mining maps are also being published, and we have received several this week.

The "Pocket Mining Atlas," compiled by Edwin Bolitho, of 27 Park place, New York, is a very handsome little publication, neatly bound in morocco. It has colored lithograph maps, on small scale, of the mining districts of Georgia and Michigan, of Deadwood district, Dakota, 6 districts in Colorado, 6 in Nevada; a map of Utah, Idaho, Montana, New Mexico and Arizona; also, one of Bodie district, California. It is the neatest publication of the kind we have ever seen, and very useful for mining men. Price, $1 per copy. The maps show signs of accuracy and care in their compilation.

R. T. Sorin, of Tucson, Arizona, has published a pocket companion, for prospector, investor and tourist, of the mineral fields of southern Arizona. It gives all tbe mining districts within 100 miles of Tucson, the supply depot of the camps of southern Arizona and Utah. Circular lines represent 25, 50, 75 and 100 miles distance air line.

Bancroft & Co., 721 Market street, in this city, have sent us a very handsome "Official map of the Territory of Arizona.

The map, constructed on a scale sufficiently large to admit every detail, exhibits the entire hydrographic system and the topography in clear relief, altitudes according to accepted authorities, public surveys (townships) as far as run; location of towns, settlements, ranches, mines, mining camps, mills, postoffices, all roads and stations, telegraph lines and offices, military and Indian reservations, pueblos, etc. Especial attention has been given to the location of mines and mining districts, the boundaries of which, together with county and reservation lines, are distinguished by appropriate coloring.

To enhance tbe utility of the work, an entirely new and important feature has been added: Along the several roads and between "stations," or other prominent points, the distances in miles and fractions are distinctly printed, converting the map into a graphic itinerary, more comprehensive and useful than the most elaborate classification in its usual form—an advantage which every traveler will readily appreciate. The map has been compiled by Eckhoff & Riecker, civil engineers. Pocket size on paper sold for $3, and on linen and roller, $5. Tbis is tbe best map of Arizona yet published and contains all the latest information.

"The Californian."

"Tbe *Californian*, a Western Monthly Magazine," published by "The A. Roman Publishing Co.," San Francisco, although only four numbers have been issued, has met with a hearty reception by an appreciative public. The following table of contents of the April number will give to those who have not seen the magazine, a good idea of its scope.

Sand, Chapter IV.....J. W. Gally.
The Story of Australia and New Zealand..R. E. Desmond.
The Hermit of Treasure Peaks.....Sam Davis.
Pallas.....Chas. H. Phelps.
Shepherds and Sheep-Herding, II..Robert Duncan Milne.
At Agua Tibia.....Agnes M. Manning.
Americanism in Literature.....Edgar Fawcett.
Captain Molly.....E. W. Ludlum.
The Ethics of Suicide.....Albert Williams.
Our Ophidian Friend.....John Vance Cheney.
Notable Autographs.....Fourquci.
Ruby.....J. H. S. Bugela.
Arizona.....James Wyatt Oates.
A Glimpse of the Unusual.....W. C. Morrow.
Outcroppings—"About Pets," "Waiting for the Galleon," "Pencil Shavings," "Ike gives his Opinion on Total Depravity," "A Stroll Through Chinatown," "Elsie," "The Voice of the Sea," "Under the Smilax," "A Vaquero's Love Song," "Winter Rain."

This able California magazine should receive the support of the literary community of the Pacific States in the most libcral manner.

THE freight-handlers of the Cbicago, Milwaukee and St. Paul railroad at Chicago bave struck for an advance of wages.

SHEEP and hogs are perishing by the score in upper Willamette valley, Oregon, under the effects of the late severe weather.

Meteorological Summary for the Month of March, 1880.

Station, San Francisco, Cal.

Date	Mean Daily Barom.	Daily Mean Temp.	Daily Mean Humid'y.	Prevailing Direction of Wind.	Daily Rain-fall.
1.....	30.048	49.50	88.0	SW	....
2.....	29.959	48.25	71.0	W	.09
3.....	29.898	45.75	75.3	SW	.58
4.....	30.232	44.25	67.3	W	....
5.....	30.242	47.00	66.7	N	....
6.....	30.225	49.50	79.7	W	....
7.....	30.239	49.00	89.3	W	....
8.....	30.045	51.50	46.3	NW	....
9.....	30.075	55.75	42.3	N	....
10.....	30.021	55.50	58.0	W	....
11.....	29.908	49.25	86.3	SW	....
12.....	30.000	47.75	27.3	N	....
13.....	30.054	46.50	40.7	NW	....
14.....	30.099	47.50	31.7	N	....
15.....	30.045	46.75	70.3	SE	....
16.....	29.945	47.75	71.0	W	....
17.....	30.003	47.50	82.7	NW	.38
18.....	30.261	47.50	76.7	W	....
19.....	30.201	49.50	81.7	W	....
20.....	30.262	49.50	82.7	W	....
21.....	30.245	50.50	78.0	W	....
22.....	30.088	48.25	84.3	W	....
23.....	30.003	50.50	76.3	SW	....
24.....	29.839	48.75	80.7	S	.23
25.....	30.065	49.50	79.7	W	.15
20.....	30.353	49.50	06.0	SW	....
27.....	30.080	51.00	85.7	S	.09
28.....	30.125	47.25	09.3	W	.53
29.....	30.265	46.25	65.7	NW	. —
30.....	30.236	47.25	58.7	NW	....
31.....	30.105	53.00	84.0	S	.03
Sums...	933.441	1,514.25	2,163.4	....	2.08
Means..	30.111	48.85	09.79	W	....

NELSON GOROM, Serg't Signal Corps, U. S. A.

HALL'S VEGETABLE SICILIAN HAIR RENEWER is a scientific combination of some of the most powerful restorative agents in the vegetable kingdom. It restores gray hair to its original color. It makes the scalp white and clean. It cures dandruff and humors, and falling out of the hair. It furnishes the nutritive principle by which the hair is nourished and supported. It makes tho hair moist, soft and glossy, and is unsurpassed as a bair dressing. It is the most economical preparation ever offered to the public, as its effects remain a long time, making only an occasional application necessary. It is recommended and used by eminent medical men, and officially endorsed by the State Assayer of Massachusetts. The popularity of Hall's Hair Renewer has increased with the test of many years, both in this country and in foreign lands, and it is now known and used in all the civilized countries of the world.

FOR SALE BY ALL DEALERS.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure propor credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of otbers.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco.

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[Corrected Weekly by SUTRO & Co.]
SAN FRANCISCO, April 7, 3 P. M.

SILVER, ½.
GOLD BARS, 890@910. SILVER BARS, 10@18 ⅜ cent. discount.
EXCHANGE on New York, 25, on London bankers, 49½@49¾, Commercial, 50; Paris, five francs ⅜ dollar; Mexican dollars, 90@92.
LONDON Consols, 98 5-16; Bonds (4%), 109½
QUICKSILVER in S. F., by the flask, ⅜ lb, 42½@45c.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Consolidated Pacific Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Bodie Mining District, Bodie, Mono County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the Thirteenth day of March, 1880, an assessment (No. 1), of One Dollar per share was levied upon the capital stock of the corporation, payable immediately in lawful money of the United States, to the Secretary, at the office of the Company, 330 Pine st., room 5, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Sixteenth day of April, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the Eighth day of May, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. F. E LUTY, Secretary.

Office—No. 330 Pine street, room 5, San Francisco, Cal.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Eighth day of March, 1880, an assessment (No. 41) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twelfth day of April, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the Third day of May, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) levied on the 14th day of January, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
J R Robbins, Trustee	17	68	6 80
J R Robbins, Trustee	61	1000	100 00
A Hinds	57	1000	100 00
J K Cooper, Trustee	106	100	10 00
T L Bibbins, Trustee	99	100	10 00
T L Bibbins, Trustee	100	100	10 00
T L Bibbins, Trustee	103	50	5 00
T L Bibbins, Trustee	136	1000	100 00
T L Bibbins, Trustee	112	450	45 00
T L Bibbins, Trustee	148	50	5 00
T L Bibbins, Trustee	156	500	50 00
T L Bibbins, Trustee	157	100	10 00
T L Bibbins, Trustee	163	100	10 00
T L Bibbins, Trustee	176	50	5 00
T L Bibbins, Trustee	213	100	10 00
T L Bibbins, Trustee	229	100	10 00
T L Bibbins, Trustee	231	100	10 00
T L Bibbins, Trustee	254	20	2 00
T L Bibbins, Trustee	436	1000	100 00
M French, Trustee	346	1000	100 00
H R Taylor, Trustee	340	50	5 00
J Griswold, Trustee	441	6900	690 00
Unknown	251	65	6 50
Unknown	253	30	3 00
Unknown	250	42	4 20
W Townsend, Trustee	410	1000	100 00
W Townsend, Trustee	411	500	50 00
W Townsend, Trustee	412	500	50 00
T A Wright, Trustee	309	1000	100 00
J R Robbins	257	20	2 00
G L Waters, Trustee	419	200	20 00
W J Gwynn	402	1000	100 00
M K Lauden, Trustee	390	1000	100 00
M K Lauden, Trustee	391	1000	100 00
M K Lauden, Trustee	392	1000	100 00
M K Lauden, Trustee	393	1000	100 00
M K Lauden, Trustee	394	1000	100 00
E A Richardson, Trustee	315	500	50 00
E A Richardson, Trustee	316	500	50 00
E A Richardson, Trustee	317	500	50 00
E A Richardson, Trustee	318	500	50 00
E A Richardson, Trustee	319	500	50 00
E A Richardson, Trustee	320	500	50 00
E A Richardson, Trustee	321	500	50 00
E A Richardson, Trustee	322	500	50 00
E A Richardson, Trustee	323	500	50 00
E A Richardson, Trustee	324	500	50 00
E A Richardson, Trustee	325	500	50 00
E A Richardson, Trustee	326	500	50 00
E A Richardson, Trustee	327	500	50 00
E A Richardson, Trustee	328	500	50 00
E A Richardson, Trustee	329	500	50 00
E A Richardson, Trustee	330	500	50 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 314 Bush street, San Francisco, on Thursday, the 11th day of March, 1880, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

T. L. BIBBINS, Secretary.

Office—314 Bush street, San Francisco, California.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Thursday, the 25th day of March, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Tuesday, the 20th day of April, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

San Francisco, April 2, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 14, of

SEVENTY-FIVE (75) CENTS PER SHARE

Was declared, payable on Monday, April 12th, 1880, at the office in this city, or at the Agency of the Nevada Bank of San Francisco, in New York.

WM. WILLIS, Secretary.

Office—Room No. 29 Nevada Block, No. 300 Montgomery street, San Francisco, Cal.

ANNUAL MEETING.

NOTICE.—The Annual Meeting of the stockholders of the BRILLIANT MINING COMPANY, for the election of officers to serve for the ensuing year and for the transaction of such other business as may properly come before it, will be held on Wednesday, the 21st day of April, 1880, (third Wednesday in April), at 2 o'clock P. M., at the office of the Company, room 4, 309 California Street, San Francisco, California.

J. M BUFFINGTON, Secretary.

Office—Room 4, No. 309 California Street, San Francisco, California.

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EXTRA QUALITY ENDLESS BELTS,
STEAM AND SUCTION HOSE,
AIR, OIL AND BREWERS' HOSE,
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SUCCESSOR TO
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PRINCIPAL OFFICE:
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All ordinary mending, sewing on buttons, etc., free of charge. Orders left at the office will receive prompt attention. Work called for and delivered to any part of the city free of charge.

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THE OFFICE OF THE
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Shafting, Hangers, Pulleys, etc. Electrical and Experimental Machinery. Printers' Jobbing a Specialty. Patent Office Models. Special Tools and Fine Machine Work made to order.

Notice! Important to Miners!
An important Machine called the
DRY GOLD SEPARATOR
Has been invented and can be seen at No. 5 Beale St., S. F. Arrangements have been made to manufacture in quantities to suit the demand. Machines weigh from 200 to 300 lbs. Price, $80 to $150. They run 10 to 20 tons of gold-bearing earth through per day, thoroughly separating the precious metals from the earth. Several are at work in Arizona and Mexico. A guarantee with each machine. Call and see sample at No. 5 Beale street, near Market, San Francisco.

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Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

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SAVE YOUR GOLD!
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SILVER PLATED AMALGAMATING PLATES.
The most economical and successful process now in use. Will warrant my Plates to save a very much larger percentage of gold than any other method. Thousands of orders filled and the demand constantly increasing. Having very extensive facilities for the manufacture of these Plates, will fill orders for California, Colorado, Montana, Dakota, Oregon, Idaho, Utah and adjoining States at prices which defy competition. Metal Goods of every description, including Musical Instruments used by Brass Bands, plated.
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Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

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Flouring Mills, Saw Mills and Quartz Mills Machinery constructed, fitted up and repaired.

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Manufacturers of all kinds of

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ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Ruddar Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

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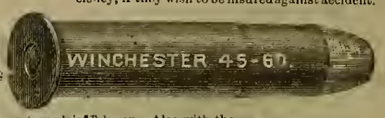

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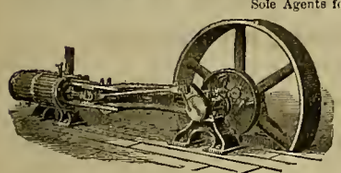

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IS FITTED UP WITH

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The Pulverizer requires about one-third the power usually expended for the reduction of the same amount of Ore by Stamps.

Price List, Etc., of the White Rotary Pulverizer.

No.	Tons Per Hour.	Inches Diameter.	Revolutions Per Minute.	Horse Power Required.	Shipping Weight.	Lumber Required.	Price.
1	6	56	600	40	12	6,000 ft.	$5,000
2	10	72	470	60	15	9,000 "	8,000
3	16	84	400	75	20	12,000 "	10,000

The Repairs on the Pulverizer will not exceed those of a 10-Stamp Battery.

The Shipping Weight of the entire apparatus is not one-eighth of that of Stamp-Mortars required to do an equal amount of work. It can be placed and put running at the Mill in from fifteen to twenty days.

Address GEO. W. WHITE, Inventor.

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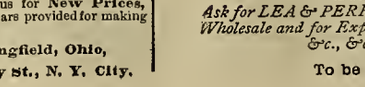

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Double Engines with Single Reels. Single Engines with Single Reels. Reels from 3 ft. to 5 ft. in diameter. Our Engines are in use n most of the mines on this coast

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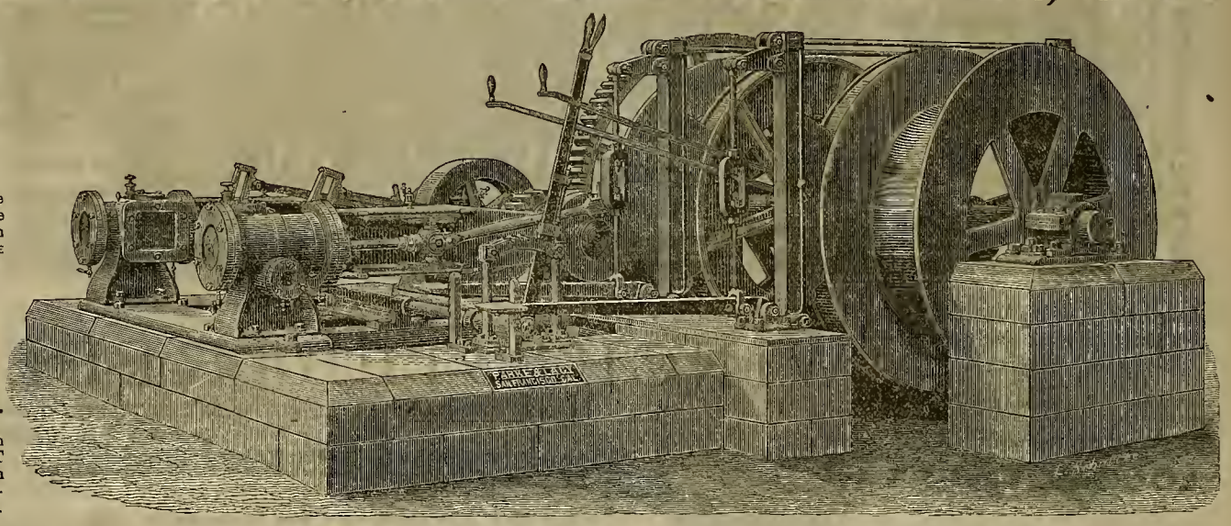
Any style of Boiler supplied with Engines. These Engines have CUT GEARING, which makes them very desirable, as they run noiseless. From 25 to 100 horse power.



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MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS

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Stronger, Better and Safer than any other High Explosive

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IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.

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The Strongest, Safest, Most Uniform and Reliable "HIGH EXPLOSIVE" Manufactured on the Coast.

MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

We call the attention of all desiring such a Powder to our various grades, which are prepared to sell at LOWEST RATES.

No. 1.—Equalling Liquid Nitro-Glycerine in Strength. We recommend this Grade in extremely hard rock, boulders, iron, etc.

No. 2.—Will do the work thoroughly in all but the hardest kinds of rock.

No. 3.—For bench work, pipe-clay, soft and shelly rock, outside work and quarrying.

Single and Triple Force Caps, Fuse of all Grades, Vulcan Powder Thawing Boxes, Batteries and Exploders, For Sale at the Lowest Rates.

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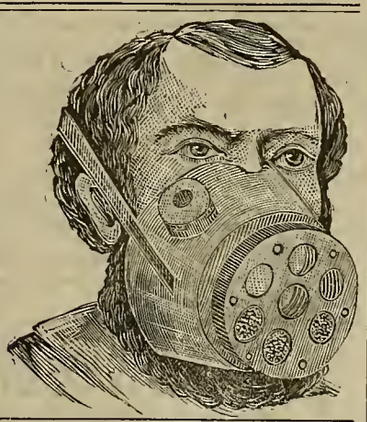
LIFE-SAVING RESPIRATOR

Prevents Lead Poisoning and Salivation.



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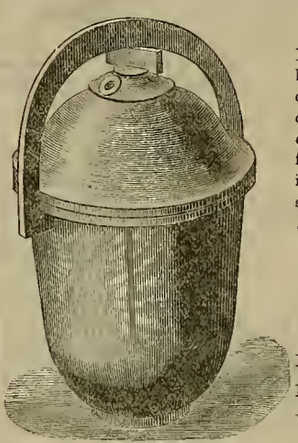
THE NEVADA OVAL TOP RETORT.



The advantage of this Retort over the OLD FLAT PATTERN is, that it can be filled full of Amalgam, thereby holding more than the old style, besides avoiding all danger of an explosion owing to the crown space in the cover which allows for the expansion. They are made extra heavy, WELL GROUND in the joints, and are furnished with a strong Norway clamp, having a wrought iron key which can be driven in or out of place hy a single stroke of a hammer.

The Annoying Thumb Screw is Entirely done away with.

We Make Seven Sizes, as follows:

Number or Pints.....	1	2	3	4	5	6	10
Holds Ponnds Quicksilver	12½	25	38	50	63	75	125
Weight each.....	10 lbs	15	18	25	31	44	65

Mortars and Pestles,

GROUND INSIDE.

Size—Quarts....	½	1	2	4	6	8	12	16
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Weight—Pounds	6½	9	16	22	37	43	72	86

Bullion Ladle.

Forged from one piece of Charcoal Iron, eight inches in diameter hy four inches deep.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 17, 1880.

VOLUME XL Number 16.

California Shipping Copper to the East.

We saw, a day or two since, about 16 tons of ingot copper, 98 fine, which was awaiting shipment to the Eastern refineries. It was produced at the mine of the S. F. copper mining company, which is situated in Nevada county, Cal., on a branch of the C. P. R. R., 12 miles from Wheatland.

During 1879, the mine turned out 6,000 tons of copper similar to the above, and also 512,128 pounds cement, or precipitate copper. The capacity of the work is 60 tons per day.

This is only one of the productive copper mines upon this coast. There are others which are producing copper for shipment. There are hundreds of copper mines that are not worked, but which would be if refineries were established, where the ore could be readily received, or the mats of copper find purchasers.

Here is one of a great many industries that are lying dormant and unproductive among us because there are no facilities for rendering their products marketable. In this case, the copper has to be shipped to the Eastern States in sailing vessels, costing no small item for transportation from the mines to the seaboard, and shipment thence to the Atlantic or European ports, there to be refined, rolled into sheets, bars and rods, made into rivets, bolts and nails, and reshipped back to our own doors, and, in some of its forms, taken back to the very mines which produced the copper, to be used there. All the time occupied in the double transit is so much time lost, is so much of a burthen that the mines must bear, to which must be added the cost entailed by the transportation. This is a heavy though indirect tax upon this great industry.

The PRESS was the first paper published on this coast to call attention to the necessity of having rolling mills and refineries established here to aid in the development of new mines. It demonstrated the fact that it would not only be better for the money expended in transportation, refining, rolling, and manufacturing the copper produced here, retained and paid out among our own laborers. It proved that there would be a fair margin of profit to those who might invest in the establishment of such works here, provided the present producing mines kept at work and new ones were opened. It also proved, what is necessary to ascertain before embarking in the enterprise, that ample supplies of copper can be obtained here, and, with the renewed facilities that such works would afford for rendering the copper marketable, there would be an inducement and an incitive for the now dormant mines to spring into renewed activity. It would also have the tendency to open new mines, and, by its genial influence, render our copper exports an item of great value.

We are pleased to learn that the matter is being agitated in monied circles, and that capital is now ready for the starting of such an operation as soon as the requisite talent and practical experience can be obtained to supervise the erection of suitable buildings, and the construction of the needed furnaces and machinery, combined with the requisite skill for conducting the manipulations of the crude material, which consist of ores, matte ingots and precipitats, until the refined copper is produced.

With the commencement of the operations of a capacious refinery and rolling works, would dawn upon the copper mining interest a brilliant epoch. Activity and enterprise would be awakened, and labor find a new and extensive field for its employment. We hope in the near future to be able to give definite information of the initiative steps having been taken in this direction.

TOMBSTONE district, Arizona, is now shipping from $5,000 to $8,000 worth of bullion per day, and it is expected that it will reach $10,000 per day as soon as the new mills get in thorough working order. Last week $52,000 was received in Tucson from Tombstone district.

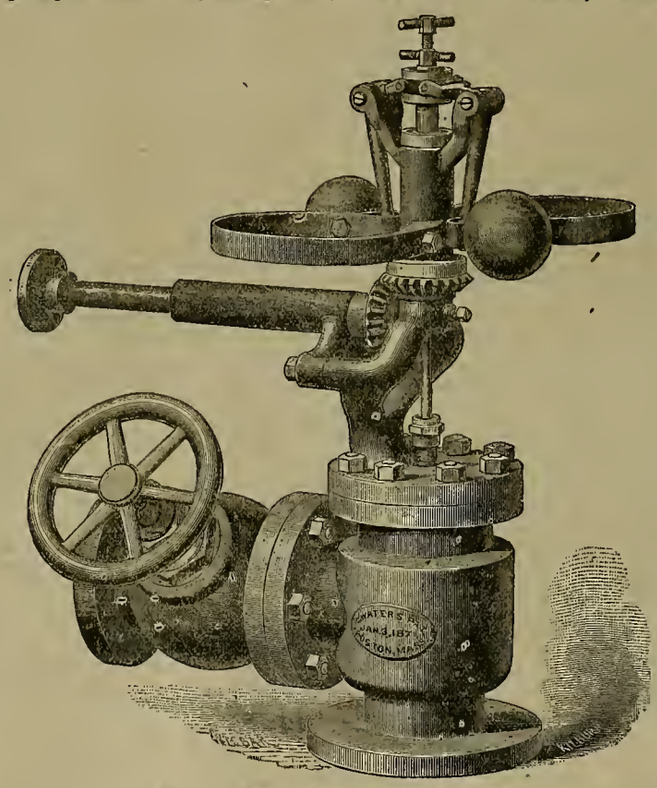
A REVENUE cutter is to be fitted out immediately to go to the relief of the exploring ship *Jeannette* and the whaling vessels, supposed to be frozen-in somewhere this side of Wrangel Land.

The Hydraulic and Drift Mines.

The recent advent of warm weather having cleared the ditches of the snow and ice, that had so long obstructed them, gravel washing has been started up along the entire hydraulic belt, or, at least, as far north as Brandy City, at which locality piping is in active progress. The incoming season will, it is thought, be a prosperous one with this class of miners, notwithstanding the months of February and March have this year been wholly lost to them. This loss, it is hoped, will be in good part made up through an abundance of water and the excellent condition in which the miners had placed their claims prior to the coming of the winter rains. Never before had this preparatory sort of work been done with such thoroughness as during the past autumn, to say nothing of the advance that this branch of mining has every year made through the introduction of improved gravel-washing and gold-saving appliances, the gains secured thereby amounting of late years to 10% or 15% annually. Not only have greater efficiency and economy in the working of the gravel been secured, but almost equal benefits have of late accrued to the hydraulic miner through the employment of machine drills for driving the long bedrock tunnels, so often required for opening up his claims. Then, too, the productive capabilities of this class of mines have, through increased water supplies, met with steady and material enlargement.

Wherever we look along the path of this industry, as it leads from Placer across Nevada into Sierra county, these evidences of progress and improvement are noticeable. At Gold Run on the south, and Brandy City on the north, as well as at all intermediate points of importance, the effects of this onward movement are apparent. The Gold Run ditch and mining company have for ten consecutive years disbursed all their net earnings in betterments on their estate. After all these years of careful planning, persevering effort and large expenditure, this company has at last succeeded in so far perfecting their grand scheme of improvement as to have greatly increased the productive capacity of their property, which, when that system shall have reached final completion, will stand second to none in California as regards gross production, net revenues and intrinsic value. At Dutch Flat, Liberty Hill and You Bet, and further on at Blue Tent, Brandy City and North Bloomfield, a like purpose is being worked out through the improvements undertaken and now being prosecuted by the several companies owning mines, ditches, etc., at these places.

Drift mining along this belt is being actively and successfully carried on at Gold Run, at Liberty Hill, at various localities on Chalk Bluff ridge, about Moore's Flat, at Allegheny, Forest City, and along Slate Creek, and also to a greater or less extent at many intermediate points. At Liberty Hill and Chalk Bluff drift mining will be especially active this season, the rich strikes that are constantly occurring at these localities tending to encourage prospecting and greatly promote this branch of mining.



THE WATERS "PERFECT" GOVERNOR.

DECOMPOSING THE ELEMENTS.—That eminent physicist, Raoul Pictet, who a year or two ago first liquified and then solidified the subtle hydrogen gas into shining metallic specks, has conceived the idea of decomposing some of those chemical elements which chemists have for a long time thought to be compound. Pictet proposes to begin with bromine, and he will use heat as the decomposing agent. As the heat of the electric current, which scarcely reaches 7,000 degrees is insufficient, he proposes to use solar heat. This he will accomplish by employing a number of concave mirrors, each having an area of one square meter. Enough of these mirrors will be used to attain a temperature of 20,000 degrees. The gaseous products will be drawn through a lime tube surrounded by a freezing mixture of 350° temperature. This will prevent the component parts from again combining chemically, should bromine prove to be a compound substance instead of an element.

The Waters Governor.

We illustrate herewith the "Waters Perfect Governor," for which Parke & Lacy, Nos. 21 and 23 Fremont street, in this city, are agents for the Pacific coast. The governor is supported on a frame of novel design which also closes the opening in upper end of valve chamber. The peculiar shape of this frame admits of easy access to stuffing-box, bolts, etc., even in the smallest sizes. Into this frame is fastened by a set screw a stud, which supports the casting composing the governor proper, and which is made to revolve around the stud. This casting is provided at top with proper care to receive the joints of the arms which revolve with it, and at the lower end with two projections to which are bolted one end of a steel spring. The free end of this spring is formed into a slot, and also of such shape as to receive the ball, which is secured to the spring by bolts. One end of the arm is formed into a small ball, and fits loosely into the slot of spring; the other end of arm carries a piece of hardened steel which works in a grooved composition collar, fitted to move up and down in the central stud. The valve stem is screwed through this collar, and communicates motion directly to the valve. The balls being supported and rotated by the springs, all friction is taken off the joints of arms, and the balls do not rise and fall by the rotation of the arm around its pivot, the slot in spring compensating for all difference in motion. The end of the valve stem is extended through the top of composition collar, and furnished with a handle, with which to turn it, and a check nut to hold it in place. Screwing this stem down causes the engine to run slower; screwing it up causes it to run faster. The check nut holds it wherever wanted. The bearing of horizontal shaft is bolted to the frame, and if broken off by accident, can be easily and cheaply replaced without damage to other parts of the governor. All bearings are made of babbitt metal, and all parts are duplicate.

The theory embodied in the construction of this valve is, to relieve the joints of the ball arms or levers from all friction, and also the weight of the ball; to have the balls always revolve in the same plane without rising or falling, the force usually supplied by gravity being furnished by springs, which also sustain the weight of the balls. Having a valve of large area insures the highest economy consistent with the use of plain engines, and also the nearest to perfection in regulating; the use of comparatively light balls, springs, and a medium high speed, all tend to correct results in regulation, especially if combined with large valves. The valves are, practically, indestructible. Being made of composition, they will neither rust nor corrode, and they are claimed to be proof against the action of what is called steam-cut, which quickly renders a governor worse than useless. The ready means of adjusting the speed of the engine is another great convenience, the range of variation being as high as seventy-five per cent. This governor is especially adapted to very small engines also. Being unusually quick in its action, it is remarkably adapted to sawmills, rolling-mills, and all places where the changes are sudden and severe. It is claimed that with this governor an engine can be made to do its work with very low boiler pressure, as the large opening to the valves does not throttle the steam in time of need, and it enters the cylinder nearly at boiler pressure.

WE see by the Nevada City *Transcript* that quartz prospectors have been more successful in that district for six months past, than during any previous winter for several years. A number of miners who have hitherto confined all their attention to explorations in gravel have forsaken that business and begun looking for ore deposits with encouraging results. Several of the newly discovered properties are being negotiated for by capitalists and agents now stopping in the city, and with every prospect of bargains being effected soon.

PETITIONS against the proposed new mining laws are being circulated in many of the mining districts of this and adjoining States and Territories.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Side Lines of Mining Claims.

Editors Press:—The eubject of broad or narrow eide lines, involvee a qnestion of vast importance to mining interests, that should have been settled long ago. There are many opinions on this qnestion, but I now think ninety per cent. of the facts and arguments are on the side of broad side lines. That I have not alwaye thought so, and have gradually been forced to thie conclueion from facts in the actual development of mines, satisfies me the more that I am right. I will briefly state the only reasons used to advocate narrow side lines. They are, first, that when a patent is obtained, you pay for a minimum number of acres, and they are all you need. Second, that with the full side linee allowed by the law of May 10, 1872, to-wit, 300 feet on each side from the center of the lode, a few claims cover a whole district. These two reasons embrace all that can be said, of any force, in favor of the one hundred-foot side lines etill claimed in perhaps a majority of the districts.

Now, the facts against the above reasons are, first, the narrow side linee seldom embrace the croppings of the vein, if a large one, hardly ever when it lies along the trend or face of a mountain, and never, when it crope along the backbone of a sharp ridge.

I now speak of lodes in northern Utah, at elevations of from 6,000 to 10,000 feet. In these cases, the croppings shoot out to the surface through the broken debris that covers the mountain side, sometimes in nearly horizontal lines, making their appearance on the surface hundrede of feet from the main lode. Suppose several of these have been taken up; a conflict of title ensues; the purchaser must buy them all to dispel the clond on the title. The miner wants enough side line to cover all the croppinge of hie vein, so that he may have the benefit of all the title to his lode. The law of May 10, 1872, is good enough. I would amend it in this only: make it compulsory, and prohibit the districts from cutting down the side lines. This is in the true intereets of the miner and capitalist alike.

"Why, then, do eo many districts reduce the side lines to a minimum?"

For the eelfish reason that, when a rich lode has been found, the wish to get as near as poeeible—in the hope that a cropping, parallel lode, feeder or spur may be obtained, to get a elice of the purchase money when a title is eought for. The true miner and prospector seldom takee advantage of the situation. The command, however, "Thou shalt not covet," is hard to obey. The class of men who will kick against the broad side lines of the *coyote* miners—chaps who sit out on the hillsides, with a bottle of whiskey, and howl for a piece of any man'e claim, through any adventitious circumstance, except to work or pay for it. Much more may be said on this subject if a discussion ensues.

"49er."

Siskiyou Items.

Editors Press:—On the night of the 30th of March, after a nice snow of about two inches, it commenced raining—the first rain since the 4th of Decemher—aud up to date it is still raining by epells—an "Oregon mist." The ground is thawed out and muddy. The lowlands are wet, and our crope are all late thie eeason. We have just passed through the hardest, coldest and longest winter known in this county for the last 20 years, eo old residents inform me. The snow on all the mountain ranges is deep. This makes the miner rejoice. A large amount of enow implies plenty of water; water means an ahnndance of work; work pays well usually; lots of "filthy lucre" taken out of the bosom of old Mother Earth insures better times. We look for a prosperous year. All the mines report well so far, Salmon river, Klamath, Black Bear, Scott's Bar, Sawyer'e Bar, Oro Fino, Muggineville, Quartz Valley, South Fork, French creek and in fact from all parts of the county comes a good report. Cory & Kingery, on French creek, report the ledge looking well and plenty of rich rock in sight, heside a good supply out. I hear that there is a good prospect of theee mines changing hands, possibly this month, one at $30,000, the other at $75,000. Hartstrand will resume work as soon as he gets his crops in, as will also Root and others. Roberts is running the Welsh placer mine. Nelson ie piping on Miners' creek. Jim Connor hae a good prospect in hie quartz.

Our towns are all improving. Of our county seat, Yreka, I can say but little, not having been there since last fall, but I hear of several business changes and improvements.

Fort Jones ie improving. Several nice, aubatantial buildings have been lately erected, and quite an increase in the population goes to show that that vicinity is prospering.

Etna has inaugurated several changes. The oldest atore, that of Denny & Brown, was lately eold, lot, buildings, stock of goods, etc. The new owners propose erecting a two-story brick building this eummer. The old Diggles stand, owned hy Alex. Parker is to be moved and a brick put in its place.

It is said we are to have a fine brick blacksmith shop by Ames & Johnson. Several neat cottages are under headway. J. O. Welsh, our photographer, informs me he contemplates erecting a two-etory building, the lower etory for a store, the upper one for a gallery.

Callaghan'e Ranch has had the honor of erecting quite a number of neat residences, and now Albert Denny is building a stone edifice to be ueed for a etore.

The farmers, not be left in the background, are improving their farms. I hardly know of a farm that oannot boast of eome new buildings, fences, addition of land, stock, or in some way showing that they are prospering. A few farms are changing hands, not many; and those few at good round prices. The farmer is now getting good prices for all his produce. I gave 90 cents per bushel for wheat April 3d. Barley rangos at $1.25 to $1.50 per 100 pounds; oats at $1 to $1.50; potatoes, 1½ to 2 cents; beans, 6 to 8 cents; hay, $15 to $20 here, $40 to $45 in Yreka, etc. Now, at these prices with fair crops, ought we complain? It is true we are snowed in almost every winter—that is, the roads sonth are closed for freight teams, and sometimes only eleighe can pass for several months, but we can go to any of the towns in the county, and we usually enjoy good health. Our lands produce well, etock does well, and we handle money, if we don't save much of it. Well, I tire your patience, so for the present.

R. D. Nunnally.

The Proposed Mining Law.

Editors Press:—I see, from the provisions of the bill introduced into Congress by Mr. Converse to provide for the survey and disposal of the public lands of the United States, that some of the most sweeping and radical changes are proposed as to the manner of locating mining claims, as to the application for patents to the eame, and as to the manner of contesting rights to mining claims.

It seems to me, Messre. Editors, that either the attention of the people of the Pacific coast has not been sufficiently aroused and called to these proposed changes, or else that they are marvelously lethargic and indifferent to their rights and interests. If they were sufficiently aroused and awake to the ruinous effects of the bill of Mr. Converse, if enacted into a law, they would be holding indignation meetings all over the coast. There are many features of this bill which are very objectionable to me, and some of which I propose to notice through your journal, if you will publish my communications or articlee.

The first moet radical change I desire to notice, is that proposed in Section 169 of the hill, whereby it is proposed that all mining olaime located after a certain day in this year, "ehall be bounded, as to surface, by etraight lines, and all right to minerals contained therein ehall be confined within vertical planes passing downward through said straight boundary lines." This provision, if it becomes a law, will, without any donbt as to all mining claims located after its enactment, cut off the right of the locator or owner to follow his ledge or vein on its dip outside of the eurface boundaries of his claim, or outside of the "vertical planes passing downward throngh said etraight (or surface) boundary lines." Under the law as it now is (see Section 2320 of the U. S. Revised Statutes), no location of a mining claim can be made until the discovery of the vein or lode within the limits of the claim located, and the vein or lode must be in the center of the claim, for the statute says, "no olaim shall extend more than 300 feet on each side of the middle of the vein at the surface." Under the bill of Mr. Converse, there is no such provision as this, as I understand it, but the locator can locate his ledge or vein, either in the center of his claim or on one side of it, as he may choose. Now to illustrate one of the effects of the operation of this feature of hie bill, suppose that "A" should make a location of a mining claim, believing from the eurface indications that his ledge dipped to the west (as was the case at first with the Ophir or Comstock ledge in the Virginia mining district, Nevada), and, therefore, with a view of covering the ledge as much ae possible on its dip, should make his location mostly to the west of the croppings of his ledge, and after some little development "B" should come along and see that the ledge was dipping to the east and should locate the eurface ground for a ledge to the east of "A's" claim, will it not readily be seen that "B" would take "A's" ledge so eoon as it dipped outside of the snrface boundary and into or under "B's" surface ground? And this might happen within a few feet from the surface, for "A" might he mistaken as to the dip of his ledge at the enrface, whereas, after getting down a short distance from the anrface, he might find hia ledge dipping in just an opposite direction to what he supposed when he located it. Is it intended by the bill to work any such injustice and wrong as this? That it will do so there can be no doubt.

A mining corporation, which may have expended large amounts of money in prospecting and opening up ite claim, under auch a law as this bill proposes, might, just at the time it reaches the pay portion of its ledge and thinks it is going to reap the fruits of its large expenditures and great efforts, faith and perseverance, awake to a knowledge of the fact that it has no mine or ledge, but that some one else owns what it purchased or located and always supposed rightly helonged to it—that some one else owned the pay portion of the ledge it located or purchased and has alwaye worked since its location. Would this not discourage prospecting? Would it not discourage, in a great degree at least, mining as an industry? We do not like to expend our money and work that others may enjoy it *only*. It is the hope and expectation that we will come into the enjoyment and possession of the fruits of our own lahor that stimulates and nerves us to endurance, hardships and risks. Take this hope and expectation away from us, and we cease to try and will refuse to risk. Faith, hope and expectation are the levers which move the mining world. And yet it is eeriously proposed in Congress to take these elements away from the miner, the prospector and locator, by cutting off his right to follow his ledge, and thereby to deprive him of the fruits of his lahors, faith, hope, pereeverance and industry. Who would risk anything under such a law? It would utterly paralyze mining and prospecting for mines.

There is another feature of this bill, which, if it ehould become a law, will be more paralyzing and destructive to the miuing industry and prospecting for the mines, than the one noticed.

By the fourth subdivision of Section 174 of the hill, the locator, his assigns or his duly authorized agent, is required to make, under oath, an application in the propsr land office for a patent to his mining claim. This is required to be done within one year after the approval by the Surveyor-General of his survey, and this approval, I understand from the third subdivision of the same eection, must be made or given within 90 days from the posting of the notice of location. This has reference to all claims located after the passage of the bill. As to those claims located prior to the passage of the hill we will notice further on. It will be further noticed or observed that if the owner of a mining claim does not make application for a patent within the time required hy the bill, it will he forfeited and become subjsct to relocation, for this fourth subdivision says, "within one year from the approval, by the United Statee Surveyor-General, of said survey, the locator, his assigns or his duly authorized agent, (who) has or have complied with the terms of this chapter, shall file in the proper land office an application for pateut under oath," etc; and Section 177 expressly declares, "that failure of the claimant to make proof of work aud payment, within the time, herein hefore prescribed, shall work a complete forfeituro of the claim, and the survey theretofore made ehall he canceled." These two sections make it clear and indisputable that the owners of mining claims located under the bill enacted into a law, must apply for a patent thereto, within one year from the date of the approval, by the United States Surveyor-General, of the survey of the claim, or within 15 months from the location of the claim, or in case of failure to eo do, said claim will be and become "completely forfeited."

Now, in order or to enable the locator of a claim to make application for a patent, he ie required to show that he has paid the $50 required hy the third subdivision of this section, and that he has expended as much as $500 in labor and improvements on his claim, as required by the fourth subdivision. This makes $550. Now to this we must add the Government price of the mining ground, say, 22 acres at $5 per acre, the price of mineral land under the law as it now exists, and we have $110 more to he added to the $550, or $660. To thie we shall he compelled to add $100 more at least for attorney'e fees, in making the application and procuring the patent, making the sum of $760. This is the lowest figure at which he could patent his claim, if the Government surveyed his claim for him, but I understand from Section 187, that the expense of eurveying claims shall he paid by the applicants. The expense of the eurvey of his claim will run all the way from $100 to $250 or $300, owing to the dietance the claim is from where the Deputy United States Mineral Surveyor lives, and to the expense of getting to and from the claim and the time and assistance required in making the eurvey. Say then that his eurvey will cost him $200, and we have $960, which he will be compelled to pay for his patent, and all of this within 15 months from the date of bis location. When you take into the account cost of abstract of title, notarial fees and the necessary cost of the applicant in traveling to and from the county seat of his county, where he must go to get his eurveyor and see his attorney, I venture the assertion that $1,000 will not more than pay all the expense necessarily incurred by the applicant in procuring or getting his patent, and this, it must he borne in mind, he will be compelled to pay within 15 months from the date of his location. What becomes of your poor prospector under such a law? Will the poor prospector or miuer care to prospect for mines when he knows that he never can perfect a title to his mine? Your "Prospect Bills," "Old Virginias," "Comstocks," "O'Reileys," and other prospectors will be no more if this proposed bill becomes a law. The idea of compelling a person to apply for a patent to his mining claim within any time is all wrong anyway. The law ae it now is, compelling him to do $100 worth of work on his claim, if located after the 10th of May, A. D. 1872, or $10 for each 100 feet, if located prior to that date, is a efficient coercive towards inducing owners of mining claims to apply for patents to their claims. This compelling owners of mining claims to apply for patents within a certain time was what made the so-called "Negley Amendment," so obnoxious and objectionable to the people of this Virginia mining district. The proposed bill proposee to extend the principle of the "Negley Amendment" to all the mineral lands of the Unitéd States, except in certain States excepted from the operations of the bill. As proposed in the "Negley Amendment," it only applied to the mining claims within 2,000 feet on either side of the Sutro tunnel, and the time within which the application for patent was to be made, was eix months from the passage of the bill. The mineral lands of the United Statee should be not only open and free to appropriation, occupation, or possession and development by citizene of the United States, but no obstructions should be placed in the way and no unnecessary burdene ehould be impoeed upon such citizens by legislation in reference to such lands. To require them to apply for patents would not only be placing obstructione in the way and imposing heavy and unnecessary burdens upon the mining industry of the country, hut it will almost put an end to the further development of new mines. It will discourage and almost terminate prospecting for mines. This is a hard rule, and nine-tenths, and possibly 99 out of 100 of the claime located under the bill if it becomes a law, will lapse—will be forfeited. Indeed, but few new claime will be located after it becomes a law.

But will this bill, if it becomes, a law, compel owners of mining claims, located prior to the passage of the law, to apply for patents to their claims under this law? I say it will. Section 190 of the bill says: "That all rights which havo attached to mining claims, under previous acte of Congress, shall not be affected by the operations of thie chapter: Provided, That where such claims have not been, or ehall not, within one year thereafter, he consummated by the required payment of purchase money, such unconsummated claims shall lapse, and the land embraced therein shall thereafter he subject only to the operations of this chapter." It is my opinion that the proviso to the above section will compel all owners of mining claims, whether located under previous acts of Congress or under this bill enacted into a law, to apply for patents to their claims. It is true that the beginning of this section saye, "that all rights which have attached to miuing claims, under the previous acts of Congress, ehall not he affected by the operations of thie chapter;" and hy reason of this language and the construction placed upon the proviso itself, I have heard it said that it is not the purposo of the proviso to compel the application for a pateut. The construction placed on the provizo hy those taking this view of the object and purposo of the eection is this: They say, that whilst it is not intended by this proviso to compel the application for a patent, yet it is intended to compel the owners of mining claims to pay the Government for them, that such owners might, by depositing the Government price of their claims in the local land office, take no other or further steps towards perfecting their claims until it suited their convenience and pleasure. It will not, I suppose, be contended by any one that a title can he obtaioed under the proviso or the bill enacted into a law without the owner making his application to the Government therefor. It ie only contended that the owners of mining claims under this proviso may simply pay the Government price of his claim iuto the local land office, there to await the final perfecting or consummating of his title by applying for and obtaining his patent. Now admitting that the above construction of this proviso is correct, yet when you compel the miner to pay the Government for hie claim, or lose it, you compel him to perform or discharge one of the burdene in applying for a patent. It is doubtless true that if the payment iuto the local land office of the Government price of his land or claim is all that is required by this proviso of the owner of a mining claim, he would be relieved of some of the burdene of the proviso, supposing it to require the owner to apply for a patent, and to do all those things required by the bill, in order to obtain a patent; yet even this would be an unnecessary burden imposed on the owner of a mining claim, for the roaeon that it would frequently require him to pay for his claim before he has sufficiently developed it to determine whether it is of any value or not; and for the further reason that it would frequently require him to pay the Government price of his claim when he would be least able to do so. But is this construction of the proviso right? Is it maintainable? Is it the proper construction to be placed on that proviso? I say not. In construing all statutes or conetitutional provisions we are to ascertain, if we can, the intention of the Legislature which passed the the law or the convention which framed the constitution. This intention is to he ascertained, first, if we can, from the language of the statute or Constitutional provision; second, from the context; third, the apirit and object of the law; and fourth, from the surrounding circumstances and conditions of the country under which the law is enacted or the provisions framed. The language of the proviso is that "where auch claims (that is, those claims located under previous acts of Congress) have

Continued on Page 246.

MECHANICAL PROGRESS.

Blistering of Paint and Varnish.

Many are the opinions expressed regarding blistering, and although some very sensible theories are advanced, we are inclined to believe that the bottom of the subject has never been reached. We hold an opinion of the cause of this trouble, and it may be that this opinion has been forestalled by others, but as we have never seen the points laid down in print, we present them here.

Blistering of a varnished surface after the varnish has had proper time to harden is due to the evaporation of moisture which lies confined under the shell of varnish. This evaporation is caused by heat, and it is seldom, if ever, a blister will rise upon a varnished surface without the temperature is raised to an extreme degree, near to that which the varnish received in its manufacture.

The accumulation of moisture *under* the varnish may be brought about in several ways, the most particular one being in the closing in of moisture in the rough stuff. During the rubbing of the rough stuff the water used is partly absorbed, and unless due care is taken to give ample time for "drying out" before the application of subsequent coats, a great amount of moisture will be confined within the cells of the rough stuff.

Boiled oil contains moisture, as of water, and in cases where steam is used to express the oil from the seed this percentage is increased. Turpentine, an extremely volatile liquid, also forms an evaporating substance which is rendered active by a slight heat, and in its haste to reach the air it disturbs the outer surface, either lifting an elastic coating into bubbles or blisters, or bursting open a hard and inelastic one into cracks.

The primary cause, then, of blistering is moisture, either in the form of wet moisture or of evaporating liquids, such as turpentine. The wood may be unseasoned, or it may have been wetted in the course of preparation, such as steaming to bend, etc. The rough stuff water may have been applied before the evaporation of liquids had taken place, either of which would bring about disastrous results.

"Dry blistering" is simply the hasty absorption of the liquids from outer coats by putty or paint which is expressly porous, depriving the coating of the requisite amount of binding and adhesiveness.

To prevent blistering, close up every lurking place for moisture by the use of the A B C system of painting, which will be found to be as easily done as repeating the alphabet. Be careful to have each coat dry before applying another, and you may laugh at the trouble which some of the craft call "deviltries."—*Coach Painter.*

On Drills and Drilling.

The attention of many professional men and others interested in mechanical operations has for a lengthened period been directed to this subject. As must be well known, there are a great many descriptions of drills now in use—some good, some indifferent. The American twist-drills are now sold in large quantities, and for some purposes answer exceedingly well; but at the same time there are points to be reckoned against them. Firstly, it is very difficult to grind both edges at the same angle, and if this is not done, the result will be that the hole will not be the true size of the drill used; this will deceive a workman, and may probably spoil good work. And another objection to them is, that when the drill is about to come through the hole being bored, the quick twist causes it to worm through at such a speed that, in many cases, the drill is either broken, or the work forced up to the end of the twist, thus spoiling what might otherwise have been a smooth hole. We consider that the best description now in use is the straight-fluted drill, which was originally introduced by a Mr. Martin, of Charlton; but this gentleman having for some long time ceased to make them, there arose a difficulty in procuring them. They are now, however, to be had more readily, and a set of these drills should certainly be found amongst the tools in every workship.

With all the improvements that have from time to time been introduced in the various drills, in most factories, we have frequently noticed, that except for very large work, every workman prefers to make his own drills, and from personal experience we have found no better drills than those thus made, to do which is a simple process. For example, a drill-chuck being fitted to the lathe, with a round hole one-fourth inch in diameter, and a fixing-screw; have always at hand a bar of round cast steel of the correct diameter, to fit the hole, and cut off a length as required. If the drill is to be made of a large diameter, it must be flattened out at the forge to the desired size, and then finished with a file. Most workmen, nowadays, simply forge their drills and grind them into shape; this answers every purpose for work that does not require any finish, all that is necessary is that the tool should run pretty true in the lathe and cut well. In boring a hole in thin work it becomes necessary to make it flat at the bottom. To do this a small half-round bit placed in the same chuck answers the purpose. This is essential where the hole has to be topped, as it allows of one or two more threads being made by the top. If the drill is required to be smaller in diameter than the steel from which it is made, it is a simple matter to turn down the end and then file it flat on both sides, to the same shape as the larger one previously mentioned. A great point with regard to drilling is the hardening of the drills. * * * In using all drills for boring a hole between the centers of the lathe, it is a most essential thing to let the work turn round occasionally in the hand. A certain way of boring a true hole of large diameter, say three-fourth to one inch, is to fix in the chuck a well-made cylinder-bit, and carefully fix the work on the saddle of a self-acting lathe, and place on the change-wheel used for a fine finishing cut. * * * For very small work the bow drill is a most useful tool. Bows are made in many ways, and from different materials. Those for sale are of steel, with a hook at the end, over which a thin catgut is looped, with another hook near the handle, and to alter the tension a small toothed wheel with a detent is used. * * The Archimedian drill is also used for many small pieces of work. This is made from pinion-wire carefully twisted into the form of a very quick screw; and to tap the nut for it a similar short piece must be made and the end tapered off to the bottom as if it were of the thread. This done a hole must be drilled in the piece of metal that is to form the nut, and the tap, as we will call it, be driven through it. This will form a corresponding screw for the long one to work in. * * * To know how such a thread is put into a piece of metal may be of service for other purposes.—*Forge and Lathe.*

Structural Changes in Wrought Iron—Bridge Accidents.

A correspondent of the *Railway Age* writes, in regard to a change in the tensile strength of iron, as follows: I have collected and sent to you some iron bolts, links, etc., that have been in use a long time (I wish I knew how long); they are broken short off and exhibit in the fracture all the appearance of cast iron, showing that even the very best wrought iron, such as is selected for links and link-pins, undergoes a radical change in structure by long usage in a continuous state of vibration, which seems to be violent enough to rupture the fibers of the iron and to totally destroy their continuity. Now I have reason to believe as the result of observation, that the metal of an iron bridge is subjected to a continual and almost uninterrupted succession of concussions while in a state of extreme tension, precisely similar in effect to those sustained by a link which connects a long freight train with the engine. Lateral jerks, without tension, seem to produce the same effect upon the large vertical bolts which connect the body of the car with the truck.

When you look at these specimens you will think I have had some cast-iron bolts made and boxed them up for you, for I believe they can all be broken short off with a sledge. One of them I saw broken myself, opposite the depot with a sledge to detach it from the draw head. It was intended only to loosen the bolt, but it broke like a pipe stem. This bolt or pin of iron from appearances, had been in constant use for 10 years.

It is a singular fact that in the conclusion reached by committees of investigation in bridge accidents, no thought of a possible deterioration in *the tensile strength of the iron*, ever enters their minds. The verdict is, universally, that the plan of the bridge was perfect, and the cause of ite fall involved in mystery. They never seem to suspect that the bridge fell because it was too weak to stand, although it would appear to be palpable fact. How strange that it never occurs to them that, however strong the bridge was originally, so strong as to bear twice the weight that broke it down, its strength must have been impaired or it would never have failed to sustain the usual weight.

It will be acknowledged before long that all iron truss framed bridges are every year impaired in tensile strength, and that their sudden fall is inevitable, especially with the heavy loaded cars now in use.

HEAVY LOCOMOTIVES.—The tendency at this time seems to be to increase the weight and draft of railroad locomotives, and to decrease the weight of care in proportion to the load which they are designed to carry. The Pennsylvania Railroad Company are now building at their shops in Altoona a new fast passenger engine, to run between Philadelphia and New York. It will have drivers five feet eight inches in diameter. If it works satisfactorily nine more of them will be immediately constructed for the same road. They are also building 60 locomotives of the Modoc pattern, recently described in these columns—the heaviest ever built. The engineers do not like these heavy engines, but the company appears well satisfied with their pulling capacity.

WELDING TUBES AND TIRES.—Herr Krupp, of Essen, has recently patented in Germany a method of welding tubes and tires, which is based upon an excellent idea. He draws the tube over one of a pair of ordinary rolls, and then heats the whole length of the portions to be welded by a special contrivance, which is a portable fire-box, into which air is so blown that the heat is directed against the weld. After the necessary heat is attained the rolls are set in motion and the place to be welded is repeatedly drawn through them.

SCIENTIFIC PROGRESS.

Cold Light.

There are many operations connected with industrial pursuits in which the employment of artificial light is an absolute necessity, and there are conditions under which such light, if deprived of its dangerous attribute, heat, would prove of inestimable value. Amongst the many purposes for which such a light might be advantageously utilized, we have only to mention the working in mines, in powder magazines, and in ships' holds, stores, and other smaller compartments. Many attempts to produce such a light have been made from time to time, and to a certain limited extent some have succeeded, although hardly in a practical sense. In 1864, Geissler's tubes were introduced for this purpose into several French collieries, with some success, the battery arrangements being modified to suit the intended purpose. Since then we have had several attempts to produce what we may term a "cold light" by means of agents possessing phosphorescent powers. Amongst others, Mr. W. H. Balmain has succeeded in producing a compound which in some points resembles paint, and inasmuch as it becomes highly luminous in the dark, it has received the name of "luminous paint."

With regard to the composition of this paint we can only say that its components are chiefly lime and sulphur, the remarkable results of their combination being the effect of special manipulation. We know that the sulphides of lime and baryta and some kinds of marine shells become luminous in the dark after having been exposed to the daylight for a short time. It was precisely on these lines that Mr. Balmain worked, and he succeeded in producing a compound which can be painted over any surfaces, and which, after exposure to light for a few minutes, becomes highly luminous when taken into a darkened apartment. It will retain its luminosity for about six hours, after which it must be again exposed to the light in order that it may absorb a fresh supply of rays to be afterwards usefully given off in darkness.

The precise nature of the luminous ingredients are not known to us, but they are stated to be produced from the chalk of our cliffs. Whatever they may be they are simply compounded with the usual carriers of ordinary paints, and are similarly applied. We recently had the opportunity of inspecting a number of articles prepared with this paint, which after having been exposed to daylight for a few minutes, gave forth in a darkened room a beautiful soft violet light, sufficient in some cases to enable any object in the apartment to be clearly distinguished. Should it be necessary to revivify the luminous object at night, it can be done by burning a few inches of magnesium ribbon in front of it. The explanation of these phenomena, perhaps, is that the molecules of the sensitive salt are put into vibration by the waves of light impinging upon them, and that the vibration continues long after the motive light is withdrawn, an action being set up which affects the eye in the same way as the vibrations of a bell struck by a hammer affect the ear.

The applications of which this remarkable invention is susceptible are very numerous. Amongst other things we may mention its use on life-buoys, which are thus rendered useful at night, and for lighting up the lower compartments of ironclads. Divers will also find it useful in their sub-aqueous operations. In fact, a diver recently found it of great assistance to him in 27 feet of water in the Southampton Docks, his dress and head-gear having been coated with the luminous paint. As a means of affording light in a portable form the luminous paint is applied on sheets of glass of various sizes which have received the name of Aladdin's lamps, and which are in use on board some of our ironclads, and in the spirit vaults of some railways. In fine, we deem this invention to be one possessing great merit, and one, moreover, which can hardly fail to prove a practical success, inasmuch as it supplies the desideratum of cold light.—*Iron.*

Prehistoric Man.

S. B. T. Skertchly, at a late meeting of the British Association, as reported in *Nature*, gave evidences of the existence of man in East Anglia during the glacial period. Human implements occur in the beds underlying the chalky bowlder clay, equivalents of the middle glacial series of S. V. Wood, Jr., and F. W. Harmer, near Mildenhall, Warren Hill, Culford in Suffolk, West Stow in Suffolk, and Brandon. Near Brandon the same beds have been dug into beneath the bowlder clay, with the same results. These proved the existence of man in those districts previous to the glacial periods. W. Boyd Dawkins, in the ensuing discussion, said the glacial period should not be looked upon as a dividing line in classification. The same animals lived in Europe before and after this period, which could not be a hard and fast line. Upon applying this consideration to the question of the antiquity of man, there was no *a priori* reason for supposing that man was not here in the pre-glacial age. Seeing that animals were living in Europe before the cold period arrived at its maximum, it was probable that man was here too. Man was living in the south of this country when the area north of the Thames was submerged — when the sea there was bearing icebergs, which were accumulating the bowlder clay. Sir John Lubbock felt considerable difficulty in resisting the conclusions drawn by Mr. Skertchly. Prof. Huxley could not see the slightest reason for supposing that pre-glacial man was in any respect different from post-glacial man. The evidence Mr. Skertchly had brought forward was very satisfactory. At a later meeting of the Cambridge Philosophical Society, O. Fisher gave an account of two visits to the localities described by Mr. Skertchly. At first he was not convinced; but, on making a more thorough examination, as at Mildenhall and Bury St. Edmunds, he found Mr. Skertchly's views confirmed. That gentleman was present at the meeting, and showed a worked flint taken by his own hands from the loam underlying the chalky bowlder clay. Hence, the conclusions of the Association paper were confirmed by Fisher, an independent observer and at first a doubter of Skertchly's statement.

The Influence of the Electric Light upon Vegetation.

At a recent meeting of the Royal Society, of London, Dr. C. W. Siemens, F. R. S., gave a detailed description of some experiments upon the above subject which have been conducted during the last two months at his house at Sherwood, and exhibited specimens. The method pursued was to plant quick-growing seeds and plants, such as mustard, carrots, swedes, beans, cucumbers and melons, in pots, and these pots were divided into four groups, one of which was kept entirely in the dark, one was exposed to the influence of the electric light only, one to the influence of daylight only, and one to daylight and electric light in succession. The electric light was applied for six hours each evening, from 5 to 11, and the plants were then left in total darkness during the remainder of the night. The general result was that the plants kept entirely in the dark soon died; those exposed to the electric light only or to daylight only throve about equally; and those exposed to both day and electric light throve far better than either, the specimens of mustard and carrots exhibited to the society showing the difference in a very remarkable way.

Dr. Siemens only considers himself as yet on the threshold of the investigation, but thinks the experiments already made are sufficient to justify the following conclusions: 1. That electric light is efficacious in producing chlorophyl in the leaves of plants, and in promoting growth. 2. That an electric center of light equal to 1,400 candles placed at a distance of two meters from growing plants appeared to be equal in effect to average daylight at this season of the year; but that more economical effects can be obtained by more powerful light centers. 3. That the carbonic acid and nitrogenous compounds generated in diminutive quantities in the electric arc produce no sensible deleterious effects upon plants enclosed in the same space. 4. That plants do not appear to require a period of rest during the twenty-four hours of the day, but make increased and vigorous progress if subjected during daytime to sunlight and during the night to electric light. 5. That the radiation of heat from powerful electric arcs can be made available to counteract the effect of night frost, and is likely to promote the setting and ripening of fruit in the open air. 6. That while under the influence of electric light plants can sustain increased stove heat without collapsing, a circumstance favorable to forcing by electric light. 7. That the expense of electro-horticulture depends mainly upon the cost of mechanical energy, and is very moderate where natural sources of such energy, such as waterfalls, can be made available. The paper gave rise to a highly-interesting discussion, in which it was pointed out that the evidence afforded of the practical identity, as regards vegetation, of solar and electric light, besides the probability that it would be turned to immediate account by horticulturists, would afford great facilities for the scientific investigation of the influence exerted by light, as compared with other agencies, in promoting the formation of the active principles or most valuable constituents of plants, such as the quinine of the cinchona bark, the gluten of wheat and so forth. Before concluding his observations, Dr. Siemens placed a pot of budding tulips in the full brightness of an electric lamp in the meeting room, and in about forty minutes the buds had expanded into full bloom.

INFLUENCE OF SHAPE UPON ATTRACTION.—C. Lagrange refers to the following proposition, which he demonstrated two years ago: "When attraction varies inversely as the squares of the distance, if the distance is considerable, any mass acts with maximum, mean, and minimum energies, in three rectangular directions which are respectively the axes of minimum, mean, and maximum inertia." From this proposition he deduces the following results: "1. A mass of any form, at a certain definite distance from its center of inertia, acts with maximum, mean, and minimum energies, in three rectangular directions, which coincide respectively with the three axes of minimum, mean, and maximum inertia. 2. The relative positions of a point and of a material system, submitted to their mutual attraction, are determined by the stable axes of equilibrium in the system; the axes of minimum, mean, and maximum inertia are respectively axes of stable equilibrium, stable in one plane and unstable in a perpendicular plane, or unstable." The first of these deductions he regards as fundamental in the mechanical theory of crystallization.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 25		Week Ending Apr. 1.		Week Ending Apr. 8.		Week Ending Apr. 15.	
Alpha	8½	7½	7½	....	7	6½	7	6
Alta	4	3¾	3.70	3.40	2.60	2¾	2.30	2.40
Andes	75c	55c	80c	60c	90c	75c	1¼	85c
Alps	....	....	....	....	....	....	....	....
Argenta	70c	65c	1.10	65c	65c	55c	55c	50c
Atlantic	....	....	....	....	....	....	45c	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	35c	30c	25c	....	....	....	....	....
Belcher	6	5¾	4¼	3.55	3¼	2¾	2.05	2.15
Belmont	30c	15c	20c	....	35c	15c	40c	35c
Best & Belcher	10¾	10	10	9¾	9¾	8¾	13¾	8¾
Bullion	5	4.40	3.80	3½	3¼	2.70	3.40	2¾
Bechtel	2	....	1.85	1.60	2	1¾	1.80	1.60
Belle Isle	1.30	1.05	1.20	1.05	1.05	90c	75c	60c
Bodie	7¼	7¼	11	9	9¼	8¾	9	7¾
Benton	2.40	2.10	2.60	2.30	2.20	1.35	2	1.65
Bulwer	9¾	9	7¾	7¼	9¼	7¼	6¾	5¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	80c	60c	90c	70c	85c	70c	75c	65c
Belvidere	3¼	3.40	3	2.90	3¼	2¾	3¼	2.60
Booker	60c	55c	55c	50c	60c	50c	50c	45c
Caledonia	1.40	1.05	1.10	1	1	80c	90c	60c
California	3¾	3.15	3.05	3	2¾	2¼	2.90	2¼
Challenge	1¾	1½	1.60	1½	1.55	1¼	1.70	1¼
Chollar	6¾	6	5¾	5¾	5¾	5	5¾	4.60
Confidence	7¼	7	7	6¾	6	5¼	6¾	4¾
Con Imperial	55c	50c	50c	45c	45c	35c	50c	35c
Con Virginia	3.55	3.35	3.45	2.90	3.05	2.65	3¼	2.55
Crown Point	3¼	2.95	3	2.60	2.45	1.80	2¼	1¼
Con Washoe	....	....	....	....	....	....	....	....
Champion	400	30c	1.20	45c	1¼	75c	1	85c
Concordia	50c	....	1¼	80c	1¼	80c	1.10	1
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1¼	75c	80c	70c	90c	80c	1.15	75c
Eureka Con	21¾	15¾	19¾	20¾	18¾	16¾	18¾	18
Exchequer	3¼	3	....	2¼	2.60	2¼	2.80	2.15
Endowment	10o	....	10c	5c	30c	25c	30c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1¼	1¾	1.55	95c	1.40	90c	95c	70c
Gila	....	....	....	....	....	....	20c	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodshaw	40c	35c	45c	35c	40c	25c	35c	30c
Gould & Curry	5¾	5¼	5¾	4¾	4¾	4.10	6¼	4
Hale & Norcross	6¾	6	6	5¾	5¼	4.80	5¾	4.60
Hillside	90c	75c	....	....	75c	60c	75c	60c
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	1	....	1.05	1	1	90c	....	....
Julia	1¼	1.10	1.10	1	1.45	80c	1.35	1.05
Justice	2	1.55	1.70	1.55	1.55	1¼	1¼	1.15
Jackson	4¾	....	4¾	3¼	4	3	3	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	4	3¼	4	3¼	4¼	3.95	3¼	....
Kentuck	3	....	3	....	3	2¼	....	....
Kossuth	....	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	25c	20c	....	....	20c	15c	....	....
Lady Wash	80c	55c	65c	....	65c	50c	60c	35c
Leopard	10c	....	....	....	10c	....	....	....
Leviathan	40c	35c	35c	....	35c	30c	30c	25c
Leeds	50c	....	....	....	30c	....	30o	25c
Lee	....	....	....	....	....	....	....	....
May Belle	25c	15c	25o	20c	25c	20c	15c	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1	90c	85c	80c	1.05	1	1	....
Martin White	80c	65c	35c	....	35c	25c	50o	40c
McClinton	80o	65c	85o	55c	80o	60c	70c	55c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	14¾	14	14	13	13¾	10	10¾	9¾
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	45c	35c	35c	27c	30c	15c	25o	15c
Northern Belle	18¼	17¼	17¼	16¾	18	17¼	17¼	16
New Coso	....	....	....	....	4¾	4¾	....	....
Navajo	35c	25c	35c	25c	35c	25c	40c	30c
Occidental	1.30	95c	1.40	1	1¼	70c	2.60	1.30
Ophir	18¾	17¾	17¼	16¾	15¾	11¾	11	9¾
Oriental	50c	....	....	....	60c	....	50c	....
Overman	2.60	2	2.05	1.80	2	1.10	1.65	1¼
Pantber	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	10c	....	....	....	....	....	2	....
Potosi	4.70	4.10	3.85	3¾	3.85	2.90	3¾	2¾
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	85c	75c	75c	40c	60c	35o	35c	25o
Richer	....	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	6¾	5¾	5¾	5.05	5	3.95	4.35	3.55
Seg Belcher	1¾	1¼	....	....	4.80	4¾	....	....
Sierra Nevada	21¼	20¾	21¾	19¾	20	15¾	16¼	14¾
Silver Hill	1	80c	70c	60c	70c	65c	65c	55c
Silver King	6	5¾	6	5¾	5	....	5	4¾
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	1.10	1	1.15	1	1¼	1.10	1.15	1
Scorpion	3¼	3	3	2.85	2.80	2¼	2.60	2¼
Solid Silver	....	....	....	....	....	....	15c	....
South Bodie	60c	55c	55c	50c	50c	40c	35o	....
South Standard	25c	20c	25c	....	20c	15c	10c	....
Star	25c	....	25c	....	25o	....	25c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1¾	1.40	1¾	....	1.40	1	1¼	1.40
Tioga Con	2.60	2.40	2¾	2¼	2.60	2	2.05	2
Tiptop	4¼	4	....	....	4¾	4	5	....
Trojan	....	....	10c	....	10c	....	....	....
Union Con	38¼	36¼	39¾	35¾	32¾	26	28¾	25
Utah	10¼	9¾	10	8¾	10¼	8¾	11	8¾
Vermont Con	....	....	....	....	....	....	....	....
Ward	1¾	1.65	1¾	....	1.65	1¾	2¼	1.65
Wells-Fargo	5o	....	....	....	5c	....	....	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	8¾	7¾	8¾	7¾	7¾	6¾	7¼	6¾

Sales at S. F. Stock Exchange.

Friday A. M., Apr. 9.

500 Andes.....80@85c
30 Alta.....2.40
30 Alpha.....6¾
580 Belcher.....2.60@2.70
220 Benton.....1¾@1.70
1335 Bullion.....2¼@2.80
335 Best & Belcher.....9¾@9¾
210 California.....2¾@2.55
270 Con Virginia.....2.55
65 Chollar.....4.60
15 Challenge.....1¾
190 Dorado.....1.30
270 Con Imperial.....45c
60 Confidence.....5¼@5¾
235 Caledonia.....65@60c
600 Crown Point.....1¾@1.60
100 Exchequer.....2.20@2¼
150 Flowery.....10c
200 Golden Gate.....50c
190 Gould & Curry.....4@4.05
145 Halo & Nor.....4.60@4¾
545 Justice.....1¼@1.45
100 Julia.....1.30
450 Leviathan.....30c
350 Lady Wash.....55c
500 Mackey.....10c
695 Mexican.....10¾@10¾
700 N Bonanza.....20@25c
125 New York.....2c
450 Occidental.....1.40@1.30
625 Overman.....1.10@1.15
630 Ophir.....11¾@10¾
280 Potosi.....2.80@2¾
160 Savage.....3.55
165 Scorpion.....2¼@2¾
50 Solid Silver.....15c
350 Silver Hill.....55c
840 Sierra Nevada..15¾@15¾
215 Utah.....8@8¾
1380 Union Con.....25¼@25¾
250 Ward.....1.65@1.70
210 Yellow Jacket.....6¼@6¾

AFTERNOON SESSION.

270 Addenda.....85@90c
1050 Argenta.....50c
1480 Albion.....55@60c
75 Belle Isle.....65@60c
400 Belmont.....40c
245 Bullion Hawk.....70c
100 Belvidere.....2.90
60 Bulwer.....6¾@6¾
275 Booker.....50c
205 Bodie.....8¾@8¾
263 Bechtel.....1.55@1.60
100 Boston.....1.10
900 Concordia.....1¼
700 Champion.....90@85c
60 Caledonia (B H)...2¼@2¾
155 O Pacific.....2.30@2¼
170 Day.....1¼
10 Eureka Con.....19
150 E Mt Diablo.....50@55c
70 Gila.....20c
950 Grand Prize.....80c
950 Goodshaw.....35@30c
100 Gipsy Q.....1.10
300 Holmes.....90c
140 M White.....50c
100 Mammoth.....2¼
100 Martin White.....1¼@1
30 McClinton.....70c
325 Manhattan.....1¼
300 May Belle.....10c
100 Mono.....7¼@7¾
350 Mt Potosi.....1.30@1.20
700 Navajo.....35c
1100 Ophir.....11¾@11¾
155 Noonday.....4¼@4.60
240 N Noonday.....6@5¾
600 Northern Belle...17¼@17¾
80 Oro.....5¾
200 Orient.....2¼@2¾
150 Paradise.....50c
245 Queen Bee.....30@25c
100 Red Cloud.....40c
50 Real del Monte.....1¼
500 Raymond & Ely..35@30c
300 Summit.....1.15
100 Syndicate.....1.40@1¾
300 S Bulwer.....55c
20 S Bodie.....35c
535 Tioga Con.....2.05
100 University.....25c
85 Wales.....29c

Saturday A. M., Apr. 10.

40 Aspna.....6¾
170 Alta.....2.60@2¾
300 Andes.....85@80c
500 Albion.....80@70c
220 Argenta.....55@50c
150 Addenda.....65@90c
1550 Atlas.....5c
710 Belcher.....2.70@2¾
270 Bullion.....3.65
55 Best & Belcher.....8¾@9
300 Belle Isle.....70c
260 Benton.....1¼
200 Belding.....75c
650 Bulwer.....6¾@6¾
140 Booker.....50c
250 Bechtel.....2.05
940 Bodie.....8
460 Con Virginia.....2¾@2.85
60 Chollar.....5@4.95
590 California.....2.60@2¾
415 Con Imperial.....40@35c
895 Crown Point.....1.80@1.85
240 Caledonia.....80@75c
50 C Pacific.....2¼
190 Concordia.....1
600 Champion.....55c
100 Dudley.....20c
300 Day Belle.....75@60c
1100 D Standard.....70c
50 Essex.....1.70
150 Exchequer.....2¼
650 E M Diablo.....60@50c
700 Endowment.....30c
10 Eureka Con.....1.90
250 Flowery.....10c
400 Golden Gate.....75c@1
370 Gould & Curry.4.30@4.40
600 Atlas.....2¼
300 Horcross..4.90@4.85
200 Holmes.....90c
220 Jupiter.....1.60@1¼
120 Justice.....1.40
530 Julia.....1.20@1.10
100 Jackson.....2¼
125 K K Con.....3¼
110 Lady Wash.....55c
450 Leviathan.....25@30c
800 Mackey.....10c
300 Mt Potosi.....1.10
10 Mt Diablo.....25c
50 M McClinton.....1
100 Mono.....7
50 Mammoth.....2.30
410 Mexican.....10¼@10¼
100 M White.....40c
75 N Belle Is.....1.05
325 N Bonanza.....25@20c
200 New York.....25c
50 Navajo.....35c
505 Northern Belle...17¾@17
120 Noonday.....4¼@4.60
153 N Noonday.....5¾@6
200 Orient.....15c
135 Oro.....5¼@5
910 Ophir.....11
165 Overman.....1.35@1.30
75 Occidental.....1¼
420 Potosi.....2.80@2.85
565 Queen Bee.....35@40c
200 Raymond & Ely.....25c
220 Savage.....3.80@3.95
100 S Standard.....10c
320 Scorpion.....2.35@2.30
100 Sumuit.....1
50 Syndicate.....1¼
475 Sierra Nevada...15¾@15¾
80 Silver Hill.....60c
30 Tioga Con.....2.05
910 Union Con.....26¾@26¾
85 Utah.....9¾@9¾
200 Ward.....1.65
220 Yellow Jacket.....6¼@6¾

Monday A. M., Apr. 12.

600 Andes.....80@85c
225 Alta.....2.60@2.55
100 Alpha.....6
590 Beat & Belcher.....8¾@9
240 Bullion.....2.85@2.90
530 Benton.....1¼@1.65
900 Belcher.....2¼@2.15
20 Confidence.....5¼
750 Con Imperial.....35c
455 Crown Point...1.60@1¾
210 California.....2.70@2.65
185 Con Virginia.....2.90
150 Chollar.....4.80@4¾
125 Caledonia.....80@75c
250 Con Dorado.....1.40
190 Exchequer.....2.15@2.20
130 Flowery.....15c
75 Golden Gate.....75c
265 Gould & Curry.4.45@4.50
50 Hale & Nor.....4¾
510 Julia.....1.10@1.05
300 Justice.....1.20@1.30
140 Lady Wash.....55c
800 Mackey.....10c
110 Mexican.....9¾@9¾
570 N Bonanza.....20c
50 Occidental.....1¼
880 Ophir.....8¾@10
330 Overman.....1¼@1.30
310 Potosi.....3¾@3.70
530 Savage.....3.80@3.70
220 Silver Hill.....55c
515 Scorpion.....2¼@2.30
793 Sierra Nevada...14¾@14¾
100 Utah.....8¾
1410 Union Con.....25¾@26
320 Yellow Jacket.....6¾@6¾

AFTERNOON SESSION.

270 Addenda.....85@90c
1050 Argenta.....50c
1480 Albion.....55@60c
75 Belle Isle.....65@60c
400 Belmont.....40c
245 Bullion Hawk.....70c
100 Belvidere.....2.90
60 Bulwer.....6¾@6¾
275 Booker.....50c
205 Bodie.....8¾@8¾
263 Bechtel.....1.55@1.60
100 Boston.....1.10
900 Concordia.....1¼
700 Champion.....90@85c
60 Caledonia (B H)...2¼@2¾
155 O Pacific.....2.30@2¼
170 Day.....1¼
10 Eureka Con.....19
150 E Mt Diablo.....50@55c
70 Gila.....20c
950 Grand Prize.....80c
950 Goodshaw.....35@30c
100 Gipsy Q.....1.10
300 Holmes.....90c
140 M White.....50c
100 Mammoth.....2¼
100 Martin White.....1¼@1
30 McClinton.....70c
325 Manhattan.....1¼
300 May Belle.....10c
100 Mono.....7¼@7¾
350 Mt Potosi.....1.30@1.20
700 Navajo.....35c
1110 Ophir.....11¾@11¾
155 Noonday.....4¼@4.60
240 N Noonday.....6@5¾
600 Northern Belle...17¼@17¾
80 Oro.....5¾
200 Orient.....15c
150 Paradise.....50c
245 Queen Bee.....30@25c
100 Red Cloud.....40c
50 Real del Monte.....1¼
500 Raymond & Ely..35@30c
300 Summit.....1.15
100 Syndicate.....1.40@1¾
300 S Bulwer.....55c
20 S Bodie.....35c
535 Tioga Con.....2.05
100 University.....25c
85 Wales.....29c

Tuesday A. M., Apr. 13.

960 Andes.....90@95c
70 Alta.....2.90@2.85
100 Alpha.....6¾
580 Belcher.....2.90@2.95
70 Benton.....1.95@2
460 Bullion.....3.30@3.40
775 Best & Belcher...12¼@13¾
885 Con Virginia.....2¾
600 Con Dorado.....1¼@1.45
150 Challenge.....1¼
2995 Con Imperial.....40c
45 Confidence.....6
460 Crown Point..2.1⅛@2.10
140 Chollar.....5¼@5¾
110 Exchequer.....2.80
150 Flowery.....15@10c
150 Golden Gate.....75c@80c
575 Gould & Curry.....6¼@6¾
255 H & Norcross.....5¾@5¾
300 Justice.....1¼@1.45
120 Julia.....1.30@1¼
100 Leviathan.....30c
600 Lady Wash.....55@60c
50 Mackey.....15c
150 Mexican.....10¾
2200 N Bonanza.....20@25c
450 New York.....20c
110 Occidental.....1¼
150 Flowery.....15@10c
150 Golden Gate.....75c@80c
Bodie Tunnel & M Co
Bullion M Co
Champion M Co
Commonwealth Con M Co
Con Pacific M Co
Day'S M Co
Endowment M Co
Equitable T & M Co
Indian Queen M Co
Julia Con M Co
Jupiter M Co
Leopard M Co
Mammoth M Co
Martin White M Co
Modoc Con M Co
Mono G M Co
Monte Cristo Con M Co
Navajo M Co
North Bonanza M Co
Occidental M Co
Oriental Con G & S M Co
Overman S M Co
Raymond & Ely M Co
Real Del Monte M Co
Sierra Nevada M Co
Solid Silver G & S M Co
South Bodie G M Co
South Bulwer G M Co
Tellurium G & S M Co
Tioga Con M Co
Utah S M Co
Yellow Jacket S M Co

AFTERNOON SESSION.

1000 Albion.....65@60c
650 Argenta.....50c
1450 Addenda.....85@80c
600 Atlas.....2¼
300 Boston.....1.10
340 Belle Isle.....65@70c
105 Bulwer.....6¾@6¾
245 Bodie.....8¾@9
263 Bechtel.....1.65@1¾
200 Belmont.....35c
370 Belvidere.....3.15@3¼
110 Black Hawk.....75c
190 Booker.....45@50c
1030 Concordia.....1@1.10
570 Champion.....90@1
70 C Pacific.....3.40@3.30
750 D Standard.....40@35c
520 Day.....1.15@1.10
50 Eureka Con.....19
250 E M Diablo.....80@75c
50 Gipsy Queen.....1.05
500 Goodshaw.....35c
350 Grand Prize.....90@95c
100 Holmes.....1
10 Hillside.....75c
150 Jackson.....3
150 Jupiter.....1.60
400 Metallic.....1¼@1.15
500 May Belle.....15c
50 Mt Potosi.....1¼
100 McClinton.....65c
300 Martin White.....50c
65 Mammoth.....2.85
100 Mono.....7¼@7¾
130 N Belle Is.....25c
260 Noonday.....3¼@5
100 Northern Belle...16¾@17
300 Paradise.....50@45c
100 Queen Bee.....40c
50 Real del Monte.....1¼
100 McClinton.....65c
300 Martin White.....50c
65 Mammoth.....2.85
100 Mono.....7¼@7¾
130 N Belle Is.....25c
260 Noonday.....3¼@5
100 Northern Belle...16¾@17
300 Paradise.....50@45c
100 Queen Bee.....40c
50 Real del Monte.....1¼
250 Alpha.....6¾
600 Belcher.....2.40@2¼
485 Best & Belcher...12@11¾
195 Benton.....1.85@1.80
500 Bullion.....3.30@3.15
50 Confidence.....6@6¼
2030 Con Virginia.....3¼@3.10
520 Crown Point.....2@1.95
200 Chollar.....5¾@5
300 California.....2¼@2.90
90 C Dorado.....1.40
360 Challenge.....1.70@1.65
170 Caledonia.....75c
350 Con Imperial.....45@40c
100 Essex.....1.30
190 Exchequer.....2¼@2.40
50 Fairfax.....15c
2300 Flowery.....10c
475 Gould & Curry...5¼@5¾
70 Hale & Nor.....5
330 Justice.....1.40
220 Julia.....1¼
285 Lowtahan.....30c
50 L Wash.....60c
175 Mexican.....10¾@10¾
200 Mackey.....15c
650 N Bonanza.....20c
400 New York.....20c
50 Occidental.....1¼
330 Ophir.....10¾@10¾
345 Overman.....1.30@1.40
170 Potosi.....3¼
320 Scorpion.....2.55@2¼
600 Silver Hill.....65c
650 Sierra Nevada.....20c
280 Savage.....4.15@4¼
60 Utah.....10@9¾
350 Union Con.....26¾@26
150 Ward.....1.80
295 Yellow Jacket.....7@6¾

AFTERNOON SESSION.

300 Addenda.....85@80c
50 Argenta.....55c
600 Albion.....75@70c
700 Belmont.....35@40c
300 Belle Isle.....65@60c
175 Bulwer.....6¾
200 Boston.....1.15@1.10
650 Black Hawk.....70@65c
25 Belvidere.....3¼
200 Belding.....75c
120 Bechtel.....1.60@1¾
275 Booker.....50c
100 Chollar.....30c
125 Bechtel.....1.60@1¾
275 Booker.....50c
100 Champion.....95c
50 C Pacific.....3¼
825 Concordia.....1.05@1.10
600 Day.....1.15@1.05
600 D Standard.....50@60c
845 E M Diablo.....75@60c
870 Grand Prize.....90c
35 Goodshaw.....90c
350 Holmes.....85@90c
300 Jupiter.....1.40@1¼
25 K K Con.....3¼
200 Leeds.....30c
100 Martin White.....90c
200 Metallic.....70c
350 Mt Hilton.....55@55c
150 Mt Potosi.....1¼@1.20
220 Mono.....7¼
165 Mammoth.....2¼
140 Northern Belle.....16
300 Navajo.....40@35c
200 Noonday.....4¼@5
1000 N Belle Is.....20c
1000 N Noonday.....4¼@5
50 Oro.....5¼
300 Orient.....20c
400 Paradise.....50c
300 Queen Bee.....45c
540 Raymond & E...35@30c
50 Real Del Monte.....1.30
1030 Red Cloud.....40c
35 Silver King.....3¼
450 S Bulwer.....85@90c
25 Sumuit.....1
100 Syndicate.....1.40
170 Tioga.....2
200 University.....30@25c
580 Wales.....29c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	3	20	Mar 25	Apr 30	May 21	T H Dixon	328 Montgomery st
Alta S M Co	Nevada	17	50	Apr 5	May 10	May 31	W H Watson	302 Montgomery st
Andes S M Co	Nevada	14	25	Feb 26	Apr 1	Apr 20	B Burris	309 Montgomery st
Belmont M Co	Nevada	23	20	Mar 3	Apr 8	May 5	J W Few	310 Pine st
Belvidere M Co	California	6	60	Mar 4	Apr 6	May 1	C V-D Hubbard	203 Bush st
Belcher S M Co	Nevada	22	75	Apr 2	May 6	May 27	J Crockett	203 Bush st
Benton Con M Co	Nevada	3	50	Apr 2	May 7	May 25	W H Watson	302 Montgomery st
Bodie Tunnel & M Co	California	4	20	Feb 3	Mar 21	Apr 28	A F Main	309 California st
Bullion M Co	Nevada	14	1 00	Mar 25	Apr 28	May 18	J M Buzzell	Safe Deposit build'g
Champion M Co	California	6	50	Feb 28	Apr 5	Apr 27	J Crockett	203 Bush st
Commonwealth Con M Co	Nevada	2	10	Mar 24	Apr 26	May 13	C A Morse	217 Sansome st
Con Pacific M Co	California	1	1 00	Mar 13	Apr 16	May 8	F E Luty	330 Pine st
Day'S M Co	Nevada	5	05	Mar 2	Apr 6	May 3	J F Few	310 Pine st
Endowment M Co	Nevada	2	25	Mar 1	Apr 5	Apr 26	E M Hall	327 Pine st
Equitable T & M Co	Utah	22	10	Mar 22	Apr 30	May 25	O J Collins	227 Montgomery st
Indian Queen M Co	Nevada	3	15	Feb 11	Apr 19	May 10	G Adams	431 California st
Julia Con M Co	Nevada	11	50	Mar 3	Apr 7	Apr 26	H A Charles	419 California st
Jupiter M Co	California	8	40	Mar 31	May 4	June 2	E C Maston	309 Montgomery st
Leopard M Co	Nevada	13	10	Apr 5	May 7	May 28	E M Hall	327 Pine st
Mammoth M Co	California	4	1 00	Feb 18	Apr 24	May 21	A W Rose	302 Montgomery st
Martin White M Co	Nevada	6	50	Mar 22	Apr 28	May 20	J J Scoville	309 Montgomery st
Modoc Con M Co	——	9	1 50	Mar 18	Apr 26	May 17	J W Few	310 Pine st
Mono G M Co	California	7	1 00	Mar 9	Apr 13	May 4	W H Lent	309 Montgomery st
Monte Cristo Con M Co	California	3	10	Mar 19	May 8	June 3	B Burris	309 Montgomery st
Navajo M Co	Nevada	6	10	Mar 22	Apr 23	May 14	E M Hall	327 Pine st
North Bonanza M Co	Nevada	5	25	Mar 20	Apr 23	May 18	W W Stetson	309 Montgomery st
Occidental M Co	Nevada	6	50	Mar 9	Apr 12	May 3	A K Durbrow	309 Montgomery st
Oriental Con G & S M Co	California	6	50	Mar 3	Apr 3	Apr 17	H C Hinman	411 California st
Overman S M Co	Nevada	45	60	Apr 6	May 12	June 2	G D Edwards	414 California st
Raymond & Ely M Co	Nevada	14	25	Apr 5	May 10	June 7	W L Elliott	328 Montgomery st
Real Del Monte M Co	Nevada	10	50	Mar 4	Apr 30	May 3	V D Hubbard	203 Bush st
Sierra Nevada M Co	Nevada	62	1 00	Mar 3	Apr 6	May 26	——	309 Montgomery st
Solid Silver G & S M Co	Nevada	3	2 00	Mar 8	Apr 10	Apr 28	E L Parker	309 Montgomery st
South Bodie G M Co	California	3	25	Apr 13	May 15	June 5	R Hewson	320 Sansome st
South Bulwer G M Co	California	3	15	Apr 8	May 12	June 2	H Deas	309 Montgomery st
Tellurium G & S M Co	California	7	50	Apr 2	May 3	May 27	W Stuart	320 Sansome st
Tioga Con M Co	California	21	10	Feb 24	Apr 26	May 17	J M Caulfield	420 California st
Utah S M Co	California	9	20	Mar 22	Apr 26	May 17	W H Lent	309 Montgomery st
Yellow Jacket S M Co	Nevada	29	2 00	Mar 3	Apr 6	Apr 26	G C Pratt	309 Montgomery st
	Nevada	36	1 00	Feb 14	Mar 29	Apr 28	M Otey	203 Bush st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Argonaut M & M Co	California	3	1 00	Mar 30	May 1	May 24	J L Fields	240 Montgomery st
Arizona P & M Co	Arizona	1	05	Feb 13	Apr 5	Apr 27	O E Travers	331 Montgomery st
Atlanta M Co	Utah	1	05	Dec 23	Apr 29	May 24	A F McGrew	420 Montgomery st
Blackhawk G M Co	California	8	25	Mar 17	Apr 21	May 13	H A Charles	419 California st
Butte Hydraulic M Co	California	2	10 00	Feb 29	Mar 30	Apr 19	L L Denney	729 Montgomery st
Cosumnes Buena Con S M Co	California	6	20	Feb 21	Apr 19	May 4	R N Peoples	509 Sacramento st
Fairfax M Co	Nevada	2	20	Apr 7	May 10	May 31	O C Miller	324 Pine st
Florida Hill M Co	Idaho	2	10	Feb 25	Apr 7	May 4	R Wegener	414 California st
Gover M & M Co	California	41	10	Mar 8	Apr 12	May 3	W O Wilson	402 Front st
Headlight M Co	California	2	10	Mar 20	Apr 16	May 14	A W Rose	302 Montgomery st
Hillside M & M Co	Nevada	3	50	Apr 9	May 12	June 7	H Frankenthal	330 Pine st
Idaho S & S M Co	California	1	10	Mar 25	Apr 26	May 12	O Meade	324 Pine st
Iowa M Co	Nevada	4	25	Mar 1	Apr 5	Apr 26	E M Hall	327 Pine st
Kennedy M Co	California	17	1 00	Mar 22	Apr 26	May 17	A Wissel	210 California st
Last Chance M Co	California	1	05	Feb 28	Apr 10	May 3	G W Fisher	324 Pine st
Maryland Con G & S M Co	California	1	25	Mar 17	Apr 20	May 8	E P Farnsworth	202 Sansome st
Mineral Fork M & S Co	Utah	2	08	Feb 21	Apr 24	May 18	S Purdy	331 Montgomery st
Oro M Co	California	4	25	Feb 18	Mar 26	Apr 21	——	302 Montgomery st
Queen Bee M Co	California	6	10	Mar 13	Apr 19	May 10	G W Fisher	324 Pine st
Relief Con M Co	California	1	10	Apr 3	May 7	May 27	W J Taylor	310 Pine st
Republic Con M Co	California	1	10	Apr 3	May 7	May 27	W J Taylor	310 Pine st
Silver Hill T & M Co	California	1	05	Mar 3	Apr 5	May 5	J B Mackie	309 California st
Vanderbilt M & M Co	Nevada	1	15	Apr 12	May 20	June 16	J Morizio	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Brilliant M Co	——	J M Buffington	309 California st	Annual	Apr 21
Endowment M Co	Nevada	E M Hall	327 Pine st	Annual	May 3
Gopher Con G M Co	——	T Widmann	404 Montgomery st	Annual	May 23
Iron Cap M Co	Arizona	C Meade	324 Pine st	Annual	Apr 28
Indian Queen M & M Co	California	G Adams	431 California st	Annual	Apr 27
Justice M Co	Nevada	R E Kelly	419 California st	Annual	May 3
Laguria G & S M Co	——	A B Cooper	328 Montgomery st	Annual	Apr 17
Morning Star M Co	Nevada	J B Mabolm	331 Montgomery st	Annual	Apr 27
San Carlos Coal M Co	——	A J Kopsch	230 Montgomery st	Annual	May 24
Silver King South M Co	——	A Judson	320 Sansome st	Special	May 9
Silver State M Co	——	J Morgan	310 Pine st	Special	Apr 22
Willow Creek S M Co	——	S Heydenfeldt	310 Pine st	Special	Apr 22
Wellington M & Smelting Co	Utah	R Wegener	414 California st	Special	Apr 29
Woodville Con S M Co	Nevada	R E Kelly	419 California st	Annual	May 3

LATEST D

Pacific Board—Latest Sales.

Wed'sday A.M., Apr. 14.		150 S Nevada	15¢
50 Alpha	6¢	150 Savage	4¢
150 Andes	1.15@14	200 Silver Hill	63¢
50 Benton	1.80	100 Utah	90@92
500 Belcher	2.30@2.35	100 Union Con	25@26
200 Bullion	3.20	310 Yellow Jacket	6½@7
600 Best & Belcher	12¼@11	**AFTERNOON SESSION.**	
320 Con Virginia	3.55@3	110 Alpha	7¢
260 California	24@22	260 Andes	1.60@1.15
100 Chollar	5	170 Best & Belcher	12¼@12¢
450 Con Imperial	42¢	130 Con Imperial	45¢@50
300 Crown Point	2.05@1.95	350 Con Virginia	3¢@3.70
240 Exchequer	2.55@2.45	500 Flowery	15¢@10¢
860 Gould & Curry	5.60@5¢	200 Gould & Curry	5¢@6
200 Hale & Nor	5	120 Julia	1.20
250 Julia	1.30@1¢	150 Mono	7¢
230 Justice	1¢@1.40	150 Overman	3.40@3.35
300 Mexican	10¢@10	160 Ophir	10¢@10¢
220 Ophir	10¢@10¢	50 Occidental	1¢
400 Overman	1.40	60 Savage	4.60
100 Occidental	1¢	920 Silver Hill	65¢@66
150 Scorpion	2.45@2.35	120 Yellow Jacket	7¢

Mining Share Market.

The mining share market, as usual, remains in a depressed condition. There has been no information forwarded from the mines to cause any change for the better, and without it there isn't likely to be any change. In fact unless a "bonanza" is uncovered in some of the stock mines before long, we do not see what is to be come of the market. With so many of the mining magnates and stock operators going off East, Pine street langnishes for an excitement of some kind, and those that remain do not seem able even to get up a fictitions one.

On the Comstock the main interest is at the north end. With the completion this week of the sump to the winze from the 2400 to the 2500 level of Union, preparations will be inaugurated for connecting that winze with the Union shaft. The *News* says it is a fact that of late no striko in Belcher is so satisfactorily successful as an oyo-opener as that of the diamond drill when it recently encountered water on the 3000 level. When the flood forced itself through the feed pipe up to the 2560 level it said in plain words that all the eastings on all the levels from the 2560 to the 3000 level had been in vain. None of them had been far enough or in the right spot to tap this water; hence here is an unexplored vein, the condition of which is entirely unknown. Its horderings to the west on the 3000 level are good; the indications on the 2760 are suggestive, hut further than this all is conjecture. That strike of water multiplied the prospects of Belcher at least a hundred fold. Further south interest centers chiefly around the crosscuts recently started in Alta, which have not yet been pushed far enough to he productive and to the opening of virgin ground in Silver Hill.

The Dangers of Tunnel Driving.

The disease and mortality among the laborers in the St. Gothard tunnel has been excessive. The distance between the entrance to the tunnel and tho places where the perforators were at work, which was nearly five miles on the north side, coupled with the frequent freezing of the compressers, rendered ventilation extremely difficulty; nnd the nir was further fouled hy frequent explosions of dynamite, the smoke of some 500 oil lamps and the exhalations of 400 men and 40 horses, working in a temperaturo of 80° to 95°. The horses, nlthough working only eight hours in twenty-four, died at the rate of 25% per month, often dropping down suddenly in their tracks as though shot dead. The men died in large numhers of n peculiar disease called tunnel trichinoses, from the presence of an entozoon in the intestines. Three or four months lahor in the tunnel brought on the disease, aud twolve months generally made the laborer a confirmed invalid, even if he survived. The symptoms were yellowness of skin, features drawn, eyes half closed, lips discolored, skin humid and gait difficult. Even when the food was taken with appetite it would not digest, and wine was invariahly rejected. The Italian doctors pronounced the tunnel "a veritable h—l."

Bullion Shipments.*

Since our last issue, we have noticed the following hullion shipments:

Oneida, for March, $7,321; Christy, Apr. 6, $3,707.17; Contention, Mnr. 30, $5,083.92; Alice, Mar. 30, $8,000; Dexter, Mar. 30, $2,500; Wells, Fargo & Co., at Eureka, Apr. 7, $1,800; Richmond, Mar. 7, $15,720.05; Standard Con., Mar. 5, $30,070.49; Bulwer, Con., Mar. 5, $8,781.79; Bodie Con., Mar. 5, $4,884.80; Mar. 1 to Mar. 24, $24,284; Grand Prize mine, for March, $18,722; Con. Virginia, Apr. 10, $58,556.50; Northern Belle, Apr. 7, $7,902.78; Paradise Valley, Apr. 7, $3,556.10; Northern Belle, Apr. 10, $9,033.08; Christy, Apr. 13, $6,306; Golden Terra, Apr. 3, $27,000; Standard Con., Apr. 12, $40,704.68; Bulwer Con., Apr. 12, $7,771.75; Gold Hill (I. T.), Apr. 8, $28,120; Noonday, Mar. 1 to Mar. 24, $16,598.

*Desiring to make our list of Bullion Shipments as complete as possible, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

THE Postoffice Department, during the first nine months of the present year, issued to Postmasters $23,979,335 in postage stamps, stamped envelopes and postal cards.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

PROSPECTING. Amador *Dispatch*, April 10: There seems to be quite a revival in quartz prospecting in the vicinity of the Montcrichard mine. We understand that Rigney & Caminetti and Wilson & Kitridge have struck encouraging leads, and are now sinking shafts on their respective claims.

DRYTOWN ITEMS.—The Gover has been getting out good rock lately, but not in sufficient quantities to keep the mill running steadily, as the vein is at present only 2 or 3 ft wide. The Quartz Mountain company is progressing rapidly with their preparations for roasting and milling, and will probably be ready to commence in a few days. The outlook for them seems to be very favorable, as they have had assays of $36 gold, and $80 in silver out of the refuse rock on the old dump. The Yellow Jacket has had no crushing yet, on account of the high water washing their pipe away, but they intend connecting the pipe which runs the pump at the mine with the Bonanza mill, to which runs a newly-graded track on trestle work across the creek. They have a ledge about 5½ ft in width, of splendid rock. There is a rumor here to the effect that a company of New York capitalists have bonded the California and N. California mines (formerly the Potosi and Webster), and are also negotiating for the North Gover.

SHAKE RIDGE ITEMS.—The Ourang Gutang quartz-mining company, of Shake Ridge, has commenced operations on their claim, which is located about 1½ miles southeast of the Golden Gate mine. We understand that Mr. Heath, from Whitmore's mill, has struck some very rich diggings on Mill creek, from which he is taking out about $10 per day.

CALAVERAS.

HYDRAULIC "DROPS."—Calaveras *Chronicle*, April 10: Clean-ups have been made this week in 2 of the great hydraulic claims in this vicinity. First, the Mammoth, on Tunnel ridge, "Veith's claim," gave an account of itself. The golden brick is said to have been one of the biggest ever cast here, worth between $25,000 and $30,000. Next comes the Maison de Sente with a handsome clean-up; not quite so large as that of the Mammoth, but reaching well into the thousands, nevertheless. The Maison de Sante is one of the best paying mines in this vicinity, relatively speaking, the scale of operations being taken into consideration.

BREAK IN THE DITCH.—During the severe rainstorm of Friday of last week, the Water company's ditch broke. By dint of hard work and perseverance, damages have been so far repaired that the water will be got through this morning.

SHEEP RANCH.—We have it from excellent authority that the future prospects of the Wallace & Ferguson mine, at Sheep Ranch, are more brilliant than ever. The main shaft has now reached a depth of 400 ft, and levels are about to be run. At that point the ledge shows wider than ever, while the rock is fully the equal in richness of any ever taken from the mine.

STRUCK IT.—We are very glad to hear that a wide ledge of good rock has been struck in San Pedro at Glencoe.

ABOUT ANGELS.—*Echo*, April 10: We learn that John Miller, of Albany Flat, recently discovered a huge pocket, out of which he obtained as high as $60 to the pan. The Dogtown mines were never looking better. The mines in the vicinity of Angels are doing as well or better than at any time during the past 2 years. Quite a number of men are engaged in working on the Invincible, with good prospects ahead. We hear favorable reports from the Murphys mines. Some of the claims are paying better than the most sanguine had hoped for. The mines in the vicinity of Vallecito are said to be doing well. Some claims on the flat are immensely rich. Henry Geriach, of Angels, found a piece of gold the other day weighing considerably less than $700.

EL DORADO.

GREENWOOD ITEMS.—Georgetown *Gazette*, April 10: The French mine, owned by the California Water Co. and Simon Desmarchels, under the management of the latter, is paying handsomely. F. C. Leavitt has sent to San Francisco 10 tons of ore from the French mine to be tested by Frank Shay & Co.'s new process, by which it is claimed all the precious metals will be extracted and saved. The Bower have run a sluice grade tunnel from American canyon through the hill, and are now under bedrock flat, formerly noted for its rich gold deposits. They are now raising the tunnel, and when the opening is made to the surface they will commence washing said flat by hydraulic process. The Blibtrue & Schaller mine, located on west side of American canyon, is steadily worked by hydraulic process, and the owners are realizing handsomely. The Brockmann mine is located on the south side of the toll road from Greenwood to Georgetown. A decomposed quartz lode for the cropping can readily be traced on the surface for a long distance on the range. The Black Rock mine, owned by C. Leavitt, T. Pendergast and other residents of San Francisco, having erected a fine five-stamp mill on the premises, are now steadily developing the mine.

MARIPOSA.

MERCED HYDRAULIC MINING CO.—Mariposa *Gazette*, April 10: The Merced Hydraulic Co. at the Red Bank are pushing the work of hydraulic mining most vigorously ahead. At present there is an ample supply of water, which is received from Scott's gulch. The little giant exposed a boulder of about 500 pounds of slate and quartz mixed, one side of which was covered with quartz well filled with free gold. The Red Bank aside from its vast body of good paying dirt and gravel is known to contain rich deposits of the precious metal mixed with quartz and other substances carrying minerals. Already Surveyor Bost is on the ground surveying the route for a canal, to connect the works with the Benton mill dam, a distance of about 2 miles. This will insure plenty of water for hydraulicing purposes the whole year.

MONO.

ADDENDA.—Bodie *News*, April 11th. Preparations for putting guides in the shaft and placing cages in position for facilitating the work of development are now in progress, and when completed this mine will be worked on the true Comstock style.

SOUTH NOONDAY.—The north drift, 150 level, is 0 ft wide of good milling ore. Work in the north drift has been suspended for the present at a point 44 ft north of the main east crosscut, at which place a winze has been started on the ledge and is now down 6 ft. Judging from present appearances in the winze a large body of high-grade ore will be opened up. Are still piling up the ore extracted, on the ore dump for future use.

QUEEN BEE.—Work in the north drift on the 400 level is being pushed steadily forward. The ledge shows a very fine body of ore of a better quality than yet uncovered and gives promise of opening out into a very heavy body of high-grade ore. The character of the ore is decomposed quartz that crumbles in the hand and borns free gold.

TIOGA.—The flow of water continues about the same, the average being 3,600 gallons per day. Since connecting with the Syndicate at the 520 level it has become necessary to timber about 000 ft of the tunnel, which is now being done.

SOUTH STANDARD.—The rock works and breaks well, the formation continuing of the same favorable character, cutting seams of ore that give good assays and clay seams that yield free gold, all standing in nearly a vertical position, making from the surface. The mine is now entirely free from water.

KING BEE.—The formation continues of the same favorable character, bunches and stringers of bright, lively quartz continually coming in. A station set has been put in at the 200 level preparatory to drifting and crosscutting.

BODIE TUNNEL.—The building at the month of the tunnel for the reception of the company's machinery is all raised and partially closed in. The machinery is now due here and expected to arrive at any day, when it will be immediately set in place and the work of extracting milling ore from the numerous veins of the company will be prosecuted.

NORTH STANDARD AND BULWER.—Since cutting the Calhahan lode they have passed through a very fine formation of vein porphyry that works well and gives good indications of cutting other ore bodies.

NEVADA.

BROINNINO WORK.—Nevada *Transcript*, April 10: Dr. Holdsworth has ordered of the Marysville foundry a water-power saw mill and four-stamp quartz mill, with which to begin work on the Mastodon gravel claim above Eureka. The machinery will be delivered on the ground about May 15th.

A GOOD PROSPECT.—A. Vance & Co., who are developing a ledge near the Sneath & Clay mine, on Ould Flat, have thus far extracted about three tons of ore, which is said to be of very good quality.

SIERRA.

NORTH FORK.—*Mountain Messenger*, April 10: From a candle box of gravel, taken out of this rich drifting claim at Forest City, the handsome sum of $11 was realized. In the North Fork gangways gravel extends down one-third the depth of the tunnel.

KENTON.—Nothing is being done at the Kenton. A sale of this quartz property is being negotiated in New York by C. S. Benham, L. C. Butterfield and others, with good prospect of its advantageous disposal to foreign capitalists.

SCHULTZ.—Baid Mountain Quartz Co., 2 miles and a half down Oregon creek, below Forest City, have run a tunnel 200 ft through blasting slate rock, nearly east, tapping the ledge, which promises well.

ORIENTAL.—The Oriental company, Allegbany, J. T. Bradbury Superintendent, are now running a crosscut on the 5th level to the footwall, where parties have worked over and left 8 ft of the ledge. The hoisting works are pumping out the water, day and night, at the rapid speed of 20 strokes a minute, and in a few days the mine will be drained to the 6th level, where rich quartz will be taken out. Six men are now employed. A larger force will soon be needed.

RAPID PROGRESS.—John Pearce, F. Craze, W. Lawry and T. Veal, the persevering and energetic contractors of the Bald Mountain Extension Co., Forest City, are now pushing their tunnel ahead at such rapid speed as to surprise even the oldest veteran miners who have been in that mining district since the good old times. Last month 100 ft of tunnel was run in the surprisingly brief period of 21 days, through cement or mountain lava. A fair profit is realized from the contract price per foot, $5. Holes are drilled in the face of the tunnel, from 3½ to 4 ft in depth, every blast throwing out about 2 ft of rock. Ten pounds of Giant powder are used for each day and night shift of 24 hours. No timbers are required, and on completion, should the lava formation continue, this airline tunnel will never need repairing and be a permanent "open sesamo" to the inexhaustible treasure vaults of Bald Mountain. The dimensions are 6½ ft high by 5½ in width. Fifteen carloads of cement are run out every 24 hours, which, considering the present length of the tunnel, over 1,700 ft, and also that only hand power is employed, is a very creditable amount of work for 4 men in the short time allowed. The water in the air shaft has a fall of 64 ft, thoroughly ventilating the tunnel. The supposition now is that possibly underneath the strata of lava there may be a rich gravel bed coursing through the South Fork to the Bald Mountain Extension ground.

TUOLUMNE.

COLUMBIA.—Tuolumne *Independent*, April 10: Mining and general work is again being resumed upon the advent of pleasant, sunshiny weather. Prospectors can be seen every morning in Columbia starting out with their pick, shovel and pan, heading for the mountains. New bonanzas will be discovered that have been traveled over for years by the old miners of early days. There is waiting in old Tuolumne county some of the richest mineral deposits on the Pacific coast.

LITTLE GEM is turning out the most flattering showings as a milling vein. The proprietor commenced the erection of a 10-stamp mill on the mine a year ago; all of which was accomplished from the proceeds of the mine during the time, by simply pounding the ore in a hand-mortar. The mill is complete and now in operation, working the lower grade ores that were thrown on the waste dump.

ALABAMA.—Work is being vigorously pushed towards placing the mine in the best possible condition for extracting and milling the ore. Through judicious management there is, in this claim, a large body of ore, which can be made available by a trifling outlay, in quantities that will supply a 50-stamp mill for many years to come. Other companies, located on the mother lode, east of the Alabama claim, and on Whisky hill, are actively engaged in developing their valuable mines. These are: The Moony & Co., the Preston & Co. and the T. C. Gresher claims. The probabilities are, during the coming summer, quartz mills will be erected on these various claims and Jamestown become the center of a rich quartz mining district, and from the steadily-increasing wealth of its mines will become a mountain town of no little commercial importance.

QUARTZ MT. G. M. Co.—This is the only mine at present on the mountain in full and active operation. A small force of miners employed in the mine take out ore in sufficient quantities to keep a 25-stamp mill running. The mill is convenient to the mine, and is one of the largest and best in the county. The company has placed, in connection with the ordinary batteries and plates, the most improved machinery for concentrating the sulphurets, separating, etc. Power is furnished by a 45-ft overshot water-wheel. The works have been carried down 500 ft.

KNOX & BOYLE.—This mine has been in progress of development a number of years, under management of A. B. Preston. Its present showing is very encouraging, and, so far as prospected, indicates permanency. A larger percentage of the vein is a very high-grade ore.

APP CLAIM.—This claim is located on a parallel lode—parallel to the great fissure vein which traverses the county, having an easterly and westerly course, and about 300 ft from this lode. Power is obtained from a large overshot water-wheel. Water can be supplied at reasonable rates. The working shaft is down on the vein 800 ft, in good milling ore. Then there are a number of other claims located on the main lode; also a number of side veins in progress of development.

TRINITY.

DEADWOOD.—Cor. Trinity *Journal*, April 10: Dolliffo is crushing Willey's rock from the Vermont ledge with Klein's upper arastra. Geo. Klein recently made a clean-up from 40 tons of $50 rock, Sebastian is running at full speed, Henry Overdick is taking rock out of the Monto Christo mine. Fred Diener is running both arastras on Frick & Davis rock, with enough on the dump and what they are getting out to keep him going for 6 weeks yet. Gibson Bros. are running their arastra in Donnelly gulch, in good rock. Spencer & Kelley have 130 tons on their dump; they have commenced digging a ditch, and will put up an arastra.

NEVADA.

WASHOE DISTRICT.

BELCHER.—Gold Hill *News*, April 14: Superintendent Smith expresses a determination to push the east crosscut from the south drift on the 2760 level ahead till the vein is thoroughly prospected in that direction. The proposition is being urged of connecting with the Yellow Jacket shaft on the 2760 level—2700 level of the Jacket—so that when the pumps of the Jacket are in working order they may be used to handle water, should more be encountered than can be conveniently raised by the Belcher pumps. The workings in this direction are already well into Kentuck ground.

OPHIR.—The north drift on the 2500 level is in 340 ft, and is passing through vein porphyry showing low-grade quartz.

UNION SHAFT.—The shaft has reached the 2500 level and a sump is being prepared. When this is completed a tank and pump station (so that the main pumps can be extended to this level) will be a necessity, and while the stations are being made the contemplated drift to connect with the 2500 station of the Sierra Nevada incline will be started. Repairs to the broken bobs are progressing well.

SIERRA NEVADA.—The east winze is being timbered from the 2300 to the 2400 level. The lateral drift north, on the 2400 level, has just been started, as has also a crosscut east from the foot of the winze.

CON. VIRGINIA.—The old workings on the 1500 and 1750 levels continue their yield of ore. The joint California east crosscut on the 2200 level continues in vein material showing some quartz.

NORTH BONANZA.—The winze from the 400 level is being continued on down, and is still in the body of base ore before noted. This body is certainly of large extent, as is proved by the explorations along and in it already made.

UNION CON.—The work of sinking a sump for winze No. 1 from the 2400 level still occupies attention. The stopes continue their accustomed yield of good milling ore.

CALIFORNIA.—The west crosscut on the 1500 level has reached the vein formation lying east of the old stopes; total length, 215 ft. The raise from the 2100 level is up 50 ft, and in low-grade quartz.

GOULD & CURRY.—The O. & C. and B. & B. shaft has attained a depth of 1,015 ft, where it is allowed to rest till the raise from the 1700 level connects with it.

CHOLLAR.—The south drift on the 2400 level is nearing the point where the vein is supposed, from its make on the levels above, to have swung heavily to the east.

HALE & NORCROSS.—The work of sinking the incline has of late been waited on to the necessity of perfecting a drain through the Chollar connection to the C. N. S. shaft, so that the water can be conducted to the pumps, there to be raised to the Sutro tunnel level.

SILVER HILL.—Both workings on the 1300 level are looking remarkably well.

MEXICAN.—No work has been done in the joint Union east crosscut, 2300 level, on account of the indications of water encountered. The drill holes have even been stopped up to prevent the flow of water tapped by the drills.

SIERRA.—Still following the ore body below the tunnel level. It improves with depth. Preparations are being continued to erect works and place machinery.

JULIA CON.—The old works have been shut down and hereafter work will be conducted through the Ward shaft, of which the company owns the half. Prospecting will be renewed on the 2200 level when the shaft reaches that depth.

ANDES.—The raise from the 200 level is opening up some low-grade quartz.

YELLOW JACKET.—The shaft is being pushed on down at the rate of a set of timbers per day; total depth, 2,925 ft.

SUTRO TUNNEL.—The north header is rapidly nearing the point of connection with the workings west from the C. & C. shaft. Work has been resumed in the south header and is progressing well.

NEW YORK.—Drifting south in the vein on the 1600 level and encountering a promising formation, the quartz of which yields encouraging assays.

I X L DISTRICT.

CARBONATE.—Paradise *Reporter:* Judge Harlan, who has just returned from I X L district, reports a good deal of snow in the mountains, although he was well pleased with the looks of the camp, and thinks I X L will be a second Eureka in less than a year. He reports mountains of carbonate ore of low grade, and with such excellent and convenient facilities for treatment, that they can be worked profitably, nut pine and water being abundant.

ARIZONA.

PROSPECTING.—*Arizona Sentinel*, April 10: The mining news from all parts of the county is most favorable. Parties are arriving daily by rail and wagons, and spreading themselves from Yuma to Williams Fort, on the north, up the forks and beyond into the ranges trending to the Gila, and embracing the Centennial district, and so along down into the Castle Dome range and district and Montezuma district adjoining the former on the southeast. In the latter place prospecting has been going on quietly for some months past by Mr. W. P. Miller and his associates. Veins of copper have been discovered and partially opened, showing heavy percentages of that metal, together with very considerable quantities of gold, and letterly, rich injections of silver, chlorides and carbonates. Prof. Blake has been some days at Castle Dome district, inspecting properties under his control, and it is currently reported that a formal opening of them will shortly be made, with all the adjuncts of improved machinery.

TOMBSTONE.—*Nugget*, April 8: The following is an exploitation of the mines belonging to the Tough Nut Co.: Tough Nut, 703 ft; levels, 1,520; cuts, 404. Goodenough, 147 ft; levels, 419; cuts, 45. West Side, 113 ft; Defense, 13-ft shaft. Surveyor, 10-ft shaft. Total shaft, 986 ft; levels, 1,033 ft; cuts, 440 ft. The cost of operating the mines and mill per ton is as follows: Mining, $2.50; transportation to mill, $4.15. reducing, $5; total, $11.65. The mill has been in operation something more than 0 months and has produced bullion during that time amounting to over $300,000.

AVERAGE.—A fair average of the real value of tho ore in the Grand Central may be taken from the following figures. A sample of the ore taken from the upper level from each bucket during an entire day and then averaged on 3 different days, assayed as follows: First day, silver, $1,013.79; gold, $110.46; second day, silver, $370.20; gold, $50.27; third day, silver, $020; gold, $100. No ore has been taken from the mine only as required to sink the shaft and run the levels, and there are now 1,200 tons on dump. Steam hoisting works are to be erected immediately, when the work of developing will begin in earnest.

BULLION.—The amount of bullion received in Tucson last week from the mills of Tombstone district was $82,420.83. Of this amount only $4,912.57 was from the Corbin mill, which was only in operation a portion of the time, but when that one is in full blast, the yield of their 15 stamps can be well imagined when understood that they will run on the same ore as the Tombstone mill, which chipped $16,710.76 during the week as against $30,300.60 from the Contention. These amounts exceed the combined shipments of all the mills of the Territory, prior to Tombstone's discovery.

TURQUOISE DISTRICT.—This district and its neighborhood are becoming as prominent as any section about us. Fine samples of ore are being brought in almost every day, and a great deal of work is being done. Samples from the Alice mine, owned by Leonard, Pace & Frary, yielded, from several tests, $72 silver, $6 gold and 60% copper. Such a showing as this is well worthy the attention of anyone desiring to invest in mines.

DAKOTA.

CARBONATE.—*Black Hills Times*, April 7: What's the use of going to the sickly camp of Leadville for carbonates when we have mountains of it right here in the Black Hills? We have lying on our table at this present writing about 1 pound of yellow carbonate ore from the Lucky Boy, Bald mountain, so rich that silver can be melted from it with a common blowpipe. Small pockets of carbonates have been found in different parts of that district upon several occasions during the past year; but now Thomas P. Edwards, the owner of the above-named mine, which is located on Nevada gulch, near the new silver mill, has struck a well-defined vein of it, from 2½ to 4 ft in thickness, lying between shale and quartzite formations. The vein, which was encountered about 10 ft from the surface, has a dip of between 15° and 20°, and widens as it is followed in. Mr. Edwards, who has 3 claims lying side by side along the foot of the mountain, has tapped this same bed of carbonates in each, thus showing that it is extensive. It is believed that the same bed extends across the gulch, as Gen. West has found a similar vein on the oppo-

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The Proposed Mining Law.

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not been or shall not within one year thereafter be consummated by the required payment of purchase money, such unconsummated claims shall lapse, and the land embraced therein shall thereafter be enhject only to the operations of this chapter." Where such claims shall not he consummated within one year, hy the required payment of purchase money! What is the plain English of this language, what does it mean and what is it intended to mean? "Consummated," hy Webster, means "completed," "perfected," "ended." Where such claims, then, have not been completed or perfected or ended within one year, hy paying the Government therefor, all such claims shall lapse, that is, fall in or become forfeited. How is it possible that a claim can be completed or perfected or ended until the owner has obtained an absolute title thereto from the Government? And how can he ohtain such a title without applying to the Government for a patent? And how can he ohtain his patent without doing all those things required hy the hill in order to ohtain his patent? So you see that it is manifest from the language of the proviso itself that the intention of the bill is to compel all owners of mining claims located under previous acts of Congress, to apply for patents to the same, under a penalty for failing to do so of forfeiture of the claim. It is therefore unnecessary to go further and look to the context, the spirit and ohject of the hill, or the surrounding circumstances and conditions of the country, in order to conclude that the intention of this proviso ie to compel ownere of claims located under previous acts of Congress to apply for patents to such claims "within one year thereafter" or lose them. But what is meant hy the language "within one year thereafter?" What is the time allowed hy thie language within which the claimant can make bis application for his patent? From what time, circumstance or event. does the year commence running? Does it mean within one year from the passage of the bill into a law, or does it mean eomething eise? "Thereafter" what or when? This language seems to my mind obscure, uncertain and unintelligible. If it is intended to force all claimants of claims located under previous acts of Congress, or located hefore any act of Congress was passed on the subject of locating and obtaining Government titles to mines, to apply for patents to their claims under a penalty, in case of failure to do so of forfeiture of the claim, why not say so in plain, intelligible and unmistakable language? It is true that such a law would he altogether wrong, oppressive and unjust, hut then if that is the intention, it is better to eay so in such language as cannot he mistaken, than to leave the section (190) so ohscure, uncertain and unintelligihle, that no one can he certain of its purport and meaning. A. B. ELLIOT.

Virginia, Nevada, April 2, 1880.

Hardened vs. Unhardened Horseshoes.

EDITORS PRESS:—To make horses-hoes last tbey should he toed with steel in the usual way, or a small piece of hlister steel not larger than your thumb, welded across the shoe at the toe, will answer all practical purposes. The shoe thea, after heing well leveled, should be heated to as high a heat as the steel will eafely bear, and then plunged into cold water, toe down; the shoe being held in a vertical position while cooling to prevent springing.

Blacksmiths will tell you that shoes treated ae above will hreak, hut never mind that. Fit them well to the feet, and you will have shoes that will last two or three times as long as similar shoes unhardened will. In fact, they will last so long that it will he necessary to ehift and nail them on several times hefore they can he worn out, it heing impractical to let them remain on until worn out for apparent reasone that need no explanation. B. T.

DEBRIS QUESTION IN CONGRESS.—The House Committee on Mines and Mining have reported the joint resolution heretofore agreed upon hy the Committee, which provides for the appointment of a commission of two civil engineers and one officer of the Coast Survey to investigate the debris question, and appropriates $250,000, to he forthwith expended under the direction of the Secretary of War for the protection of the navigahle streame of California from further injury hy loosened debris now in the mountain gorges. The joint resolution was placed on the calendar for future action. It will bave to await its turn and is not likely to be reached for two months or more.

THE PIONEER WOOLEN MILLS.—Work on the new building for the Pioneer Woolen Mills at North Point will he pushed forward as rapidly as possihle. The foundation has heen laid, and the walls nre np to the line of the ground floor, and these are now ready to receive the floor timhers. When the New Constitution went into force the proprietors of the mills discharged all the Chinese employed in and around the premises, and filled their places with white boys and girls. Since then the quarters formerly oocupied hy the Chinese employees have heen demolished, and now not a Chinaman is to he seen around the mills.

Edible Mushrooms.

Varieties of Field Fungi Fitted for Food.

At the Academy nf Sciencee February 16th, Justin P. Moore, of San Rafael, read a paper on "Edible Fungi," which gives a good deal of practical information thnt ought to he more generally known in relation to the varions kinds of mushrooms fitted for human food. After a brief introductory of the subject, Mr. Moore eaid:

Claseification of Edible Mushroome.

Let us now suppose that you are going in quest of edihle mushrooms. Briefly, let me give you the orders:

First—Will come such as have a cap, or *pileus*, as it is called, with platee or gills on the under side of the pileus, with a stem, with or without a ring. This is the characteristic in general of the order of *Agaricini*.

Second—Such as have a pileus or cap, and instead of gills have pores or tubes on the under side of the pileus, the characteristio of the order of *Polyporei*.

Third—Such as have a pileus, and, instead of gills or tuhes, have spines on the under side of the pileus; characteristic of the Order of *Hydnei*.

Fourth—Such as have a pileus, hut neither gills, pores or spines, but the whole cap is crumpled up or folded into lohes; characteristic of the order of *Elveltacei*.

Fifth—Such as resemhle coral, *i. e.*, are hranched, the hranches heing unequal, elongated, mostly acute, pure white, sometimes violet at the hase; characteristic of the order of *Clavarei*.

Sixth—Snch as are a simple ball, often attaiuing a large size, which, in age, breaks up into a powdery mass; characteristic of the Order of *Trichogastres*, nnder which is placed the so-called puff-ball.

You have hut to look a moment at any of your fungi to determine under which of the above orders it will fall.

With perhaps one or two exceptions, all edible fungi may he classed under some one of the orders just named.

Having now learned the order, we may proceed to learn a few of the most readily dietinguished species under each order.

The Earliest Appearing Muehroom.

To hegin with the first order, the *Agaricini*, I think that the earliest appearing mushroom in thie city may he found in our plazas.

As it pushes it snowy white cap up through the grass it looks like a large long egg. Soon the top turns to a brownish hue and the skin breaks up into hroad scales, and the flesh splits open, revealiug its pure pinkish tint. The gills are long, numerous, pinkish, and on hreaking open the cap the stem falls out. The stem is hulhous and has a movable ring. As soon as the plant matures it turns into an inky mass. Don't eat it then. When young it is very tender and delicate, and taetes eomething like vermicelli. It is called the shaggy Coprinus (*Coprinus comatus*). *A good way to cook these*, or, in fact, any mushroom, is to *bake them under* a glsss or basin, on toast, along with a little scalded cream or melted butter. Add a clove, some salt and pepper to taste. Cook for 15 minntes in a gentle over, and when done allow the cover to remain on for a few minutes till all the aroma has heen absorbed by the toast.

A great many other spccies helonging to this orde: make their appearance soon after the one just mentioned.

Of the gill-bearing mushrooms wbich may be eaten, there are to he found in this vicinity 42 species. To describe all these would take too much of your time.

The Market Mushroom.

The common mnshroom of our markets, which to most people is *the* mushroom, I need only allude to. It helongs to the *Pratellæ*, or pasture mushrooms, having hrown or hrownish purple spores. It helongs in our botany to the *Psalliota* (from *psalion*, Greek, a rink), as it has the veil fixed to the stem and forming a ring.

There are two or three varieties to he found in our markets.

At first they push up through the ground as small huttons, or like little puff halls. (They are at their hest in this condition.) The cap is smooth or slightly scaly, generally when young, white, then hrownish or tawny. The gills are at first pallid, then flesh color or pink, then hrown, then tawny hlack. The stem is white and has a well-marked ring. In our most common variety the ring, however, is fugacious. I have not yet fonnd ahundant the common English mushroom, *Agaricus campestris*, growing wild upon our hillsides; hut in its place the closely allied *Agaricus arvensis*, which in England is called "the horse mushroom," or that other which is known as *Agaricus pratensis*. They are all easy of cultivation, and ought to receive more attention in this respect, though I confess that for me they are among the pooreet mushrooms of my gathering.

How to Dry Muehrooms.

I wonld recommend drying them for use when mushrooms are not ahundant. To dry mushrooms, wipe them clean, peel off the skin and take out the gills. Lay them on eome paper and put them in a moderately warm oven to dry. When dry put them in cans or paper bags, and keep them in a dry place. When wanted, put them into cold gravy and bring them gradually to a simmer. They will thus regain their size and taste,

A Highly-Prized Mushroom.

Later in the season, from January to Marcb, may he found a solitary mushroom, which to one unacquainted, is always classed as a toadetool, and yet, thronghout the world, it is highly prized. It ie so prominent when it hreake through the ground, and its characteristics eo marked, that it may he easily known. I have never seen it in our market, though I have gathered it on the hills hy Lone mountain and southward. I allude to what is known in the botany as *Agaricus procerus;* the Parasolschwam of the German, the Columelle of the French, the Rubhola Maggiore of the Italian, or the Cogomelee of the Spaniard. The pileus, when young, is globose, when expanded in age, sometimes being from eix to eight inches across, and covered with a thick skin, which hreaks up into scales, which are large, raised and persistent at the center. The flesh is white. The gille are very remote, *i. e.*, separated from the stem, and of a pale flesh color. The etem is tall, hollow, hulhous, tapering upward, and variegated with closely pressed scales. The ring is movahle, *i. e.*, will slip up and down on the stem. On removing the stem a large hollow or eocket remains. The odor of this mushroom reeembles that of fresh meat. The taste is mild.

It is preferred hy many to the common mushroom, as having a finer flesh, and more easy of digestion. For catsup it is unsurpassed. It is quickly cooked, and may he eerved with chicken fricasse. It may be hroiled or cooked in a close-covered dish with fine herbe, pepper, salt and hread crumhs. The etem is too leathery to he eaten.

How to Make Mushroom Ketchup.

I will here add *a simple method for making ketchup*. To a peck of mushrooms chopped fiue add one-half pound of salt. Let them stand for four days and then etrain and pass through a cloth. Allow the liquor to settle and pour it off into a stew-pan. Add now one-quarter ounce of allspice, one-qnarter ounce of whole pepper, and a small piece of ginger. Boil the whole one-half hour, and when cold, bottle.

Other Gill-Bearing Mushroome.

I will speak of hut two species more of the gill-hearing mushrooms. I mention them, as they helong to a different subdivision from those which I have mentioned.

The first one to which I will allude possesses a milky juice, and hence the genue ie called *Lactarius*.

The characteristics of this are so marked that it never need be mistaken.

The pileus ie fleshy, *zoned* (this is true quite generally of the order)—two to four inches across; color, reddish orange. The skin is smooth and viscid. The center of the pileus is depressed, and the zones are of a darker color than the center. The edge ie smooth, and when young is rolled in. The gills are of the same color ns the pileus, run down the stem, and are firm. The stem is two to three inches in hight, stuffed, then hollow and spotted.

When the gills are hroken, the milk is at first of a red orange hue, then, on exposure, it turns green. This fact must not he overlooked. If the milk is white, it ie as well to let them alone.

One fungus is known in the botany as *Lactarius deliciosus*, and it well deserves its title. A good way of cooking them is as follows: Mince as many of them as may be required, and fry them in a pan with a piece of butter, stirring them about meanwhile. When done, strew over them salt, pepper, parsley, chopped fine, a small piece of shalot and a little flour. And, finally, if you choose, a glass of champagne or cherry, and a little lemon juice.

A Yellow Mushroom.

There is a heautiful little yellow mushroom, known all over the world as the Chantarelle, which is occasionally met with here, though about San Rafael and northward it ie more common. It ie highly spoken of by all lovers of mushrooms, many preferring them, when properly cooked, to the truffle. It may he easily known hy its brilliant yolk of egg-yellow pileus, which is at first convex, then, as it grows older, is funnel-shaped. The gills are thick, swollen, branched, and of the same color as the pileus; the stem is tough, solid and of the same color as the pileus. Our fungus is known hy the name of *Cantharellus cibarius*.

If etewed, they must he slowly cooked; otherwise, they will he tough.

Fried in hntter or cooked in any of the ordinary forms, they are delicious.

Porous and Tubular Mushrooms.

I will now pass to the eecond division, tbose which have no gills, hut in their place are pores or tnhes.

There are a great many representatives of the *Polyporei* on our hillsides and among the oaks or other woods. Of one, only, will I etop to speak in this article. That is quite common about Lone mountain, at Oakland, Saucelito and San Rafael. It is called *Boletus edulis* or the *Edible boletus*.

It is a mushroom of ancient renown. Dr. Badham says of it: "The ancient Romane were well acquainted with thie truly delicious fungus, and in general appear to have done it justice." The cap is of a reddish or russet hrown, from three to eix inches across. The flesh when cut remains white. The pores or tubes are at first yellowish, then greenish. The stem is always thick, solid and ringless, and beautifully reticulated near the top. Bearing in mind the above, there is no danger of mistaking it. If your fungus, on heing cut, changes to a hluish, greenish or blackish, it is best to reject it.

As to its properties, I can only say what has always been said nf it: "Whether boiled, stewed with salt, pepper and bntter, fried or roasted with onions and hutter, this species proves itself one of the most delicious and tender objecte nf food ever submitted in the operation of cooking." I will add hut one method of cooking them, as given hy Paulet: "Having dried some of them in an oven, soak them in tepid water, thickening with toasted hread till the whole be of the consistency of *puree*, then rub through a sieve, throw in some which have been firet etewed, boil together and serve with the usnal condiments."

Spined Muehrooms.

The next class to which we come incldes such as have as stated spines or teeth on the under side of the pileus—the hydnee.

I helieve that nearly if not all the species of this order which are fleshy are edible—*Hydnum coralloides*. The coral-like hyndum is one of the most common. It grows on oaks, generally fallen trees, and looks like a large white maes of coral. In age it turns a light hrown. It may safely he eaten when young.

Hydnum repandium is occasionnlly to he met with. The pileus is yellowish or reddish, large, wavy, flesh white. The spines are pale yellow, and of unequal length. The stem is solid, and often out of center. There is not much chance of mistaking the fungus. Stewed slowly; it is excellent. It is good to dry these, as they may be kept for future use. If dried, these as well as other fungi mentioned, may he powdered and put in close cans. This is what is sold as mushroom powder, and is excellent for thickening soups.

The next division, *Elvellacei*, is well represented here. We have of edible speciee six, the most common being gyromitra esculenta. The cap of thie is hlack or cinerous brown, and looks like a crumpled mass. The stem is of a dirty white, and full of holes. It hns no gills. I know of no more savory dish.

The edible morell is also found hcre, and differe from the last, in that the cap is generally of a conical shape, and more or lese pitted. It ie a luxury in any part of the world. They are easily dried, and would bring a great price in onr market if once known here. There are so many ways of cooking them that I despair of mentioning them. Stuff them with veal stuffing and anchovy sauce, and dress them between slices of hacon, if you wish a good dish.

Of the *Clavarei*, which have neither cap nor gills, hut are branched ae coral, and smootb, I say hut this, that we bave one or two edible species, but they are so rare as to be of little consequence.

The Puff-ball Mushroom.

We now come to the last division, the *Trichogastres*. In the course of a day or two after our first raine may be fonnd on our dry and southerly exposed billsides, in fields or paetures, that lsrge, white-looking, leathery-feeling hall which is called the puff-hall. This is the *Lycoperdon giganteum* of the boteny. It is the most easily recognized and the best known of the so-called toad-stools. Whenever you see it once you will always recognize it hy its size, often growing to 10 or 20 inchee in diameter; hy its smooth, leathery-feeling ekin, varying in color from snow-white to almost hlack; and by its pure, soft, white flesh when it is young. Cut it oper, and if you see no yellow stains within, take it home at once. You have secured a good, wholesome dish; it may he enough for an entire meal for three or four pereone.

Bear alwaye in mind that this, like any other mushroom, is to be eaten only when fresh, never when there is any yellow within, for then decay has begun, and it is no more to he served up than you would serve up a rotten potato.

As with us here, it is the first to come, so I regard it the simplest and surest for beginners, and ns safe to eat as good Irish potatoes. "When fresh and properly prepared, it yields to no other in digestihility. It may he cut in thick slices and broiled as a good steak, or in thin slices dipped in egg and hread crumbs and well fried; eo prepared, it has the flavor of a rich, light omelette." When cut in slices and fried, it is excellent for use at nny time.

I have aimed in this to show you only a few of the most common and easily known of our mushrooms. I do not know that any of the species mentioned, save oue, ever appear in onr market. They ought all to appear, and there is no reason way we ehould be importing mushroom cateup, when we have ahnndant material with which to make it here.

Now, if one will not learn the edible species, and will persist in eating old and and large specimens, it must not he surprising if now and then a case of poisoning occurs. *Bear this in mind: All mushrooms are better and healthier when young.*

Antidotes for Poisoning from Fungi.

In case of accidental poisoning from fungi, the symptoms usually are dizziness, nausea, purging, perspiration, with alternate cold spells. These generally appear soon after eating a poisonous fungus, say from one to five hours.

The simplest remedy, to he used at once: Two wine-glasses full of whieky and sweet oil (equal parts). At any rate use eweet oil liherally. Or give a strong emetic, after which give a purgative with one-half to one fluid drachm of ether in a glassful of weak hrandy or water.

Economic Value of Mushrooms.

A word now as to the economic value of mushrooms. The cultivation of mnshrooms in the region of Paris has arisen to great proportions. Ahont 70,000 pounds are daily produced, yielding nearly $2,500,000 per annum. One

proprietor, whose beds ars in tbe qnsrry at Merv, bas under cultivation over 21 miles of mushroom beds. Another at Frepillon one of nearly 20 miles. Besides these caves there ars many others at Moulineaux, Saint Denis, Mont Rouge and Vitry, and thie may serve to give some idea of ths extent to which the bueinese is carried on in that country.

Works on Mushroom Culture.

For a full acconnt of the methods to he pursued in cultivation, I would refer you to *Supplement No. 178 of the Scientific American;* also to Cuthill's "Treatise on tho Cultivation of the Mushroom," and "Robinson on Mushroom Culture," London, 1870; also, "Fungi, their Nature and Uees," by Cooks and Berkeley, New York, 1875.

The following list of worke may bs useful to those desiring to pursuo ths study of edible mushrooms: "Hymenomycetes Europæi," Elias Friee, od. 1874; "Outline of British Fungology," M. J. Berkeley (plates); "Hand Book of British Fungi," M. C. Cooke (illastrated); "A Plain and Easy Account of British Fungi," M. C. Cooke (plates); "The Esculent Fnaguses of Eagland," C. D. Badham (plates); "Mushrooms and Toadstools," W. G. Smith. Tbere are two large charts accompanying this oae of edible aad poisonous mushrooms. "Scottish Cryptogamic Flora," R. K. Grevillo, 1821 (plates); "Sowerby Colored Figures of English Fungi," 1797, 1815; "Iconographic des Champignons," Paulst (270 colored platcs), Paris, 1855.

The Engineer.

Giant Steamships.

For some years it bas seemed as if tbs limit of size in oceau etcamships was to be fixed at about 5,000 tons, It was clear that the *Great Eastern* was a gigantic failure, a costly elephaat on tbc hands of her owners. She could not bs rua as an ordiusry passenger or freight steamer, aad found only temporary employment in the work of laying subinarine cables. Whether shc can he utilized as a traasport for cattle to Europcan markets, as recently proposed, remaias to he proved; but it is certain tbat such a sbip would not be *built* for that purpose—or indeed for any other at the present time. She may therefore be left out of tbc account, except as a warning tbat tbere *is* a limit of size, at least so far as economy of construction and working is concerned.

Steamships of 5,000 toas have been running for eoms ten yeare or more, but their number bas increasod very slowly, and until witbin a year or two there has been no disposition to build larger vessels. Then came the *Gallia* of tbe Cuaard liae aad the *Arizona* of the Gnion line, the formsr beiag 5,200 and the latter 5,300 tons. The *Orient*, for aa East Indian line, soon followed, with a measurement of 5,386 tons. The euccess of tbese great ships, especially in regard to spesd, coupled with the ambition of companies to outdo their rivals, appears to bave given a new impulse to thie branch of naval architecture, and two sbips are now buildiag which ars to be much bigger tban the biggest of their predecessors. One of tbese is a Cunarder, and is to be of 7,500 tons and 10,000 horse-power, her dimensions beiag 500 feet in length, 50 fset in breadth 41 in deptb. No eooner had the Cunard Company announced their intention to build a vessel second in point of size only to the *Great Eastern* tban the Iadian Company determiaed to bave a steamship of even larger dimensions. The vessel is to he built at Barrow, and ie to hs of about 8,000 tons, but ber exact dimensions havs not heen puhlished as yet.

It may be iateresting to compare these ships with the *Great Eastern*. The length of ths latter on the water-liae is 680 feet, extreme breadth 82 feet 6 inches, and depth 58 feet. Her tonnage, according to builder's measurement, is 22,627 tons; hsr register tonnags, incluciag engiae space, is 18,914 tons; and ber register toanage excluding engine epace, is 13,343 tons. She bas stowage for cargo to ths extent of 6,000 tons, and the capacity in her coal bunkers is 10,000 tons. Her draft of water when ligbt, is 15 feet, and loaded 30 feet. She hes accommodation for 800 first-class, 2,000 secoad-clase, and 1,200 third-class passengers, but if required for troops alone ehe could carry 10,000 men. It will thus be seen that the *Great Eastern* is in point of size considerably ahead of anything yet ventured by shipowners, and though there is an evident desire to increase the sizs of ths great ocean steamere her position as the largest afloat is not likely to be disputed.

Railway Extension in India.

Witb the exception of the United States, and possibly France, no country of the world appeare to be so actively engaged in the extenеion of its railway system as India. It bas long been understood by those at the head of Indian affairs, that the stability of Eaglish dominion and the development of ths resources of the Indian empire are dependent upon a rapid extension of railways. Thsir great value during recent complications in Afghanistan bas ehown this. The interests of India, whether at war or at peace, demand increased railway facilities. Very little ie known in this country ahout tbe recent work done ia India in this direction, and it may be of iuterest to places before our rsadere eome facts drawn from a government report by Juland Danvsrs, for a copy of wbich we aro indebted to Meesrs. Matheson & Graat, engincers, London. On tbo 1st of January, 1878, India posecesed 7,220 miles of road, to which duriag thc year were added 995 miles, built almost exclusively by tbo state. On the 1st of Jaauary, 1879, 1,021 miles wers sither sanctioued or in course of construction, and it is more than probable that an equal mileage will be added dnring thc comiag yoar. The anaual consnmption of raile in that country for new lines will tbereforo not, in all probability, fall short of 100,000 tons, tbe greater bulk of which would be steel. In Jaauary of the present year more than 13,000 tons were shipped from Eaglaad to India.

Useful Information.

Artificial Fuel.

In France tbey use for fuel a material wbicb is ostensibly tablets of pressed peat, but which is more generally made of etable sweepiags, it is said. Similar *mottes*, made of camsl's dung, aro used for cooking in Algeria and all over the oasis of Sahara, for wood is thers too scarce to bs used for fuel. The motte makes a clear, odorless, eootless, and almost smokeless firc. All early overland omigraats to California must be familiar with the "buffalo chips" which formed such excellent material for fuel—they were natural mottes, similar to those above referred to.

Compressed peat in London, and indeed in a'l tbe large towns of Great Britain and Ireland, is rapidly coming into use. The cakes tbere are made in great blocks, while tbe French mottes ars only about six inches long by four wide and two thick. On tbe Bslfast and Nortbern railway of Ireland tbe compressed peat has heen tried with great eatisfaction. Tbe engineers report that 21 pounds of peat raises steam for a mile of transit, 26 pounds of coal being required to do ths same work. They prefer it, moreover, because eo clean to baadle and eo ligbt compared to coal. Its cost ie lese than one-half tbat of coal. "In tbe manufacture of gas," says our *Scientific American*, "as compared with coal, its illuminating powers are tested and put down at 342 to 100. So tbe rich and practically inexhaustible bogs of Irelaad promise to bring back prosperity to that country. The drying and compressing of this substaace render its transportation cbeap and easy, and as it is superior to wood in maay respects, and less expensive, tbere is no apparent reason why it sbould not bs very extensively used. A charcoal is also manufactured of the Irish peat, and the compressed cakee are in great demand for land fertilizing."

Rats.—Rats are a great nnisance in any house, and it is perfectly proper to war agaiast them in every conceivable way. The *Scientific American* gives the following method of riddiag a bouse of tbem. It has one advantage, that, if not successful, the benefit of cleanliness and disinfection ie at least eecured: "We clean our premises of these detestable vermin by making wbitewasb yellow with copperas, and covering the etones and raftsre in the cellar with it. In every crevice in which a rat may tread, we put crystals of the copperas, and scatter the same in the cornere of the floor. The result was a perfect etampede of rats and mice. Siace that time not a footfall of either rats or mics has been heard about the houss. Every spring a coat of the yellow wash is given the cellar—as a purifier, as a rat exterminator—and no typhoid, dyeentery or fever attacke the family. Many nersons deliberately attract all tbe rats in the neighborhood by leaving fruits and vegetables uncovered in the cellar, and sometimes even tbe soap is left open for their regalement. Cover up everything eatable in the cellar and pantry, and yon will soon have tbem out. These precautions, joined to the services of a good cat, will prove as good a rat exterminator as the chemist can provide. We never allow rats to be poisoned in our dwellings, they are so liable to die between tbe walls and produce much annoyance."

Imitation Stained Glass—A New Idea.—A few years ago stained glass windows were rare in this country, even in churches, except among tbe ambitious and costly of those of two or three denominations. Now ornamental windows are comparatively plenty, not only in churches, but in other public and private buildings, and would he more common in ordinary dwellinge wsre the cost within the ecope of ordinary purses. The growing taste for this sort of color decoration cannot fail to be materially advanced by the cheap and very successful imitation of stained glass effects now comiag into use. Thin sheets of silk paper sre printed with brilliant oil colors, in varied artistic patterns; and whea pasted upon common glass wiadows they produce all the brilliant effects of costly colored glass. The color sheets can be applied witbout skilled labor, and show a great advance in decorative effects over ordinary curtain shades or blinds. The inveation has been patented, and we predict for the product a large demand.

To Remove Old Paint from Wood.—A stroag aqueous solution of caustic potasb softens oil paint, which in this state may be removed by scraping. Tbe potash is, however, liable to injuriously affect the wood, aad must be used with great care, as to the strength of tbs eolntion.

Fire-proofing Cotton Fabrics.

In a paper on some conditions of inflammability, read before a sanitary convention in Michigan, Dr. Kedzie, of tbe State Board of Health, said tbat cotton clothing could bo prevented from takiag fire by the use of borax in starcbiag—a teaspoouful to each pint of starch, after the water has been added. The borax can have no iajurious effect upon tbe cloth or upon tbe wearer, and is so cbeap tbat all can afford to use it.

Dr. Kedzis showed by experiments that mnslins and tarletans, tbe most inflammable goods, when treated witb borax starch, could not be made to burn with a blaze. If all cotton dresses and underclotbiag, and especially tbe clotbing of cbildren, were treatsd in this way, a great number of lives and much suffering would be saved every year.

Dr. Kedzie said he expected tbat one of tbese days some sbrewd fellow would use this receipt, mix starch and borax, aad sell it as "asbestos starch," or witb some other catching uame, at 500% or 600% profit, and get rich out of it. The people could just as well do their own mixing and save the profit.

Brown Tint for Iron and Steel.—Dissolve, in four parts of water, two parts of cryetallized chloride of iron, two parts of chloride of antimony, and one part of gallic acid, and apoly the solution with a epouge or cloth to tbe article, and dry it in the air. Repeat this any number of times, according to tbe depth of color which it ie desired to produce. Wash with water and dry, and finally rub the articles over with boiled linseed oil. The metal thus receives a browa tint, and resiste moisture. The chloride of antimony sbould be as little acid as possible.

Fast Trains.—The Jersey City and Philadelphia train on the Pennsylvania road rune 89 miles in 111 minutes, or a mile in about 1.25 minutee. The Boston and Tannton train runs over tbe Old Colony road a distance of 34 miles in 47 minutes, or a mile in about 1.27 minutes; wbile 44 miles in 60 minutes, averaging 1.36 to the mile, are traveled by the Boston and Providence Sbore line express. These trains are among the swiftest in the world.

To Clean Wall Paper.—Soiled wall paper may bs made to look almost as well as new, in most cases, by the following expedient: Take about 2 quarts of wheat bran, tie it up in coarse flannel, and rub it over the paper. It will clean tbe whole paper of almost all descriptions of dirt and spots better than any other means that can be used. Some use bread, but dry bran is better.

Corks are made both air-tight and water-tight by being plunged into melted paraffine and kept there for about five minutee. Thus prepared, tbey can easily be cut and bored, and may bs inserted in or witbdrawn from bottles with great facility.

Good Health.

Danger from Bad Eggs.

At this season of the year it is often difficult to obtain eggs that are fresh unlese they are procured from soms farmer wbo will guarantee their freshness. During warm weather eggs speedily undergo cbanges akin to putrefaction. Tho shell but partially protects its contents from the destructive action of germs, unlese it is rendered impervious by the application of some substaacs capable of filling the pores eo that tbe air cannot pass through. An Englishman who has investigated the subject quite thoroughly, finds, upon microscopic examination, that stale eggs often contain certain peculiar cells of a fungoid character. These seem to be developed from the yolk of the egg, that portion which should furnish the material to form the flesh and bones of the chick which the egg would have produced by development under favorable conditione. Eggs containing tbese calls produced a poisonous effect upon dogs to which tbsy were fed. We knew a case in which a whols family were seized with violent purging in consequence of the use of stale eggs; at least the difficulty could bs assigned to no other cause.

Egge grow lighter as they grow older, by ths evaporation of tbeir fluid contents, causing the internal portion to shrink. Tbie leaves a small air epace at one end, which becomes larger as the egg is older, and if it is very stale it will float when placed in water. Such eggs should he discarded as unfit for food.—*Good Health.*

A Hint to Mothers.—A lady who expressed surpriss at seeing the children of a friend exposing themselves to taking a cold by recklessly wetting their feet, when asked if her children did not do the same tbing, aaswered: "No; I've managed to make my three hoys believe that it is vulgar and ungentlemaaly either to get their feet wet, or sit in a thorough draft, or bolt their food, or eat goodiee between their meals, or go to juvenile parties, poor dears. They're rather soft, perhaps, but they ars twice the size of any other hoys of their age, and they've never had an hour'e illness in their lives." Such motbers as tbis one are an honor to the world, and with more of them we should ses fewer sickly children and more robust onee.—*Herald of Health.*

Eye-Sight.

Milton'e blindness was tbe result of overwork and dyspepsia.

One of the most emiaent Americsn divines having, for soms time, been compslled to forego the pleasnre of readiag, has spent thousands of dollars in value, and loet years of time, in consequence of getting up eeveral hours before day, aad studying by artificial light. His eyes never got well.

Multitudes of mea or women bave made their eyee weak for life by the too free use of the eyesigbt, reading small print and doing fine eewing. In view of these things, it is well to observe tbe following rules in tbe use of the eyee:

Avoid all sudden changes between ligbt and darkness.

Never begin to read, or write, or eew for several minutes after coming from darkness to a bright light.

Never read by twilight, or moonlight, or of a very cloudy day.

Never read or sew directly in front of tbe light, or window or door.

It is best to have tbe ligbt fall from above, obliquely over tbe left sboulder.

Never sleep so tbat, on the first waking, tbe eyes shall open on tbe light of a window.

Too much ligbt creates a glare, and pains and confuses the sight. Tbe moment you are sensible of an effort to dietinguish, that moment ceaee, and take a walk or ride.

As ths sky is blue and the earth green, it would eeem tbat the ceiling sbould be a bluish tinge, and tbe carpet green, and tbe walls of some mellow tint.

The moment you are prompted to rub tbe eyee, that moment ceass nsing tbem.

If tbe eyelids are glued togetber on waking up, do not forcibly open tbem, but apply tbe saliva with the finger—it is the speediest diluent in the world—thsn wash your face and eyes in warm water.—*Exchange.*

Tbis hee been going around for abont ten years, and its ownership, we guess, is lost; bnt it is good enough to go on indefinitely.

The Uses of Lemons.—Lemons are easily raised in the southern part of the State, and if tbey possess half tbe virtues ascribed to them, no ono should fail to plant a few treee wherever tbsy will grow. An exchange eaye: "Lemon jnice is the best antiscorbutic remedy known. It not only cures the dissase but it prevents it. Sailors make a daily use of it for this purpose. A physician suggests rubbing of the gums daily with lemon juice to keep them in health. The hande and nails ars also kept clean, white, eoft and supple by the daily use of lemon instead of soap. It aleo prevents chilblains. Lemon is used in intermittent fevers mixed with strong, bot black tea or coffee, without sugar. Nenralgia may be cursd by rubbing ths part affected with a lemon. It is valuable also to cure warts, and to destroy dandruff on the head, by rubbing the roots of ths bair with it. In fact, its uees are manifold, and the more we employ it externally the better we shall find ourselves. Natural remedies are ths best, and nature is our best doctor, if we would only listen to it. Decidedly rub your bands, head and gume with it, and drink lemonade in preference to all otber liquors." Lemon juice ie also said to be an antidote for enake poison by pressing the juics into the bits and by eating the lemons. Many testify to the heneficial effects of lemons in pulmonary diseases, and consumptives have been cured by eating tbem freely every day. They will give immsdiate relief to tbe most troublesome corns and cure them if their use is persevered in. Hot lemonade is the pleesantest remedy known for colds, and lemon pie for hunger.

Injurious Effects from Vulcanite Plates. Samuel Sexton, M. D., in an article publisbed in the *American Journal of the Medical Sciences*, for Jaauary, 1880, states that vulcanite platse produce diseases that are more frequently the source of reflex aural disease than any otbers worn. Thsy have heen in nse for over 20 years, and tbeir adoption is very general. Tbe constituents of thie are caoutchouc, the sulphur rsquired in the vulcanizing process, the vermilion or the sulphide of mercury, used for the color it imparts. The quantity of the latter ingredient is believsd to be equal in weight to both the other substances mentioned; accurate knowledge, however, is withbeld by the manufacturers. The gradual disintegration of theee plates, as they are worn in the moutb, liberates a salt of mercury, whose poisonous effects ars well known. But besides yielding a poison, they are otherwiee injurious to health. Inquiries from dentists elicit the fact that at lsast one-tbird of all those who attempt to wear them experience great irritation of the mouth, an irritation that is frequently accompanied by hypersecretion of the huccal fluid. The sufferer usnally lays aside the plate until informed of ths necessity of becoming accustomed to its presence by uninterrupted use. Vulcanits is a nonconductor of beat, and the effect of its contact with the higbly sensitive tissues of the moutb is to produce hyperæmia and inflammation. Another source of iajury is the very close contact of these plates, which is maintained by atmospheric pressurs, and may favor the absorption of their substance.

Fainting at Sight of Blood is due to a very sensitive temperament, and an organization lacking in courage and stamina are at the bottom of this weakness. Lose of blood, in the mind of some, ie associated with suffering and death, and a dread of thess bas eomething to do with the faintnees.

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The Gutta Percha & Rubber Man'fg Co., S. F.
Delinquent Sale—Gover M. and M. Co.
Postponement—Atlanta M. Co.

The Week.

The rain has besn falling steadily during the week, making the hearts of both miners and farmere happy. There ie now every prospect of a good mining season and plentiful crops this year. To these two industries California looks for the bulk of her production, and when times are hard with them they are hard with all.

The mining excitement throughout the United States still continues, although in New York they have had a little "set back" in the Little Pitteburg of Colorado, which will scare some of them out of investing in stocks of mines. They ought to look more to dividende for profits, than to rise in value of etock.

It is worthy of note this week that, on looking over the papere published in the Territories, we see that there seems to be a regular "rush" of miners and prospectors. People are arriving by the hundreds and scattering over the hills in eearch of ore. Arizona will be well prospected this summer. Then will come New Mexico'e turn, where there ie room for many thousand miners.

This week closes the work of the Legislature, which, although it has accomplished a great deal of work, has not done so much as was expected, since many bills could not be reached.

THE Committee on Public Buildings and grounds of the House of Representatives have agreed to recommend the passage of a bill providing for the erection of a public building at Sacramento at a cost not to exceed $100,000.

THE six day walking match at New York cnded Saturday night, Hart being the winner, making 565 milee—beating the heet time on record.

A MILL is to be erected at Oroville for the purpose of extracting gold from the tailings by the Edison electro-chemical process.

DURING the firet three months of 1880 thers were 1,400 business failures in the United States, with liabilities of $12,000,000.

THE charges preferred against Judge Silent, of the Arizona Supreme Court, are scouted by the papers of that Territory.

THE gross earnings of the Central Railroad of New Jersey in 1879 were $7,000,000, against $5,500,000 in 1878.

The State Mining Bureau.

Assembly bill No. 415, better known as Wasson's Mining Bill, which provides for the establishment and maintenance of a State Mining Bureau in San Francisco, has passed both houses and gone to the Governor for signature. We have before this given the provisions of the bill in full.

It provides for a State Mineralogist, who is to collect and preserve, in San Francisco, geological and mineralogical substances, mineral watcrs, etc., properly identified and labeled, not only from this State but from others. The Mineralogist is to hold office four years and receive $3,000 per year and his traveling expeuses. When the funds in the Mining Bureau are sufficient, he is to provide and maintain a library of works on mineralogy, geology and mining, models and drawings of mining machinery, milling machinery, etc.; to correspond with established schools of mining and metallurgy, and obtain and preserve for public inspection such information in reepect to mining and milling machinery as will be practically useful to the people of the State. He is to visit the different districts of the State from time to time, and at the close of each year make a report to the Governor. Hs may appoint assistants, fit up rooms, etc., all to be paid out of the Mining Bureau fund, which fund is to be derived from the proceeds of taxes on mining corporations, milling compauies, ditch companies, etc.

We should have been hetter pleased to see the collection of information and etatietics come first, and that of geological and mineralogical specimens come last. The miners want information more concerning mining and milling than they do concerning minerals. Under the provisions of the act, however, it seems as if the mineral collection will be made first, although its greater or less prominence will no douht depend greatly on the person who is appointed by the Governor to take the position of State Mineralogist.

As we have before remarksd, a bureau of information concerning miniug matters is eadly needed here, and this is the first step which has heen taken hy the State in that direction, for which Mr. Waeeon deserves the thanks of the mining community. We still hope, however, that the collection of minerale will not be carried on to the exclusion of other work which will he of more value to the practical miner. The State has now large collections of geological and mineralogical epecimens at the Universsity which are ready for reference.

This Bureau can be made of a great deal of henefit to the mining community, if carried out by competent men having knowledge of mining mattere.

Nerve in Mining Matters.

There is a leeson in the collapse of the Little Pittsburg mining echeme aside from that which tsaches "all is not gold that glitters." It is that it takes some experience in mining affairs for the acquirement of that holdness and nerve which it takes to conduct them on a large scale. Private letters from New York etate that the mining fever has very greatly eubsided eincc the eudden fall in the stock of the Little Pittsburg, and several papers which have slightly encouraged mining investments, or rather said uothing against them, have come to the front condemning the whole buineee.

This was to have been expected. The people who have been dealing in railroad and manufacturing enterprises, and unaccustomed to a sudden drop of one or two hundred per cent. in their "security" would naturally become very much alarmed. On this coast, where we are used to such things, it would have made no great impression. The holdere of etock would have thought themselves out of luck, but would not on that account have determined to eschew mines forever after.

The rich men of California, who havs made their money from mines and mining stocks, have acquired by experience the nerve to take hold of minee, and where they lose in one instance they make it up in another. They know how to opcn and develop the mines, and to manage them afterwards. They do not manage their mines on a "picayunish" scale, but put their money in generously, with the hope and expectation of a generoue return. At the eame time, the Little Pittsburg matter may he useful to the Eastern mining investore. It will teach them not to look at etock values alone, as they fluctuate widely at times, while the real value of the mine they represent may remain the same. If a mine has no ore, it is of course worthless, while, at the eame time, the stock may be held high for the time. Again, the etock may be low, when the mine is really valuable. If they look to the proceeds from dividends as ths legitimate fruits of investment, rather than that gained from the fluctuation of stock, they will be ever eo much better off, as our experience here in California has abundantly proven.

GEN. HATCH has had a fight with Apaches in the San Andreas mountaine, New Mexico, which lasted six hours, and resulted in ths rstreat of the Indians.

The Mining Laws.

All our exchanges published in the mining districts of this and adjoining States and Territories are publishing articles from correspondents in their vicinities, condemning the proposed charges in the mining laws. Petitions to Congress asking that no changes be made are heing rapidly circulated and signed. We see that Senator Farley this week presented to Congress a memorial numerously signed by citizens of Mono county, Cal., and Esmeralda county, Nev., protesting against the paseage of the Public Land Commissioner's bill. The memorialiete say the enactment of thie bill would be eubversive of the hest interests of cheap mining; that instead of preventing litigation, it will increase litigation; that by its onerous conditions it will create a necessity of capital with which to do even surface mining; that it will entirely destroy the occupation of the proepector, throw thousands of poor miners and hardy prospectors out of employment, and retard for an indefinite period the development of a comparatively unprospected mineral helt which is believed to be rich in precious minerals. Representative Daggett has also received a large number of memorials of the same character.

In view of the great number of memorials on the subject and the expressions of the press, it would eeem ae though the Land Commiseion would recognize that they had made n falee etep, that they had taken up a subject superficially which required more care and thought than they had given it. We are glad to know that uothing will be done by Cbngress on the matter during the preseut season; since before the next season the whole eubject will be fully discussed and better understood. There will then be no danger of such radical changes being made as the hill proposes.

Death of Pioneer Miners.

The well-known mining prospector, Capt. John Moes, died in this city ou Sunday last, of a gunshot wound received from an Indian in the southern country. Deceaeed was familiarly known in all mining camps in the Pacific States, the Territories and Mexico. He was a prominent Mason, and received the wound which caused his death while protecting a hrother Masou from the aseault of an Indian. He came to thie city for treatment, ths ball having lodged in the lung, and euffered through a protracted illness.

O. P. Calloway, one of the pioneer ditch buildere of the State, was recently killed in Arizona. He wae connected with mauy ditch and canal huildiug enterprises in the mining counties of California.

James Barry, the man who etruck the ore channel in the Table mountain, Tuolumne county, the first discovery of the kind in the State, is dead. He came to California in '49, and engaged in mining on Mormon gulch, and was among the early prospectors in many localities in Tuolumne county.

J. A. Bonnefoy, a resident of Tuolumne county since 1851, has just died, and the *Independent* tells of him an example of perseverance and faith. He, in company with Felix Obnr, another Frenchman, have run over 2,000 feet of tunnel in prospecting Table mountain, mostly through basaltic rock formation. Thie work has extended through a period of ten yeare, almost without intermission, Bonnefoy furuishing the money and Obar the muscle. Several years ago they etruck a channel which prospected well—having given up the idea of cver finding a "back channel." They had recently gone to work and were taking out gravel to wash from their first find at the time of Bonnefoy'e death. Very few men, under euch adverse circumstances, would have stuck to the work eo long.

Another "Process" Failure.

The section around Grass Valley and Nevada City, which has become the "bone-yard of processes," from the fact that so many have heen tried there and failed, has now another fizzle to add to the list. The Murchie company, of Nevada City, a few months ago erected worke for the purpose of reducing their sulphurets by amalgamation, by a procese invented hy J. H. Smith. About $8,000 were expended in buildings, furnaces, apparatus, etc. We gave an account of the experiments when they were first tried. The Nevada *Transcript* now eays: "After a brief trial, the procese wae demonstrated a failure, and Mr. Smith, at whose recommendation the experiment is eaid to have heen made, was 'fired out' of the camp in a hurry. The company are still sending their sulphurets to San Francisco for treatment, ae formerly. They now contemplate reconstructing the works so ae to use the chlorination process, which after many years' teste nppears to be the best yet discovered. This latter change will entail an additional expense of some $2,000 on thc company, hut if rightfully managed it will afford them sure and profitahle means of extracting the gold from their ores."

THE Panama Railroad Company havs declared a dividend of 4 per csnt.

Low Grade Ores.

It is not by any means always the case that the high grade ore mines pay the best. Usually when it is pretty high grade, there is not so much of it; and there beiug less, the quantity taken out costs more in proportion to extract. A mine with a good fat ledge of medium or low grade-ore and plenty of it, is a much more eatiefactory piece of property than one with hunches or patchee of very rich ore, or a thin ledge. Of the many hundrede of mines we hear of with ore assaying into the thoueands, how few there are which ever amount to much permanently or ever become great mines. When a man finds a claim and takes out a few pounds of rich "specimens," he has by no meane made hie fortune yet. Ore that assays $5,000 and $10,000 per ton, as a general thing doee not "stay." Ore assaying $10 or $20 per ton, in a gold country is very much more likely to pay best in the long run.

The "glittering ore" that we read about is not always the beet to find. Specimene of "free gold ore" are very handsome to look at, but much scarcer than that which ehows no eigns, but holds it none the less.

Until within a ehort time the miners in this State have devoted their energy too much to hunting for high grade ores only. Now, however, ledges of fair eize that will run from $7 to $14 per ton are not by any means conaidered worthless. With all the improved appliauces for heneficiating ores, and the long experience of the mill men, this clase of orca will pay very well indeed. In fact the mines of this class are really much better than the rich "knife hlades" or pocket leads, so much sought for of old.

Capitalists would rather iuvest money in putting up works on a mine with an abundance of medium or low grade ore, than in one with a scant quantity of very rich ore; and the very rich ore ie always scarcer than is eatisfactory. Prospectors should bear these facte in mind, and not pass over as worthless a claim which doee not at first show ore which is ae rich as they would like to see.

Legislative Matters.

Senate bill No. 482, for the hetter preservation of fish by providing and maintaining fish screens at the heads of mining and irrigating ditches, has heen passed.

The following bill, passed by the Assemhly, will prohably bo passed by the Senate: Water-ditchee constructed for mining, manufacturing or irrigation purposes, and wagon or turnpike, toll-roads or telegraph lines, must bs assessed the same as real estate hy the assessor of the county, at a rate per mile for that portion of such property as lies within his county.

Waseon'e Mining Bureau bill, elsewhere referred to in thie iesue, has passed both houses.

The long-discuseed debrie and drainage bill has finally passed and now goes to the Governor for signature. In the Senate the amendment to Section 5, providing for the appointment of a resident engineer in each drainage district, was concurred in.

The amendmente to Sections 16 and 17, fixing the district levy at one-twentieth of one per cent., instead of using the worde, "not to exceed," was finally concurred in.

The other amendments relative to using all moueys raised under the act for impounding the debris, etc., were concurred in without debate.

Braunhart's bill to suppree etock gambling, when it came up in the Senate, was vigorously diecueeed. Neumann, Sears, Hittell and Conger made vigorous speeches in opposition. They pointed out what they called the moustrous proviciens of the measure, which clothed the Mining Commissioner with unlimited power to open the way for the formation of the most powerful stock ring that could he organized. Neumann also pointed out a provieion requiring the mining corporations to make a weekly report every month, and Sears showed that the bill required a etock hroker who failed to give a bond for the collection of licenses to be sued on hie bond.

The bill wns defeated, not receiving the constitutional majority—ayes 17, noes 16.

CAVE CREEK, ARIZONA.—Great activity prevails in and about the Rone gold mine. Ths ledge is nearly eight feet in width, in ore which averages over $100 to the ton. Cave Creek district is very lively in consequence. Several mines have been eold and bonded recently. Proepectors are arriving daily from California, Arizona and Nevada. All are well pleased with the outlook of the new camp. Gen. Vernon is Superintendent. The smalleet mill is to he erected at the mine, the larger one on Camp creek, eome three miles from the property. This valuable mine was recently purchased from the Rone and Regan families by Generals Crook, Kautz, Vernon aud Messrs. Snider and Gibson, of California, who are exceedingly pleased with their investment, and are satisfied that the property is *immensely rich*. The ledge rune north and south, granite formation, and has fine clay seams on the hanging and foot wails. Good judges pronounce *it a true fissure vein*, and one of the moet valuable mines ever opened on the Pacific coast. It is certainly very rich in free gold; only traces of silvsr; no rebellious mstal whatever.

Mines and Mining in Nevada County.

As is probably well known to most nf nnr readers, Grass Valley claims the distinction of having bcea the place at wbich quartz mining and milling wcro inaugurated in California. Tbnt the first gold bearing veins in the State were here discnvered, located nnd opened up admits of no qucstion; it being nearly as well settled that the pioneer crushing mill nn the Pacific coast was built and commenced operatinn nt this place. When the writcr arrived on the spot where the town of Grass Valley now stands, in the month of Marcb, 1851, there were already three establishments nf this kiud in nperation here, Judge Walsh having put up tbe first one the preceding winter. There was at that time considernble excitement on tho subject of quartz, many of the gold diggers having abandoned the placers for the purpose of engaging in this brnnch of mining. For a while, and until the stubborn sulphuretcd ores were reached, the business paid fairly. After that it fell into decadence, only such lodes as afforded tolornbly free milling ores continuing to pay for working. Of these, however, there were a number, some of which have, through their large and profitable production, come to rank among tbe historical mines of the State. In this category stand

The Allison Ranch, the Eureka and the Idaho,

All of which have distinguished themselves in this respect. The Allison Ranch from 1856 to 1867 inclusive, turned out gold bullinn to the value of $2,300,000. This production was made from 46,000 tons of ore, wbich yielded at the average rate of $50 per ton. Of the above total about two thirds were net profits. The Eureka, during the 12 years preceding, Aug., 1877, produced something over $4,600,000, of wbich $2,134,000 were disbursed in dividends, the ore from this mine having averaged nearly $50 per ton. The pay chimney in the Eureka having been exhausted several years ago, the work of exploring for new ore bodies, kept up for some time after, was finally given up, and the mine may now be considered abandoned. The gross product of the Idaho mine for the past 11 years approximates $6,000,000, of which nearly one-half has consisted of net earnings, while it has turned out a vastly greater quantity of ore than either the Allison Ranch or the Eureka, the Idaho ore has been of much lower grade, having averaged only about $20 per ton. The average of the 32,370 tons worked last year was but $15.42 per ton, the cost of mining and milling having been $8.42 per ton. Tbis mine is now opened to a depth of over 1,100 feet, and the ore is said to be improving both as regards quantity and grade. The company are running 35 of their 50 stamps. Among other of the

Older Claims in this Neighborhood

That have in times past made a creditable record, the Empire, North Star, Gold Hill, Massachusetts Hill, the Houston, Osborn, Cambridge, the Providence, the Banner and the Soggs are prominent, the production of some of tbese having run up into the millions. The most of them have had a somewhat cbequered career however, the ore here occurring largely in pockets, chimneys and other capricious forms, the exhaustion of which has tended to continually vary the fortunes of the mines. In some cases the fluctuationa experienced have been due to causes not connected with the character of the ore bodies. The Gold Hill mine, the first ever discovered here, turned out, during the 14 years it was actively worked, over $4,000,000. Sometimes the ore would be so interlaced with gold that it had to be crushed in hand mortars, and then for a time it would be too poor to pay current expenses; the most profitable mines here in the long run having been those in which the ore showed very little gold to the naked eye, such as the Eureka, Murcbie and Idaho. The Massachusetts Hill mine, supposed to be on the same lode with the Gold Hill, has yielded nearly as much as the latter. A very mournful event is connected with the early history of this mine: Michael Brennan, who had been engaged as superintendent, opening it for the Mount Hope, an Eastern company, failing after several years' labor to develop anything of value, in a fit of despair poisoned first his wife and three children and then killed himself with a pistol. This occurred in 1858, and within a year or two after a very valuable body of ore was opened up only a few feet from the bottom of the shaft where the unhappy man had done his last work prior to a final suspension of operations. Had he continued sinking another day he would probably have struck into this rich ore and thus bave saved the property to his employers and saved himself and family from their pitiful fate.

It is a Noteworthy Fact

Connected with tbe history of the mines here that the district has never been without one or two largely productive properties. From 1851 to 1855 there were not less than a dozen claims that yielded remarkably well. In the latter year the Allison Ranch mine commenced to make bullion freely. A year or two later, and before it began to wane, the Eureka was in the ascendant; and long before this famous old mine had been exhausted of its ores, the Idaho came to the front; and now, as its contents undergo gradual impoverishment, there are still a number of mines in course of exploration, either of which promises to well nigh and may even more than fill its place of these new aspirants to distinction.

The Providence

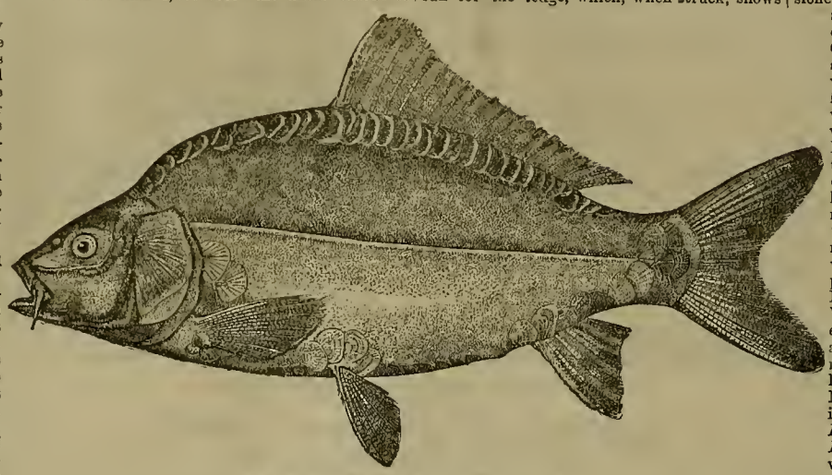
Claims first our attention, both because of the many difficulties with which the owners of the ledge have had to contend, on account of the refractory character of the ore, and of the rich developments lately made in its lower levels. This mine, which has been in course of exploration for many years, has been opened with system and thoroughness to a depth on this incline of more than 1,000 feet—the lineal extent of drifts, drains, tunnels, etc., run in the course of explorations amounting to some 12,000 feet. Five ledges, varying from 3 to 14 feet in thickness, have been opened up, and as much as 500,000 tons of ore developed in the mine, two-thirds of which will pay a good profit on reduction. There are at present only about 40 tons of ore being extracted from the mine daily—sufficient to keep the 20-stamp mill of the company employed. The number of stamps are to be increased to 60 or 80 the coming summer, after which the quantity of ore reduced will be increased in like ratio. The bulk of the ore here is combined with sulphur and other refractory minerals to an extent that necessitates roasting and the employment of the chlorination process for its effectual reduction, this method having been found by the owners of the mine the most satisfactory, after nearly $100,000 spent in making trial of other plans. The Providence is a big mine, with a prosperous future before it, and, as the company have evinced a commendable spirit of enterprise, as well as shown a wonderful degree of perseverance and patience, many will rejoice at the promising aspect of their affairs.

The Old Murchie Ground,

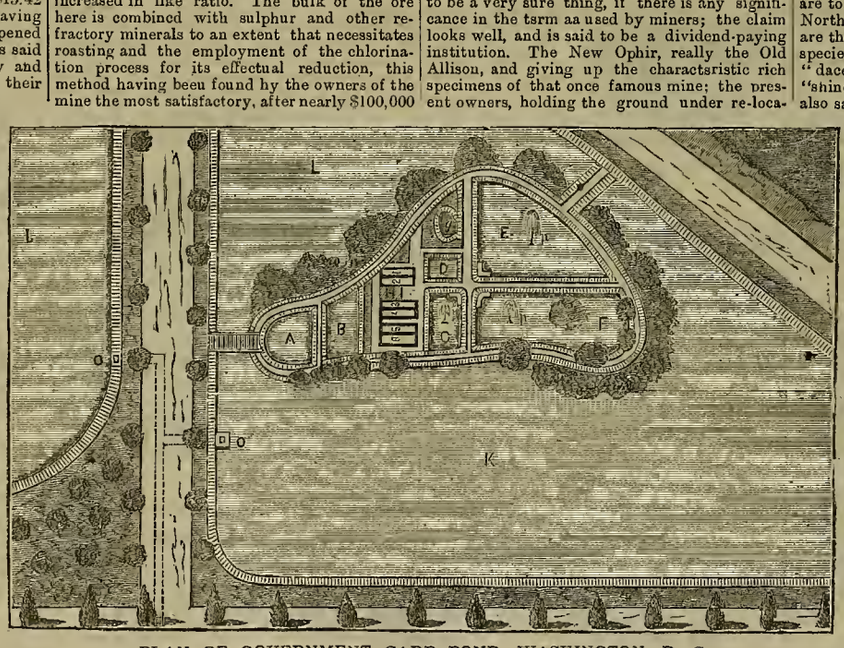
Situated near Nevada City and five miles northeast of that place, under the application of steady work is growing into a good property, ore extraction and reduction, exploration, mill building and various other improvements having been in progress for several years; to these there is now to be added hydraulic washing, there being extensive banks of good gravel on the company's lands with three ditches constructed for bringing water upon them. These gravel deposits are already opened and outfitted with pipes, sluices, etc. The quartz lodes, of which there are several, have been well opened and furnished with a crushing mill of large capacity, concentrators, chlorination works, etc. They have here large quantities of ore that will yield from $8 to $10 per ton in free gold, besides nearly as much more contained in the sulphurets.

Among the Notable Mines Hereabout,

But belonging to developments of a later day, we have, first, the Live Yankee, now called the Fortuna, an active, thrifty concern, as its double name denotes. This claim is located on the same lode, or at least stands in the same mineral range, as the Providence mine, from which it is not far distant. The lode on which it is located having been traced by its croppings a distance of four miles, has since been identified throughout by exploratory work done continuously along it. Work on this ground is being prosecuted vigorously, a vertical shaft having been put down and drift from its bottom run for the ledge, which, when struck, shows great strength, and is well stocked with high grade ore, even better than was found at points above. The property is owned by strong parties, and can hardly fail to develop into a first-class mine. In this category we have also the Alpha, situate near and running parallel with the prosperous Idaho, the Kirkham & Hitchcock claim, a recent discovery, yielding rock so exceptionally rich that the owners realize big wages working it with only an arastra and hand mortar; the Mohican, turning out ore that goes about $30 to the ton; the Deadwood, that ought to be a very sure thing, if there is any significance in the term as used by miners; the claim looks well, and is said to be a dividend-paying institution. The New Ophir, really the Old Allison, and giving up the characteristic rich specimens of that once famous mine; the present owners, holding the ground under re-loca-



THE EUROPEAN CARP—Ciprinus Carpio.



PLAN OF GOVERNMENT CARP POND, WASHINGTON, D. C.

The European Carp.

Recently we promised our readers plans and descriptions for making carp ponds. As an introduction to this practical information, which we hope soon to present, we give in this issue a picture of the true European carp *(Ciprinus carpio)* and a view of the Government carp ponds at Washington. For these engravings we are indebted to the *Semi-Tropic California*.

About the time that carp were brought to this State by the enterprise of Mr. Poppe, of Sonoma, there was also inaugurated a movement on the part of the United States to secure the fish for general distribution throughout the country. In 1876, Prof. Baird, United States Commissioner of Fisheries, having for a long time understood the importance of acclimating the carp in this country, engaged an eminent German fish-culturist, Dr. Rudolph Hessel, to bring over a supply of the best varieties of this favorite European food-fish. The first experiment, in May, 1876, was unsuccessful, and out of 300, with which he started, only four survived. In May, 1877, Dr. Hessel returned from a third trip, bringing to New York 345 young carp, 227 of which were of the varieties known as the "leather carp" and "mirror carp," and 118 of the common or "scale carp." They throve and increased rapidly in size, and in May, 1878, 120 were removed to the Government carp ponds, built for them on the Washington Monument Reservation, in the city of Washington. These ponds, a plan of the essential portions of which is given below, are constructed after the best German models, and cover about twelve acres of land, in the vicinity of the Washington Monument. The letters upon the engraving are interpreted as follows: *A, B, C, D, E* and *F*, hatching ponds; *G*, turtle pond; *H*, watch house; *J*, cast pond; *K*, northwest pond; *L*, southwest pond; *O, O*, outlets; *P, P*, fountains.

The carp have now multiplied to such an extent in the Government ponds that it is possible to begin the work of distributing them. The introduction of this new food-fish will be of great interest and importance to all inland communities; for there is no ditch, pond, or mill dam, or any boggy, muddy spot, which can be converted into a pond, in which they will not thrive. It will be strange if, within twenty years, carp do not become as common domestic animals as ducks or pigeons.

The carp belongs to the family known to naturalists as the *Cyprinidæ*, members of which are to be found in every stream and pond in North America. Good examples of this family are the common goldfish, and the familiar brook species known everywhere by such names as "dace," "chub," "red-fin," "fall-fish" and "shiner." The "Buffalo-fish" of the West is also said to resemble it in many respects. The carp, however, is the king of his tribe, and those who know, do not hesitate to say that, as a food-fish, it far excels the best of them.

The carp has other and strong recommendations: It is, of all fish, the most readily propagated and reared. It has been domesticated in Europe from time immemorial, having been introduced many centuries ago from Central Asia or China, where it is native. Carp soon become tame and eat from the hands of their keeper. Dr. Hessel handles those in the Government ponds as if they were tame kittens, and says that they come to him when he whistles. Their fecundity is great. A fish weighing four or five pounds lays 400,000 to 500,000 or more eggs, and one of ten or fifteen pounds about 1,500,000. In Middle Europe they spawn from May to August, and the breeding season appears to be nearly the same in Washington. In 1879 they spawned here from June to September. The eggs are sticky, and cling to plants and twigs, hatching in from nine to eighteen days, according to temperature. The actual rate of increase is very great, owing in part to the fact that the parents do not devour their young. The one hundred and twenty fish brought to Washington two years ago have increased to, at least, twenty thousand. It is thus able to populate a body of water to the fullest extent. Unlike the majority of American food-fishes, their diet is largely vegetable, and they are particularly fond of water-cresses and other juicy plants. They also devour worms and insect larvæ, which they root out of the mud, and all kinds of refuse matter, such as the offal of kitchens, slaughter-houses and breweries. By reason of these habits, they are harmless to other fishes inhabiting the same waters.

The carp is adapted to very varied climates, and will thrive under conditions unfavorable to any equally palatable American fish. It is very hardy in all stages of growth.

When we take up the subject of constructing carp ponds, which may be in our next issue, we shall speak of the situations and conditions favoring the growth of the fish.

THE Clayton steam pump and air compressor works of Brooklyn, N. Y., have within the past six months enlarged their shop, increasing its capacity some 50%, and for some time past has been obliged to employ another shop exclusively on air compressors for mining purposes.

FOUR HUNDRED human beings have been offered up in Mandalay as sacrifices.

AN earthquake occurred at San Buenaventura Sunday morning. It was felt also at Riverside and San Bernardino.

Price of Water for Irrigation.

Complying with the provisions of the new Constitution, and before legislative action was taken to enforce its provisions, Supervisors in one or two counties met in February to fix the rates for water sold by water companies for irrigation and other purposes. In a number of towns similar action was taken. The matter has just been given definite shape by a law prescribing that this year the water rates must be established at the first session of the Supervisors after its passage; in future years the action must be taken during February in each year. The following is the new law:

An act authorizing the Board of Supervisors of the counties in which water is sold for the purpose of irrigation, to fix the rate at which water is sold, approved Mar. 26, 1880.

SECTION 1. The Board of Supervisors of the several counties of this State in which water is appropriated, furnished and sold principally for the purpose of irrigation, are hereby authorized and required to fix the maximum rates at which such water shall be furnished and sold, at a meeting, to be held in the month of February of each year; provided, that in the year 1880 such rates shall be fixed at the first meeting after the passage of this act. The rates so fixed and established shall be in force from and after the first day of July, after the date of fixing said rates, and shall continue in force for the period of one year; provided, that nothing in this section shall apply to water furnished within the limits of any incorporated city and county, city or town.

SEC. 2. Any person, company or corporation collecting rates for water furnished for irrigation in any county in this State in excess of the rates as provided in Section 1 of this act, shall forfeit for the public use the franchise and water works of such person, company or corporation to the county in which such excessive rates were charged.

SEC. 3. Upon affidavit being made by any interested party, setting forth that any such company, person or corporation has charged rates for water furnished for irrigating purposes in excess of the rates established by the Board of Supervisors, the said Board of Supervisors shall cause the District Attorney to commence an action in the Superior Court of the county, within 30 days from the receipt by them of the affidavit, to enforce the forfeiture of the franchise and water works of such person, company or corporation.

SEC. 4. If the Board of Supervisors fail or neglect to fix the rates, as provided in Section 1 of this act, or if the Board of Supervisors fail or neglect to commence the action provided for in Section 3 of this act, as therein provided, any interested person may commence proceedings to compel the performance of such duties.

SEC. 5. No person, company or corporation selling water for irrigation shall be permitted to exercise any control as to the use of the water after its delivery to the purchaser.

SEC. 6. This act shall take effect immediately.

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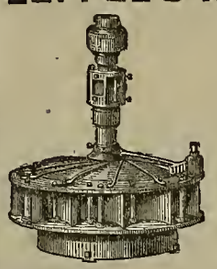
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In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

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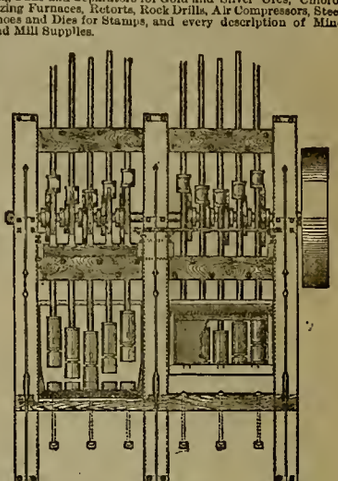

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Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

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CONTINUED FROM PAGE 245.

site side, and it is a thicker layer. The granulated carbonate, the kind you can shovel out, has been found in the latter named discovery, in small quantities, however; but where there are small pockets it is believed larger ones also exist.

HIGH.—The High Lode, Col. Elliott's mine, is keeping up its lick. An 11-day run of Elliott's 30-stamp mill on ore from the High Lode, produced a $10,000-retort, which was on exhibition at the Merchants' National bank yesterday.

CALEDONIA.—The Caledonia 60-stamp mill will start up to-day. It is thought that hereafter the stock owners in this company will receive dividends instead of paying assessments.

SPEARFISH DITCH.—The work is now being pushed as rapidly as possible; over 30 men have been constantly employed all winter putting together the flume, and by the 25th of this month, 5 miles of the flume will he completed, and, in a great portion of this distance, 10 inches in depth of water has been running all winter, and has never frozen up as yet. There has been a great deal more work done on this side of the Spearfish than has been done on the other, in the way of grading and tunneling, and on the 1st of May the management propose to put a large force of men at work on all that portion that has not been prepared for the flume. The first 10 miles of the ditch is through a limestone formation, and in this portion the flume will be uncovered, and from the experience of the past winter it is safe to presume that the water will not freeze. The remaining portion of the distance runs through a slate formation and in this part the flume will be covered. This ditch takes the water from the north fork of Spearfish, and in its course crosses several smaller streams, all of which afford water that will make at the lowest stage all that the flume can carry, and the flume is 30 inches square. This ditch, when completed, will add more to the permanent wealth of the county than would the erection of a 500-stamp mill.

MONTANA.

GAYNON.—Butte *Miner*, Mar. 23: The shaft has a depth of 245 ft. It is being sunk on the hanging wall. On the 225 level the crosscut from the shaft is still being pushed forward. The west level is in 40 ft from a point in the crosscut 25 ft from the shaft. This level is on the hanging wall, from which crosscuts will be run for taking out ore. The ore at present taken from the upper levels is of very high grade, and, besides the silver, carries from 15% to 20% copper.

ANGLO-SAXON.—The incline shaft has a depth of 100 ft. A level has been run east 65 ft and west 00 ft. In the east level a 6-ft vein of base ore is being extracted; in the west the vein is reduced in size, but the ore is of improved quality.

MOOSE.—The ledge continues strong and well defined, and in the face of the north level a 2-ft vein of magnificent looking base ore is being extracted, assaying upwards of $200 per ton. Midway between the face of the level and the shaft an upraise has been started, showing up a 4-ft vein of excellent ore. From the bottom of the 80-ft shaft, a crosscut was run west, which, at a distance of a few feet, uncovered a well-defined vein of ore of much richness. A level has been run on the vein, 35 ft in length. The ore is of 2 kinds, some being free and some base. The streak of the former is 18 inches wide, and assays 92 ounces in silver per ton. The base ore is much richer. The streak will average 2½ ft in width, and assays 282 ounces.

GRAY ROCK.—The west level, 70 ft from the surface, is in 180 ft. It is impossible to estimate the amount of ore in sight, as no crosscut has been run; but a breast of base ore, assaying $40 per ton, has been extracted from one end of the level to the other, and not a pound of waste is visible in its entire length. It is undoubtedly one of the largest ore bodies in the district.

SUNNY SIDE.—The vein runs vertically into the hill, and is penetrated by a shaft 70 ft deep. From a point 30 ft below the surface, a level was run 80 ft west, from which 200 tons of free milling ore of fair grade have been extracted, leaving a considerable body yet in sight. The second level running west from the bottom of the shaft is in 50 ft, showing an improved quality of ore carrying a light percentage of copper. Two assays of ore from this level show 78 and 156 ounces in silver.

HORSE PLAINS MINES.—Helena *Independent*, April 10: The latest mining excitement is in the direction of Horse plains, at a point near the head of Thompson river, and about 100 miles from Missoula. The camp is called Maginnis gulch. A large number of claims have been staked, but no work can be done yet on account of the snow which is several ft deep. Fair prospects have been obtained, and it is believed that gold in paying quantities will be found in that vicinity the coming summer.

YOGO.—There are many conflicting reports concerning the extent and richness of the Yogo mines. The reports lately received and particularly those which seem to be the most trustworthy, are not such as to justify the high expectations that were first had with reference to them. Certainly nothing has thus far been discovered, of such value as to cause anything in the nature of a stampede. The indications at present are that a few of the claims may pay reasonably well when bedrock shall be reached, and some of the claims may prove to be very rich. But reaching bedrock seems to he a difficult and expensive matter, so that only men of means can, in the present condition of the camp, afford to make the experiment.

OREGON.

MINING ITEMS.—*Oregon Sentinel*, April 7: Miners on Foots creek are all busy yet, with every indication of a good clean-up. Kahler, McDonough & Co. have resumed ground sluicing in the Fort Lane diggings. T. L. Beck, of Willow springs, is again ground sluicing. The Squaw Lake Co. are moving much dirt that prospects fairly and have plenty of water. Sam Lackland, of the Palmer Creek mine, is piping night and day, gravel looking well and water flush. The Applegate Gravel Co. are preparing to start in on a new and more favorable location, where they will have more dump. Barkdale & Kline, in the Blackwell district, are yet unable to sink on their rich quartz pocket, but are doing well sluicing the ground adjacent to it. Capt. Ankeny has returned from Calice creek and says both the English and Blue Gravel companies are enjoying full ditches of water, with a prospect of a long washing season. The Sterling Co. are just about ready to begin washing in their rich ground, and are now running their two pipes and a full supply of water. The heavy snow banks at the source of supply, will enable this company to work all summer. Brad. Dean, of Willow springs, was in town on Saturday with a nice lot of gold dust. He reports the most of the miners as having resumed ground sluicing, the water supply being flushed by the late heavy rain. Supt. Benner of the Centennial, was still piping night and day in good ground. Ralls has a full head of water on the richest ground in the camp, and is said to be making an ounce per day to the hand. From David L. Hopkins, who has just returned from Josephine county, we learn that the miners of that section have plenty of water and a good prospect for the supply continuing for some time. Wimer & Co. are making the dirt fly at their mines with excellent prospects. The Brown Bros. have changed the location of their hydraulic, and are now piping in a streak of gravel that prospects well. Mr. Hopkins thinks the mines in that locality will make a better showing this year than for some time past.

UTAH.

TIWAUKEE.—Salt Lake *Tribune*, Mar. 31: The lower tunnel cuts the ledge at 100 ft. From this point 2 drifts have been run at right angles on the vein for 75 ft, each from the tunnel east and west, thus opening the vein in length 150 ft, the greater part of which is in ore of a very fine quality. In the west drift a winze has been sunk 65 ft, showing ore the entire distance. The vein is 25 ft in width, but not all ore. From the tunnel a raise has been run 55 ft. Two crosscuts have been run on the vein from this raise, one 50 ft east, the other 35 ft west, showing ore the whole distance. Another raise is being run from the east drift on the lower level to connect with the upper crosscut and the upper workings of the mine. The ore is carefully sorted, both in the mine and ore house, and is divided into 4 classes. The 1st class sells for $125, the 2d for $100, the 3d for $60 and the 4th, which is screenings, for $30 per ton. With the present working force, the Tiwaukee can easily produce 100 tons of first-class ore monthly.

MAXWELL.—This mine is near Argenta, Big Cottonwood canyon, and is looking extremely well, having exposed a rich vein fully 3 ft thick within the last few days. The ore is a carbonate, heavy in lead and rich in silver.

DIAL.—Judge Kinney has made a good strike in this mine. The vein has widened out, showing a promising body of fine carbonate ore.

Protection of Mining Stockholders.

Fellows' Assembly bill, entitled an act for the further protection of stockholders in mining companies, has finally passed the Senate by a vote of 31 to 4, and has gone to the Governor for signature. The provisions of the bill are as follows:

SECTION 1. It shall not be lawful for the Directors of any mining corporation to sell, lease, mortgage, or otherwise dispose of the whole or any part of the mining ground owned or held by such corporation, nor to purchase or obtain, in any way, any additional mining ground, unless such act be ratified by the holders of at least two-thirds of the capital stock of such corporation. Such ratification may he made either in writing, signed and acknowledged by such stockholders, or hy resolution, duly passed at a stockholders' meeting called for that purpose.

SEC. 2. All stock in each and every mining corporation in this State shall stand in the books of said company, in all cases, in the names of the real owners of such stock, or in the name of tbe trustees of such real owners; but in every case where such stock shall stand in the name of a trustee, the party for whom he holds such stock in trust shall be designated upon said books, and also in the body of tho certificate of such stock.

SEC. 3. It shall not be lawful for any [such] corporation, or the Secretary thereof, to close the books of said corporation more than [three] days prior to the day of any election. At such election the stock of said corporation shall be voted by the bona fide owners thereof, as shown by the books of said corporation, unless the certificates of stock dnly indorsed, be produced at such election, in which case said certificates shall be deemed the highest evidence of ownership [and the holder thereof shall be entitled to vote the same].

SEC. 4. All acts and parts of acts in conflict with this act are herehy repealed.

SEC. 5. This act shall take effect from and after its passage.

The Hoover Telephone.

We have our editorial and composing rooms connected with a Hoover Telephone, and its workings give good satisfaction. It is not an electric telephone, but a simple arrangement of metallic diaphragms and an intensifying drum, and is called a mechanical telephone, in distiuction from the more complicated electric apparatuses. We can readily believe that the Hoover design is much better than others of its class, for we have tried some others and found them unsatisfactory, while the Hoover is a great convenience. The telephone is wholly of metals, and is quite ornamental in its appearance. It transmits the voice so perfectly as to preserve its individuality and enable its posaessor to be recognized. By the use of a double metallic diaphragm, in proper relation to a dead air chamber and conceutrating tube, the full volume of the voice is coucentrated within and upon the diaphragm, and, with the speed of electrical action, it is transmitted and reproduced upon the receiving diaphragm, and by it given off again to the ear of the listener at a distance of several feet from the instrument. A conical metal tube, which is surrounded hy a dead air chamber, conducts the sound to the vibrating diaphragm, from which its deflection is prevented hy an upper and concave diaphragm which forms the base of the dead air chamber. This gives much louder and clearer vibrations than are given by mouth-pieces made of wood or other solid substances.

For connecting office with factory, factory with salesroom, office with private residence, doctor's office with drng store, one store with another, upper floor with lower floor, a friend's house with another, and many hundred different uses, wbere the distance does not exceed one mile, we believe the Hoover telenhone will give good satisfaction. It is cheap, heing sent by express C. O. D. for $10 per pair, complete, with directions for setting up. The wire will be furnished for 5 cents per rod, if desired. The instruments are sold iu this city by the Hoover Telephone Company, room 24, 328 Montgomery street, to whom all communications may be addressed.

AT Matteson, Ill., a physician has been inoculating people with virus from a small-pox patient, in order to increase his practice.

THE Governor has offered a reward of $500 for the arrest of the murderers of C. P. Severance, killed in Marin conuty, last week.

News in Brief.

THE Indian war at Wrangel ia over.

CALLAO, Peru, is to he blockaded or bombarded.

GRANT will be at Cairo, Ill., on the 15th or 16th inst.

THE strike of coal miners at Nanaimo, B. C., has ended.

A CONSIDERABLE number of small-pox cases exist in Chicago.

BRET HARTE has been appointed to the Consulate at Glasgow.

THE strength of the permanent army in Cuba is fixed at 40,000 men.

LORD LYTTON, Viceroy of India, has been created Earl of Lytton.

WM. H. VANDERBILT has $51,000,000 invested in U. S. 4% bonds.

A GENERAL advance of British troops has taken place in Afghanistan.

THE Irish organization at London will give a public reception to Parnell.

HON. E. GARTER, a pioneer of Shasta, died at that place a few days since.

PRINCE GORTSCHAKOFF, the Russian Chancelor, is in a dying condition.

GOVERNOR HOWARD, of Dakota, died Saturday last at Washington, Mich.

THE Indians in British Columbia are bscoming menacing in their attitude.

A MALIGNANT case of small-pox has been discovered at East Portland, Oregon.

THE strike among the fishermen on the lower Columbia river in Oregon continues.

AT a ball in Callaway county, Mo., Lewis H. Meyers was killed by Mark Walton.

THE Postmaster-General recommends a new postoffice building for San Francisco.

A TOWBOAT and barge left St. Louis a few days since with 400,000 bushels of corn.

THE American Mining Exchange has been organized at New York with 122 members.

IT is said that oleomargarine has a sale in this country of 98,000,000 pounds per annum.

SILVER in Londou 52d; consols, 93 11-16; 5% United States bonds, 105⅝; 4s, 109½; 4½s, 111½.

PARNELL has received the freedom of the city of Cork for his services in behalf of Ireland.

THE resignation of Lord Lytton as Viceroy of India has been received at the India office in London.

SENTENCE of death has been pronounced at Ukiah on George Gaunce, one of the Mendocino outlaws.

A FAMILY of a mother and five children were poisoned at Belleville, Ontario, recently by eating wild parsuips.

IN a recent battle between the Chileans and Peruvians, the former lost all but 67 men out of a regiment of 1,200.

A HEAVY column of black smoke is issuing from one of the points of Mount Baker, in Washington Territory.

IN New York Government bonds are quoted at 107½ for 4s of 1907; 103½ for 5s of 1881; 109 for 4½s; sterling, $4.86@$4.89; silver bars, 113⅞; silver coin, ¼ discount huying, par selling.

The Californian.

The May number of this new magazine has just been issued. Two new departments have been added, and the index shows the contents to he varied and interesting. The magazine is aiming at a high standard, and endeavors each month to improve on the preceding numbers. We doubt not that the people of California will give that material support which is necessary to the maintenance of this monthly. It is projected on a high plane, and has met with warm encouragement. The contents of the May number are as follows:

Field Sports in Australia.....R. E. Desmond.
The First Legislature on this Continent..W. W. Crane, Jr.
In Shasta.....Charles H. Shinn.
Sand, Chapter V.....J. W. Cally.
The Present Crisis in San Francisco.....C. T. Hopkins.
The Philippine Islands.....Arthur T. Marvin
High Jinks.....Andrew McF. Davis.
Reminiscences of Col. E. D. Baker....Edward B. Jerome.
For the Last Time.....May N. Hawley.
Almost a Novel.....Philip Shirley.
A Day at an Old Mission.....Mary H. Field.
Ruby, Chapters III and IV.....Julia H. S. Bugeia.
The North Wind.....E. R. Sill.
The First Xerxes Loan Collection.....Octave Thanet.
Fish in Season.....W. N. Lockington.
Indian Dances in Northern California.....Lucy Sargent.

Note Book—"A Suggestive Picture," "The Aristocratic Impulse," "Intellectual Superiority as a Restraint," "California Prejudice and the Chinese Question," "Election-Mad," "Mr. Hopkins' Article, and a Word Concerning Contributions."

Science and Industry—"Transmitting Colors by Telegraph," "Harnessing Electricity," "Melting Steel by Friction," "Strength of Mind and Body," "Deadening Noises in Workshops," "Making Crape-sugar in the Kitchen," "Instability of High Factory Buildings," "A New Metallic Compound," "Insanity the Measure of Civilization," "Diogenes's Tub," "Revival after Freezing," "High-Power Microscopes."

Outcroppings—"An Incident," "The Woods of Chapultepec," "Rain-drops," "A Reminiscence of Von Weber," "A Young Widow's Reverie," "How I Lost Rosanna," "Discovery of the Bay of San Francisco," "Discontent," "Glimpses of a Story," "Twilight," "The Judge's Story," "At the Last," "The Novel," "My Cigarette." "Broken Cistern," "Booke Received," "Poem by Joaquin Miller Next Month," "Announcement."

CHANGING LIGHT-HOUSE OIL.—The steamer *Manzanita* which is the tender of the light-houses of the San Francisco district, has just returned to this port from her last trip to the light-houses of the district, and reports the substitution in the Humboldt, Trinidad, Crescent City, Yerba Buena, and the East Brothers' light-houses of kerosene oil for lard oil. This substitution is made by requirement of the Light-house Board of the United States.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING APRIL 0, 1880.

226,321.—CULTIVATOR—D. M. Johnston, Red Bluff, Cal
226,333.—STOCK CAR—W. Martin, S. F.
226,241.—HARNESS—P. S. Miller, S. F.
220,333.—WATER-CLOSET—G. Milne & W. H. Cants, S. F.
226,245 —BEER FAUCET—C. C. Redmond and A. W. White, San Jose, Cal.
220,357.—WINDMILL—G. Saccone, Sacramento, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

AT Cassiar, British Columbia, during the recent cold spell, quicksilver balls were fired with muskets through inch boards. Both there and at Glenora the thermometer was standing at 48° below zero. Nitric acid and whisky froze solid. Case brandy froze solid enough in 20 minutes to roll up in lumps like marbles. During the intense cold breathing was very oppressive.

WORK on the turquoise mine of New Mexico is being pushed. Tunnels are being run from each side of this mountain which will intersect and completely cut the mountain. Many fine specimens of turquoise have been found of good color and size. Ancient pottery is still found in large quantities, and quite a number of fragments of human skulls have been unearthed.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

CANDELARIA CON. M. CO.—Mar. 20th. Location: Esmeralda county, Nevada. Capital, $10,000,000. Directors—Simon Reinhart, H. M. Levy, R. P. Keating, T. M. Luce and P. J. White.

COLUMBUS CON. M. CO.—Mar. 20th. Location: Esmeralda county, Nevada. Capital, $10,000,000. Directors—Simon Reinhart, H. M. Levy, R. P. Keating, T. M. Luce and P. J. White.

GREEN MOUNTAIN M. & M. CO.—Mar. 29th. Capital, $10,000,000. Directors—J. D. Power, W. H. H. Hart, Clinton Curtnese, J. L. Browne and George S. Currier.

RED JACKET G. & S. M. CO.—Mar. 20th. Capital, $1,000,000. Directors—L. M. Tosh, P. G. Wibbard, C. H. Wakelee, G. W. Spencer and S. C. Curtis.

VALLECITO HYDRAULIC M. CO.—April 5th. Location: Calaveras county, Cal. Capital, $1,000,000. Directors—A. J. Bryant, E. B. Pond, Wm. Dunphy, C. H. Livingston and A. M. Mitchell.

MARIPOSA G. & S. M. CO.—Mar. 30th. Location: Mariposa county, Cal. Capital, $2,500,000. Directors—H. H. White, J. F. Brown, W. E. Brown, J. W. Snyder and E. S. Utter.

METALS.

[WHOLESALE.]
WEDNESDAY M., April 14, 1880.

IRON.—	
American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	—@35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 5¾
Horse Shoea, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 16
Plow Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 33
Sheathing, Tinned 14x48	— @ 42
Nails	— @— —
Bolts	33 @— 42
Old	— @— 18
Brazier's, in all sizes	33 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	6 @— 6½
Bar	— @— 6½
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck, " "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.—	
10x14 I C Charcoal	— @10 50
10x14 I C Coke	10 00 @10 00
Banca Tin	— @25 00
Australian	— @20 00
I. C. Charcoal, Roofing 14x20	— @10 00
" " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	10a@— 11
NAILS.—	
Assorted sizes	6 50@6 75

LUMBER.

WEDNESDAY M., April 14, 1880.

CARGO PRICES OF REDWOOD.		REDWOOD. RETAIL PRICE.	
Rough, M	14 00	Rough, M	18 00
Surface	24 00	Pickets, Rough	15 00
Rustic	24 00	Pointed	16 00
do, No. 2	18 00	Fancy	22 50
Flooring	24 00	Siding	20 50
do, No. 2	17 00	Surfaced & Long Beaded	30 00
Beaded Flooring	28 00	Flooring	25 00
Refuse	20 00	do, No. 2	17 00
Half-inch Siding	20 00	Rustic, No. 1	25 00
Refuse	16 00	do, No. 2	18 00
Half-inch Surfaced	24 00	Battens, lineal ft	—
Refuse	18 00	Shingles M	2 00
Half-inch Battens	16 00	**PUGET SOUND PINE** RETAIL PRICE.	
Pickets, Rough	11 00	Rough, M	18 00
Rough, Pointed	12 50	Fencing	18 00
Fancy, Pointed	18 00	Laths	3 50
Shingles	1 75		

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]
SAN FRANCISCO, April 14, 3 P. M.

SILVER, ¼.
GOLD BARS, 890@910. SILVER BARS, 10@18 ₱ cent. Discount.
EXCHANGE on New York, 25, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 90@92.
LONDON Consols, 98 1-18; Bonds (4%), 111¼
QUICKSILVER in S. F., by the flask, ₱ lb, 42½@45c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending April 13, 1880.

HIGHEST AND LOWEST BAROMETER.						
Apr. 7	Apr. 8	Apr. 9	Apr 10	Apr. 11	Apr. 12	Apr. 13
30.274	30.152	30.174	30.234	30.234	30.143	30.172
30.126	30.082	30.019	30.174	30.136	30.010	30.032
MAXIMUM AND MINIMUM THERMOMETER.						
60	09	63	57	60	60	54
47	50	50	43	43	49	45
MEAN DAILY HUMIDITY.						
82.3	83.7	89	74	75.7	75.3	67.7
PREVAILING WIND.						
W	NW	SW	W	SE	SW	W
WIND—MILES TRAVELED.						
191	139	132	162	158	204	241
STATE OF WEATHER.						
Fair.	Fair.	Cloudy	Clear.	Fair.	Fair.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.						
		.77			.11	.07

Total rain during the season, from July 1, 1879, 19.29 in.

Quinine and Arsenic

Form the basis of many of the Ague Remedies in the market, and are the last resort of physicians and people who know no better medicine to employ for this distressing complaint. The effects of either of these drugs are destructive to the system, producing headache, intestinal disorders, vertigo, dizziness, ringing in the ears, and depression of the constitutional health. AYER'S AGUE CURE is a vegetable discovery, containing neither quinine, arsenic, nor any deleterious ingredient, and is an infallible and rapid cure for every form of Fever and Ague. Its effects are permanent and certain, and no injury can result from its use. Besides being a positive cure for Fever and Ague in all its forms, it is also a superior remedy for Liver Complaints. It is an excellent tonic and preventive, as well as cure, of all complaints peculiar to malarious, marshy and miasmatic districts. By direct action on the liver and biliary apparatus, it stimulates the system to a vigorous, healthy condition.

FOR SALE BY ALL DEALERS.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appear from time to time in this paper.

THE BEST NEWSPAPER FILEHOLDER AND ADJUSTABLE BINDER can now be had at this office. It consists of elastic fastenings, with stiff, cloth covered side. Size suitable for a full volume of this paper, $1. To our subscribers, 75 cts., mailed postpaid.

THE SCIENCE RECORD for six months and our cloth covered newspaper fileholder and binder, for one dollar.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco.

Mining and Other Companies.

Pereons intereeted in incorporated eharee will do well to recommend the publication of the official noticee of their companies in thie paper, as the cheapeet appropriate medium for the eame.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, 420 Montgomery St., San Francisco, Cal.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 29th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 41), levied on the Eighth day of March, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. Shares.	Amt.
Ashby, Mark T, Trustee	8	800	$80 00
Ashby, Mark T, Trustee	9	500	50 00
Ashby, Mark T, Trustee	10	405	40 50
Ashby, Mark T, Trustee	11	1000	100 00
Ashby, Mark T, Trustee	12	100	10 00
Ashby, Mark T, Trustee	13	200	20 00
Ashby, Mark T, Trustee	14	100	10 00
Ashby, Mark T, Trustee	15	100	10 00
Ashby, Mark T, Trustee	17	400	40 00
Ashby, Mark T, Trustee	18	100	10 00
Ashby, Mark T, Trustee	20	250	25 00
Ashby, Mark T, Trustee	21	50	5 00
Adams, Catherine S....	168	25	2 50
Adams, Catherine S....	169	25	2 00
Brayton, M L.....	246	2000	2 00
Brayton, M L.....	247	575	57 50
Cardwell, S A.....	292	100	10 00
Foy, C W.....	293	250	25 00
Glavich, M.....	45	30	3 00
Glavich, M.....	46	30	3 00
Goodrich, S S.....	142	50	5 00
Goodrich, S S	143	50	5 00
Goodrich, S S	144	50	5 00
Goodrich, S S	145	50	5 00
Goodrich, S S.....	146	50	5 00
Goodrich, George B....	170	50	5 00
Goodrich, Geo B.....	180	50	5 00
Goodrich, Geo B.....	181	50	5 00
Goodrich, Geo B.	182	50	5 00
Goodrich, Geo B.....	183	50	5 00
Grant, R H.....	290	50	5 00
Harris, James.....	56	50	5 00
Harris, James.....	57	50	5 00
Harris, James.....	58	50	5 00
Holmes, George M....	118	40	4 00
James, James.....	65	63	6 30
Jordan, Geo E.....	175	100	10 00
Jordan, Geo E.....	176	150	15 00
Lonman, Hosea H.....	184	50	5 00
Lonman, Hosea H.....	185	50	5 00
Lonman, Hosea H.....	186	50	5 00
Lonman, Hosea H.....	187	50	5 00
Lonman, Hosea H.....	188	50	5 00
Maxcy, S N.....	104	500	50 00
Maxcy, S N.....	105	500	50 00
Maxcy, S N.....	106	100	10 00
Maxcy, S N.....	107	100	10 00
Maxcy, S N.....	108	200	20 00
Maxcy, S N.....	109	250	25 00
Mead, L G.....	216	1575	157 50
Palmer, Wales L, Trus.	80	1000	100 00
Palmer, Wales L, Trus.	81	500	50 00
Palmer, Wales L, Trus.	82	500	50 00
Palmer, Wales L, Trus.	83	250	25 00
Palmer, Wales L, Trus.	265	2000	200 00
Smitherum, Samuel...	221	75	7 50
Swett, E C.....	274	125	12 50
Venning, John.....	63	100	10 00
Venning, John	64	150	15 00

Also, 400 shares of the old issue, equal to 2300 shares of the new issue of the capital stock of the said Gover Mining and Milling Company.

Name	No. of Certificate.	No. of Old Shares.	No. of New Shares.	Amt
Goding, E L.....	115	50	250	25 00
Goding, E L.....	254	25	125	12 50
Goding, E L.....	741	13	65	6 50
Goding, E.....	143	50	250	25 00
Goding, Ephraim...	847	25	125	12 50
Goding, Ephraim....	730	20	100	10 00
Goding, Mrs E.....	740	12	60	6 00
Hildreth, Anna W..	647	25	125	12 50
Lennan, Lewellyn..	337	10	50	5 00
Lennan, Lewellyn..	517	10	50	5 00
Lennan, Lewellyn..	572	20	100	10 00
Lennan, Lewellyn..	679	10	50	5 00
Lennan, Lewellyn..	717	10	50	5 00
Lennan, Lewellyn..	718	10	50	5 00
Maxcy, Josiah.....	209	10	50	5 00
Maxcy, Josiah.....	590	100	500	50 00
Shaw, A W.....	882	5	25	2 50
Shaw, A W.....	485	5	25	2 50
Skinner, E C.....	620	50	250	25 00

And in accordance with law and an order of the Board of Directors made on the eighth day of March, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No 402 Front street, San Francisco, California, on Monday, the third day of May, 1880, at the hour of one o'clock P. M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale. W. O. WILSON, Secretary.

Office—No. 402 Front street, room 8, San Francisco, California.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) levied on the 14th day of January, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
J R Robbins, Trustee....	17	68	6 80
J R Robbins, Trustee....	61	1000	100 00
A Hinds.....	57	1000	100 00
J K Cooper, Trustee.....	106	100	10 00
T L Bibbins, Trustee....	00	100	10 00
T L Bibbins, Trustee....	100	100	10 00
T L Bibbins, Trustee....	103	50	5 00
T L Bibbins, Trustee....	130	1000	100 00
T L Bibbins, Trustee....	142	450	45 00
T L Bibbins, Trustee....	148	50	5 00
T L Bibbins, Trustee....	150	500	50 00
T L Bibbins, Trustee....	157	100	10 00
T L Bibbins, Trustee....	163	100	10 00
T L Bibbins, Trustee....	176	50	5 00
T L Bibbins, Trustee....	213	100	10 00
T L Bibbins, Trustee....	229	100	10 00
T L Bibbins, Trustee....	231	100	10 00
T L Bibbins, Trustee....	254	20	2 00
T L Bibbins, Trustee....	436	1000	100 00
M French, Trustee.....	346	1000	100 00
H R Taylor, Trustee.....	349	50	5 00
J Griswold, Trustee.....	441	6900	690 00
Unknown.....	251	65	6 50
Unknown.....	253	30	3 00
Unknown.....	250	42	4 20
W Townsend, Trustee....	410	1000	100 00
W Townsend, Trustee....	411	500	50 00
W Townsend, Trustee....	412	500	50 00
T A Wright, Trustee.....	309	1000	100 00
J R Robbins.....	257	20	2 00
G L Waters, Trustee.....	410	200	20 00
W J Gwynn.....	402	1000	100 00
M K Lauden, Trustee....	390	1000	100 00
M K Lauden, Trustee ..	391	1000	100 00
M K Lauden, Trustee....	392	1000	100 00
M K Lauden, Trustee....	393	1000	100 00
M K Lauden, Trustee....	394	1000	100 00
E A Richardson, Trustee.	315	500	50 00
E A Richardson, Trustee.	316	500	50 00
E A Richardson, Trustee.	317	500	50 00
E A Richardson, Trustee.	318	500	50 00
E A Richardson, Trustee.	319	500	50 00
E A Richardson, Trustee.	320	500	50 00
E A Riebardson, Trustee.	321	500	50 00
E A Richardson, Trustee.	322	500	50 00
E A Richardson, Trustee.	323	500	50 00
E A Richardson, Trustee.	324	500	50 00
E A Richardson, Trustee.	325	500	50 00
E A Richardson, Trustee.	326	500	50 00
E A Richardson, Trustee.	327	500	50 00
E A Richardson, Trustee.	328	500	50 00
E A Richardson, Trustee.	329	500	50 00
E A Richardson, Trustee.	330	500	50 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of January, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 314 Bush street, San Francisco, on Thursday, the 11th day of March, 1880, at the hour of 1 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

T. L. BIBBINS, Secretary.

Office—314 Bush street, San Francisco, California.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Thursday, the 25th day of March, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Rocky Point Mining Company is postponed to Tuesday, the 20th day of April, 1880, at 1 o'clock P. M.

T. L. BIBBINS, Secretary.

ANNUAL MEETING.

NOTICE.—The Annual Meeting of the stockholders of the BRILLIANT MINING COMPANY, for the election of officers to serve for the ensuing year and for the transaction of such other business as may properly come before it, will be held on Wednesday, the 21st day of April, 1880, (third Wednesday in April), at 2 o'clock P. M., at the office of the Company, room 4, 309 California Street, San Francisco, California.

J. M. BUFFINGTON, Secretary.

Office—Room 4, No. 309 California Street, San Francisco, California.

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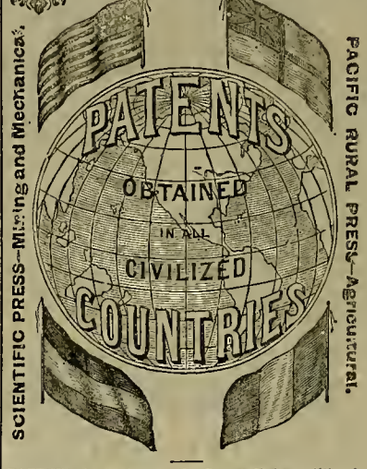

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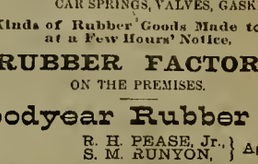

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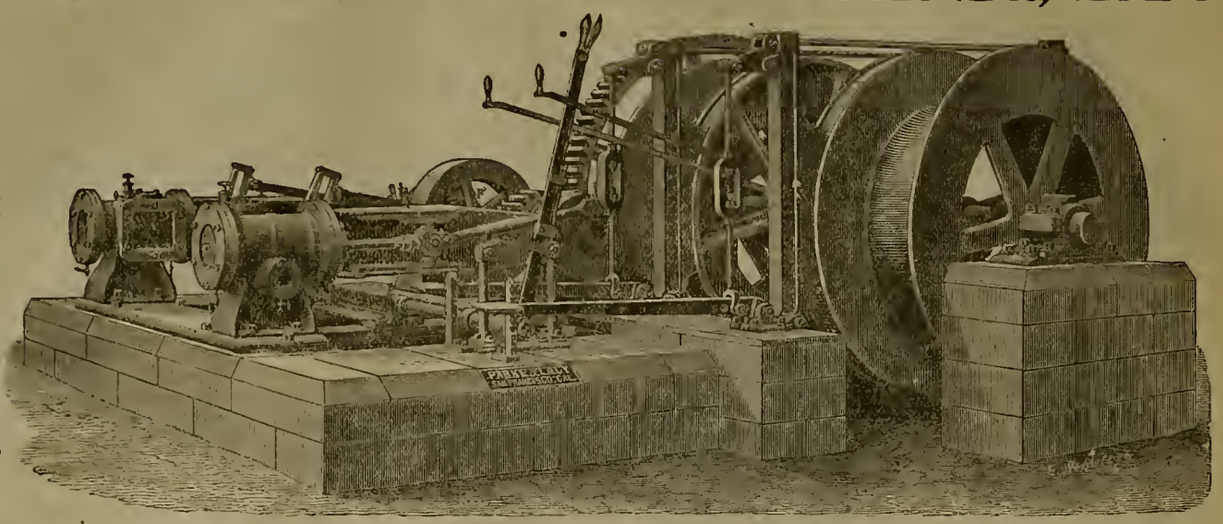

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Rotary Pulverizer,

(WHITE'S IMPROVED,)

For Disintegrating Ores and Other Substances.

GUARANTEED TO BE EQUAL IN CAPACITY TO A

HUNDRED STAMP BATTERY!

IS FITTED UP WITH

Homogeneous Steel Beater Bars.

Found to be more durable than either Hard Steel or Soft Iron. Dry-crushing the hardest rock; will last for months, and without the slightest danger of breakage.

The Pulverizer requires about one-third the power usually expended for the reduction of the same amount of Ore by Stamps.

Price List, Etc., of the White Rotary Pulverizer.

No.	Tons Per Hour.	Inches Diameter.	Revolutions Per Minute.	Horse Power Required.	Shipping Weight.	Lumber Required.	Price.
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3	16	84	400	75	20	12,000 "	10,000

The Repairs on the Pulverizer will not exceed those of a 10-Stamp Battery.

The Shipping Weight of the entire apparatus is not one-eighth of that of Stamp-Mortars required to do an equal amount of work. ☞It can be placed and put running at the Mill in from fifteen to twenty days.

Address GEO. W. WHITE, Inventor.

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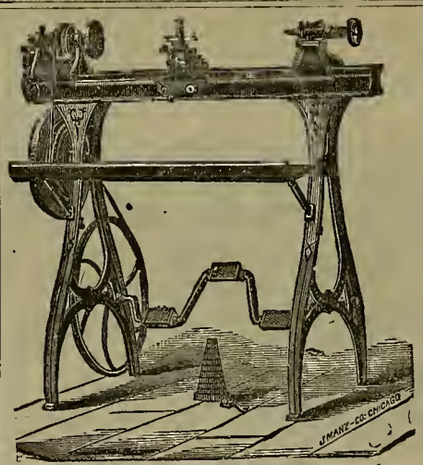
San Francisco, Cal., January 1st, 1880.



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THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand.

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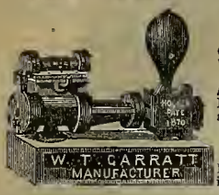

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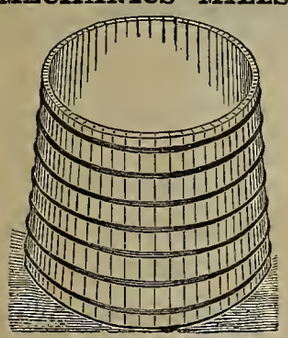

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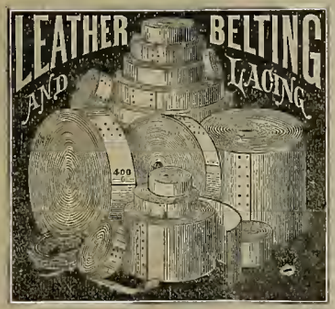

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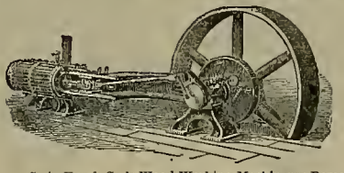

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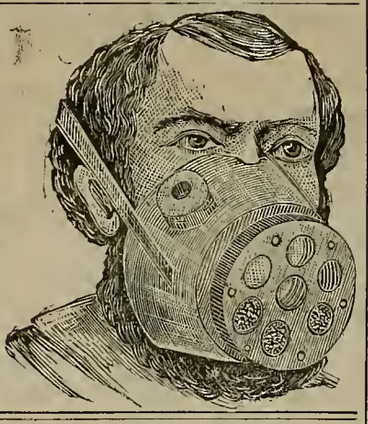

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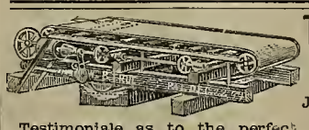

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Second—The Corliss cannot, without sacrificing some of this two-fifths and reducing its range of governing to a minimum, give any exhaust lead or cushion. The consequence of this is that Corliss Engines of almost every builder thump badly, and also need to be much larger than is absolutely required, so as to be ready for emergencies. It is plain that an engine that can give only two-fifths of a stroke cut-off is not to be relied on for sharp work under heavy change of load and must have a heavy fly-wheel to steady it.

We can give just what we need. Our New Automatic has trunk frame like the Corliss, but has rotary valves, both at bottom of the cylinder like the Wheelock. This is to save clearance. The valves are operated by cam motion, thus giving the most perfect opening and closing known. The valve opens full width and no further, and shuts just enough for safety. This saves wear and tear of reciprocating parts. Two eccentrics operate valve gear—one fixed, giving an invariable point of opening the steam and exhaust and closing the exhaust. The movable eccentric controlled by a rotary governor fixed on main shaft, where it can never get away, controls the closing, the valve being alternately controlled by the two eccentrics. No dash-pots nor noise, and the most exquisite adjustment.

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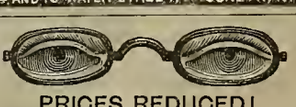

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 24, 1880.

VOLUME XL Number 17.

Copper Leaching.—No. 1.

[Written for the MINING AND SCIENTIFIC PRESS by C. H. AARON.]

There are many different processes of copper extraction by leaching, some of which are impracticable in this country at present, while others appear well adapted for the profitable treatment of our extensive mines of low-grade ore.

A fair, though slightly incorrect outline of one of these methods, was given in the PRESS of April 3d, but the selection of the best, under different circumstances, should always be the subject of careful calculation by a competent metallurgist, aided, if possible, by experiments on a small, but still a working scale, in which all conditions on which results depend, must be noted, with a view to their maintenance in the larger operations to follow, the neglect of which precaution is the only cause of the distrust in which small tests are held by many, a feeling which seems justified by numerous disappointments, which, however, need not have occurred.

In some cases very low-grade ore, chiefly the refuse which accumulates in great quantities from the mining and assorting of better qualities, may be profitably treated, as has been done at Copperopolis by the very simple process of causing small streams of water to flow upon and percolate the pile, whereby a weak solution of copper is obtained from the spontaneously decomposing sulphurets, and is either led directly through a series of vats or launders containing scrap iron, or is previously raised by wind or water power, and again passed through the ore pile as often as may be necessary to obtain a stronger solution of copper. The ground under the pile should be rock or clay to prevent loss of the liquor.

The copper obtained in this way is very impure, and the consumption of iron is greater than where a more rapid process is used, amounting to as much as three or even four parts of iron to one part of copper. Both these are ascribable, in great measure, to long exposure of the liquor to the action of air, and may be partly obviated by conducting the precipitation in covered boxes, through which, and over the slow stream of liquor, the fumes of burning sulphur are made to pass, or, by boiling the sufficiently enriched liquor in a vat by means of a jet of steam, with some raw sulphurets coarsely pulverized, and then transferring the clear solution, still hot, to other vats containing the scrap iron.

The extraction of copper from the ore is facilitated by using over again, for percolation, the decoppered liquor from the precipitation. Salt is also useful.

Solutions of copper, especially when hot and strong, cause wood to shrink, while moisture makes it swell. The result of these opposing tendencies on wooden vessels, when used for such solutions, depends on the condition and kind of the wood, whence they should be so constructed and arranged as to admit of tightening the hoops, bolts, or clamps by which their parts are held together as often as may be necessary. If oblong wooden tanks are used, the pieces forming the ends should have the grain in the same direction as that of the bottom planks, so that both may shrink or swell together and in similar proportion.

This process is adapted only to ore of very low grade containing some sulphurets and not much lime, or to the residues from other processes, as will appear hereafter. Ores which do not decompose somewhat readily under the influence of air and moisture, should first be burned in heaps, which method will be spoken further of in my next. In some cases it will be best to crush and concentrate, by which a richer material is got for treatment by better processes, while in others concentration is not practicable.

Where iron for precipitation is too dear or hard to get, limestone or lime may be used in its place, giving, not metallic copper, but a product which will be more or less rich according to the "skill and ability" displayed in the use of the lime. The crude soda of the marshes in the State of Nevada can be so applied as to give a very good quality of carbonate of copper, and even where iron is used, its consumption may be lessened and the copper improved by a judicious use of these substances.

The object of these articles is not so much to enable the reader to work copper ores as to direct the attention of the mining public to likely fields of profitable enterprise, by means of a general outline of those processes which seem best adapted to our country at present. Those who desire to study the subject more closely are referred to such works as those of Kerl, Phillips, Lamborn and others.

ARIZONA.—We intend soon to commence a series of articles upon Arizona, giving a succinct account of its geographical features, mining interests, agricultural districts, etc., and a sketch of its history before and since its acquisition by the United States. Since the completion of the railroad to Yuma, population has increased rapidly, and since its completion to Tucson, the capital, some fifty or sixty persons have arrived daily at that place. The mineral riches of the Territory will compare favorably with those of California, Utah, Colorado or Nevada, and the country, arid though much of it may appear, is more fertile than either of the three last-named Territories. Eastern and European capital is flowing in rapidly, and it is to give Californians a more complete knowledge of the great importance of the region that we publish these articles.

COAL is known to underlie fully 30,000 square miles of the Territory of Montana.

Wheelock's Improved Variable Cut-off Engine.

This is one of the latest inventions in cut-off engines. Although only introduced within the past few years, it has already taken high rank among all the engines of its class. The grand prize was awarded it at the Paris exposition two years ago in competition with all the best engines of the world. There is no part of the country where a close working economical engine is of so much importance as on this coast. Cut-off engines have been objected to by engineers on account of the complication of the valve arrangement, and a want has long been felt among engineers for a more simple and accessible first-class engine. This desideratum has been attained in a remarkable degree in the engine herewith shown, by the reducing of the number of parts, and placing all the mechanism for operating the valves on the outside of the steam chest, by which result every defect may be at once detected.

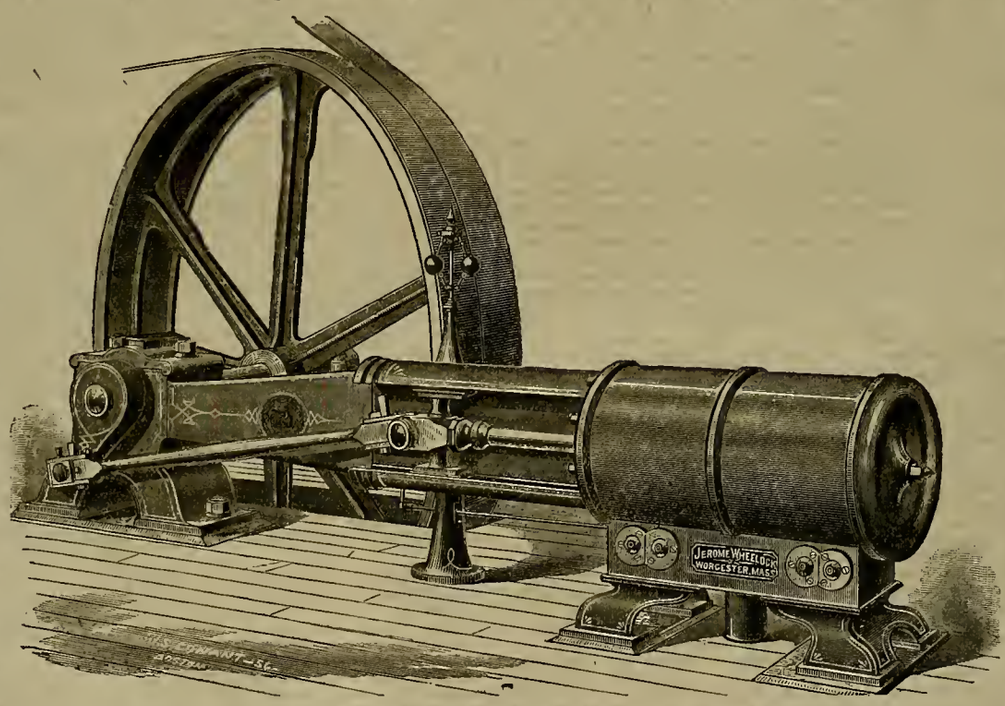

FIG. 1. THE WHEELOCK VARIABLE CUT-OFF ENGINE.

Valves are used which are suspended on hardened steel trunnions or stems and hardened steel bushings, and are located directly under the bore of the cylinder, at each end (reducing the clearance to the smallest possible amount.) The valves and seats are made tapering in their general diameter, and the pressure of steam comes on one side, also acting to keep the collar in contact with the sleeve. Steam is admitted and exhausted by a single valve, and any variation of the load is at once communicated through the action of the governor, which has control over two cut-off valves or wipers, by a simple mechanism, the construction of which is such as to insure uniformity of speed under extreme variations of load. By reference to sectional cut, on another page, it will be seen that a cavity in the cut-off valve allows of double admission and closing, which, when it is considered that the wiper is suspended on the hardened steel trunions and bushings, thereby maintaining the valve in a central position, that a most perfect result is obtained.

Attention is also called to the fact that the cut-off valve does not control the "lead" or time of admission to the cylinder, but is well open before the main valve is ready to open induction port. This is claimed as a great advantage, especially in cases where steam follows but a small portion of the stroke, inasmuch if cut-off opens but a "crack," as in cases where the lead is controlled by it, the mechanism is not sufficient to close it readily, and steam "sizzles" through the whole stroke, thereby making speed irregular.

The valve gear is constructed in the simplest form of the ordinary eccentric rod, and made to disengage at the pleasure of the engineer, by which result the engine can be worked by hand, either forward or backward, with perfect ease, a point very desirable in practice.

Motion is imparted to the valves by cranks keyed on to the hardened steel stems, which, being securely fastened to the valves, make any derangement inside impossible, while uniformity of wear is secured by the surfaces passing over each other at every revolution of the engine. By reference to the cut showing valve gearing, it will be noticed that the cut-off is worked from the main valve crank; the pin being an eccentric bolt, makes adjustment very handy; also that this attachment produces the celebrated wrist plate motion without its complications.

The entire adjustability of the valves to their seats is secured by a peculiar arrangement of the steel bushings (which can be driven in or out as required), the inner end forming a joint against a shoulder on the steel valve stem or trunion, obviating the necessity of any stuffing box. These steel stems have been found in practice to wear endways in about equal ratio with the surfaces of the valves and their seats, and, the valves being suspended, "with the surfaces but a contact" and pressure inclining the valves to their seats, great durability and ease of action is obtained.

The steam chest being located underneath, and forming a part of the cylinder, serves as a reservoir for water, thus guarding against all danger of injury to the cylinder, so common from that cause. Large bearings are introduced in every wearing surface, which, together with ample weight and extra quality of metal, secure in a high degree, economy in use. Rankin, Brayton & Co., of the Pacific Iron Works, in this city, have secured the exclusive right of manufacture for this coast, and are prepared to furnish these engines of all sizes from 20 to 500-horse power.

A QUEER MINING TUNNEL.—As a general thing miners' tunnels are pretty well run, as great care is usually exercised before operations are begun. In fact, very close work is done on this coast in mining surveying. Occasionally, however, bad mistakes are made. One in point is mentioned by the *Transcript* (Nevada county), where the parties sunk an incline and found a good ledge. They then went down into a ravine near by and started a tunnel to reach the incline. After running about 150 feet, they began to wonder that the ledge was not encountered, and had a survey made. The surveyor found that they had pushed the tunnel to within some 40 feet of the ledge, then in making a turn to avoid bad ground lost their bearings and started back nearly parallel with the first portion of the drift. Had they continued working in this manner a few days longer, they would have struck a ledge of daylight by emerging from the face of the bank less than a hundred feet below the point where they started, and thus had a tunnel with a double mouth. The boys feel badly sold, and say that hereafter if they want to dig a well even they will first get a surveyor to lay out the work for them.

Mining Outlook on the Comstock.

The Virginia *Enterprise* says: Of late people, both here and in San Francisco, have allowed themselves to tumble into the "Slough of Despond." It is much such a slough as that into which Bunyan's Christian fell, and of which he says: "Here, therefore, they wallowed for a time, and Christian, because of the burden that was on his back, began to sink into the mire." However, "Help" at length extricates Christian, sets him on his feet again and starts him off as good as new. It will be the same with the "Christians" who are now temporarily wallowing along "because of the burdens on their backs." They may not now see him, but "Help" is somewhere about and will presently lend them a hand.

Feelings of gloom and despondency are as much "catching" as are the feelings of elation and confidence experienced during the time of a great stock "boom." The sense of dejection spreads from man to man till whole communities are infected. It seems to be a thing that is in the air—in fact the whole atmosphere appears to be blue with it.

The tremendous yield of the "big bonanza" of the California and Con. Virginia is much to be blamed for the present grumbling and despondency. When a man's appetite has been for a year or two pampered and stimulated with highly-spiced viands he finds plain diet unpalatable and becomes a sort of chronic grumbler.

Previous to the discovery of the big bonanza the "grass" was really and truly very "short" on the Comstock. Very little bullion was being taken out anywhere, yet no such wide-spread feeling of despondency was observable as at present prevails, though our mines are now yielding over half a million dollars per month. Bullion is being shipped right along, yet people can hardly be made to pay the slightest attention to it, because the shipments are not such as they were wont to see in the days of the big bonanza.

Union Con. bullion, valued at $79,322.81, was shipped to San Francisco recently. This is the Union clean-up for March, and makes a total for the month of $360,806.80. The shipments of the north end mines for March are as follows:

Union Consolidated	$360,806.80
Ophir	18,612.40
California	28,411.80
Consolidated Virginia	151,386.01
Total	$559,217.01

During the three months of the present year bullion has been shipped as follows:

Sierra Nevada	$ 46,389.13
Union Consolidated	674,346.72
Ophir	138,026.19
California	231,379.52
Consolidated Virginia	473,776.86
Total	$1,553,918.42

Our people should "brace up." To be in "borasca" occasionally is the experience in all mining countries, but as truly as there is "borasca" just so truly and surely is there "bonanza." In everything there is good and bad—fat and lean.

In speaking of the present season of doleful dumps and the ups and downs of mining and life generally, we heard a man advise his friend to "hold up his head, even though the seat of his trowsers dragged the ground."

This was about as good advice as could well be given. Crying mends no broken pots. All things considered, mining is really no more discouraging than most other great branches of business. Let a man give it up and try ranching. It is all very fine while he is in "bonanza"—while the rains fall in their season and his crops fill his barns—but when he plows and sows for two or three years in succession and reaps nothing the case is different. He is in "borasca," but if he has the pluck to win in any business he does not give up, but plows and sows again.

A New Arizona Railroad.—A company has been organized at Tucson to build a railroad from the point where the Southern Pacific crosses the San Pedro river to Tombstone. The company is organized under and in accordance with the laws of the United States and Arizona, and is composed of the following officers: W. W. Williams, President; Hugh Farley, Secretary; and Messrs. Williams, Farley, Wm. Zeckendorf and Fitch, Farley & Pomeroy, Directors. The amount of capital is $1,200,000. A preliminary survey is already under way, under supervision of W. S. Edwards. After the completion of this a final survey will be made, and the work on the road is expected to commence as soon as circumstances and the well-known energy and means of the undertakers will permit. The road will be about forty miles in length, and will run from the San Pedro intersection via Contention and Charleston to Tombstone.—*Los Angeles Herald.*

Secretary Schurz has recommended to the House an appropriation of $500 to purchase the first patent ever issued in America. Accompanying it was a letter from E. T. Hall, of Columbus, O., the present possessor of the document, in which he says it was issued at New York, July 31, 1790, to Samuel Hopkins, of Philadelphia, for an improvement in making potash and pearlash. It is written on a sheet of parchment in a round, old-fashioned hand, signed by George Washington and certified by Edward Randolph, Attorney-General, as being conformable to the act of Congress to promote the useful arts, and its delivery to the grantee is certified by Thomas Jefferson, with the seal of the United States.

Coal Fields in Colorado.

In the southern part of La Plata county is an immense coal field, which extends from the valley of the Rio Les Pinos to the southeast end of Ute mountains. The field is in sandstones and shales of the cretaceous age, about 1,000 feet apart. The lower coal measure is in a zone of shady sandstones that are about 300 feet thick, and the coal is intermixed with shales and other impurities that render it worthless; but when separated from the shale, it is of excellent quality for domestic use. The lower measure is underlaid by a bed of dark gray shale, containing calcareous seams and nodules called septaria. The La Plata coal bed is located on a bed of whitish sandstone. It extends from the east end of the county for over 60 miles, and is crossed by the Animas river. The thickness of the entire bed between the floor and the roof is over 50 feet, and contains about 40 feet thick of good coal free from shale. The floor, of grayish white sandstone, is covered with a thin layer of clay and clay shale, varying from an inch or two to a thickness of two feet. Upon this a layer of compact, firm coal, 6 to 8 feet thick; then a layer of tough black shale, 1½ to 2 feet thick; upon this is a bed of excellent coal over 30 feet thick, with only small seams of shale at intervals of 4 to 10 feet. The "roof" is a tough, shaly sandstone, alternating with true shales for a distance of several hundred feet above the coal bed. In this overlying formation there are two or three small veins of coal, one of which is large enough for exploration.

The quality of coal has been tested in a crude way by coking it in pits and heaps, and by use in blacksmith shops, stoves and in open fireplaces, in all of which it gives good satisfaction. It is strongly bituminous, cinders well, and forms masses of coke in an open fire. It is exceedingly rich in gaseous products, takes fire readily and burns freely, leaving a brownish gray ash.

The working of these beds will be confined to the outcrop at the most convenient points where levels can be run for years. Its location will undoubtedly prevent it from being of any great commercial value; still it will prove to be a mine of inexhaustible wealth to La Plata and San Juan counties, in consequence of its coking qualities and adaptability to all kinds of metallurgical, mechanical and domestic uses. The material interests of San Juan and La Plata counties are inseparably interwoven by the drainage system of the San Juan river, the physical features of the country, and their mutual dependence on each other in many ways. San Juan has an abundance of the precious and useful metals, but can produce no food for her population. Her lowest mining camps are over 9,000 feet above the sea, and the highest peaks have an altitude of over 14,000 feet. La Plata raises vast quantities of meat, vegetables and grain, and supplies all demand for lumber, timber, coke and coal; but were it not for San Juan's needs, La Plata would have no market for anything, save cattle that could be driven to distant markets.—*La Plata Miner.*

Copper Mines.

Copper mines are now in demand in the New York market. This being the case it is probably worth while for people on this coast to give some attention to such mines. Copper is found in hundreds of places in California, and in this State we have some mines that promise well. There are many mines in the neighborhood of Peavine district that are rich in copper, though no work has been done on these except at or near the surface. Gold and silver are associated with most of the copper ores of that district, and the work done on the veins was more on account of a hope of finding those metals in paying quantities than with a view to doing anything with the copper.

In the vicinity of Pyramid lake in the early days some of native copper were found, specimens of which were brought to this city by prospectors, but since that time nothing has been heard of the vein or veins from which the samples were obtained.

In the vicinity of Walker lake are several large and rich deposits of copper. In that region some mining for copper has been done, the ore being used in the manufacture of blue stone (sulphate of copper) at Dayton. Parties who have given some attention to the matter say that there are several workable mines of copper in the direction of Walker lake, and that at one place is a large hill or mountain completely covered with copper ore of an excellent quality.

Once the branch railroad to Bodie is completed these mines are likely to prove valuable, as they cannot be far from where it will pass through. We must have in many places in this State ores that are richer than the majority of those now worked in the Lake Superior country.—*Territorial Enterprise.*

Silver ore has now been discovered at various points on or near the great Allegheny chain of mountains in Vermont, Pennsylvania, Maryland, Virginia and West Virginia, and these discoveries, taken in connection with the gold mines long known to exist in Virginia, North Carolina and Georgia, are sufficient to indicate that both the precious metals must abound in those mountain regions of the Atlantic States to a much greater extent than has been known or supposed.

Don't Exaggerate.

We might even put this in a more pointed monosyllabic form, but lest it should appear too rude, we tender this epigrammatic counsel "without prejudice" to all promoters of mining schemes, not only upon the ground that such a course is ethically improper, but upon the (to some) more convincing ground that it don't pay; that is, provided the promoter has a really valuable property to offer or any personal character to lose. It should be understood by all concerned in precious-metal mining that most of the tricks and dodges which sometimes, in the earlier stages of the industry, availed to place worthless claims, are fruitless now. This field has been so thoroughly exploited that the prospect of new and remunerative invention in the means and methods of swindling would be exceedingly slim, were it not that there is a new crop of fools every year.

A stake and a ten-foot shaft do not make a marketable mine. Nor do assays of specimen pieces from the location—or elsewhere. A statement published in some newspaper or book that a mine has yielded $50,000 when it has not yielded $500, is only so much time and energy thrown away. We have before us a volume containing many such misstatements, set forth with much art of presentation and letter-press—innocently and in good faith, so far as the author was concerned—who, in the lamentable absence of any authenticated data, could only take what was given to him by the unscrupulous mine-owner.

Nobody buys—or, at least, nobody should buy—a mine on such testimony. Vicinage (in fissure-veins) to a lode of established worth is no indication of value; and the immediate vicinity to a rich chimney is, as every practical miner and engineer knows, likely to be poor. A mining location must stand on its own merit. No one, unless he is personally familiar with the location and history of a mining property, should pay any considerable sum for it, except upon the careful examination and report of a disinterested expert; and with such, all the devices we have named go for nothing. The chances for the sale of any valuable mining claim are in all respects furthered by strict adherence to facts on the part of the owner or his agent, and are every way hindered by unfounded statements or exaggerations.

The editors of newspapers published at or near mining camps sometimes give currency to erroneous statements from no more directly mercenary motive than the desire to oblige their patrons or their neighbors, and to "help the country." Such editors should realize that unfounded stories of "finds" and "yields" do more than anything else to injure the prospects and defer the prosperity of a mining district. If credence is given them, they "develop" nothing but a formidable waste of money in unproductive ventures, which not only cripples to that extent means which might be otherwise advantageously used in profitable enterprises, but they insure "the country" a far more serious back-set in the impairment of that confidence which must not only be the precursor of capital, but the life of all solid business after it is obtained. Eastern men have paid large premiums in times past to dishonesty and ignorance; a net loss every way; for capital has been weakened without benefit to industry.

There is no reason why a gold or silver mine should not be operated with the same integrity of method and management as a railroad or a bank; and the time is near by when nothing less than this will be demanded of all such as in any way depend upon public opinion for a market.—*N. Y. Engineering and Mining Journal.*

A New Miner's Lamp.—A new miner's lamp has been invented, which, if it be adequately luminous, ought to be absolutely safe. The principle of the contrivance is the substitution of the light of phosphorescence for that of positive ignition, and the apparatus is described as being something like a tiny meat screen. The interior of the screen is covered with a brightly luminous paint, and it is even proposed to fit it up with a shelf or two, so that the pitman might carry in his lamp a "snack" of something to eat, whenever, during the intervals of work, he felt hungry. Of course it will be impossible to use this sort of lamp as a pipe-lighter, so that it is not at all likely, if it comes into general adoption, that its inventor will be very popular among the colliers. Still, if the apparatus can be made to work well it will be appreciated by pit-owners, to whom the destruction of property caused by an explosion is always a sore hardship. The great advantage such a lamp would have over that now in common use is that it guards against a peril from which the "Davy lamp" cannot protect the workmen. If that lamp be carried against a current of air mixed with fire-damp the explosive gas penetrates the gauze and comes into actual contact with the flame, and then naturally a catastrophe is the result. Obviously, no such risk is run by using a phosphorescent light in mines.—*London Daily Telegraph.*

The electric light at the Black Diamond Steel Works has been so successful that the lighting capacity of the apparatus is being increased from twelve to thirty-two lights, requiring two sixteen-light machines. This will be sufficient to illuminate the entire establishment, and will have the effect of rendering the interior of the works almost as light as day.—*Penn.*

The Comstock.

There can be no question that the depression in the Comstock is affecting injuriously the mining interests of the entire State in the eyes of Eastern investors. The idea prevails with them that the Comstock is "played out;" that it is not productive at great depth, and that it must soon be abandoned. Thinking thus, they class all other mining sections in Nevada in the same category, and away they go with their capital to the fresher fields of Colorado. It is this false idea that must be combatted at the East. Confidence must be restored in the wealth of the Comstock before we can expect a general mining boom in our State. A fair revival of prices, and a few dividend-paying mines on the Comstock just at this time would accomplish wonders for the rest of the State in the matter of attracting Eastern capital to a large number of languishing districts. The Comstock is not exhausted, and has not reached too great a depth to pay. Experience teaches that the bonanzas of the grand old lode have steadily improved in wealth with depth. The following figures from the Gold Hill *News*, discloses a state of facts which deserve to be attentively considered:

Between the surface and the 1000 level of the Comstock 12 bodies of ore have been worked out, yielding 3,520,309 tons of ore, of an average value of $29.65 per ton, and have produced $103,425,074 in bullion. The net profit of working these bodies has been $22,813,280, which sum has been returned to stockholders in dividends.

Between the 1000 and 2000 levels two ore bodies have been up to the present time uncovered, and one of these has been worked out. The first was in Belcher and Crown Point, and the second in Con. Virginia and California, and is not yet exhausted. Up to January 1, 1878, these two ore bodies yield 2,413,124 tons of ore, averaging $61.50 per ton, and producing $148,466,629 in bullion. The net profit in working these bodies up to the date above mentioned was $84,366,000, as per the return to the stockholders in dividends.

These figures show that while the quantity of ore extracted between the 1000 and 2000 levels was 1,107,185 tons less than the amount which the lode yielded between the surface and the 1000 level, the bullion product of the former was $45,041,555 in excess of the latter, and the net profit realized in dividends from the lower section was $61,522,720, or nearly 400% greater than in the upper.

Mining.—The year 1880 will long be remembered as that in which more extended legitimate mining operations will be successfully carried on than any in the previous history of mining. Arizona, New Mexico, Utah, Idaho, Montana, Colorado, Washington Territory, Oregon, California and Nevada will be thoroughly prospected. Tens of thousands of miners will be crevicing in our mountains and hills, when new and rich finds must, in all those mineral sections of country, be found. Thousands will fall by the wayside, victims to the toils and hardships of the prospectors' life, and other thousands by the hand of the savage scalp knife. Yet the work will proceed and the riches of our mountains brought to the light of day and the use of man; millions of capital in the East will be invested which is now lying idle, and the promise of rich yields from many new bullion producers will be the result. The Comstock, with its ponderous machinery and deep workings will be opened up at fabulous depths. The yield from the Bodies will continue to increase, and the 26 hoisting works now on prospecting mines, many of which possess merit of the best character, give almost positive assurance of being dividend paying properties before the snows of another winter fall, and is a good and substantial basis for confidence in mining securities, and the perfect safety of investment when properly and legitimately conducted.—*Bodie News.*

Sluice Mining in the Black Hills.—The indications for an active mining season, especially in placers, were never better than at present. Unusual preparations are going ahead in the gulches hereabouts. Bedrock flumes are talked of on every hand, and County Commissioner Allen already has a large force of men at work in Deadwood gulch just below Gayville. Another one will probably be put in on the Whitewood below Elizahethtown, while the ordinary placer boxes are being fixed up everywhere. Many of the claim owners who would not wash the gravel during the flush days of placer mining in the Hills are returning to first principles, and are themselves now willing to work for $5 or $6 a day on their own grounds. The Spring creek flume, if it gets through all right, will give the placer interests of the Hills a big boom. The Bear gulch miners are determined the present season to see what there is in the dirt of their country. On the whole, it is thought that more sluicing will be done this spring and the coming summer and fall than during any year since the opening of the Hills, and that the amount of dust taken out will be exceedingly encouraging.—*Black Hills Times.*

Use of Oleomargarine.—Suit pending in the United States Court concerning the oleomargarine patent, which has brought out the fact that oleomargarine, which is never quoted in the market, and which is not kept by any merchant as such, has a sale in the country of 98,000,000 pounds per annum.

MECHANICAL PROGRESS.

A Method of Constructing Factory Floors.

A curious method of laying floors is used in France when great solidity is needed, and which has obtained a wide application. It consists in putting down a floor, not, as usual, on sleepers, but in embedding the boarding in asphalt. Pieces of oak, usually about 2½ to 4 inches broad and 12 to 30 inches long and 1 inch thick, are pressed down into a layer of solid asphalt, not quite half an inch thick, in the well-known herring-bone pattern. To insure a complete adhesion of the wood to the asphalt and obtain the smallest possible joint, the edges of the pieces of wood are planed down, beveling toward the bottom, so that their cross-sections become wedge-like. It is stated that these floors are used mainly for ground stories, in barracks and in hospitals, and that they have been laid in the numerous newly-constructed forts around Metz. A number of advantages are cited in connection therewith. A plan in some respects resembling this has been employed in the construction of the floors in a new factory recently erected by Messrs. Bliss & Williams, Brooklyn. It is similar, however, only in some of the more unusual features, the details being altogether different. Sleepers are employed, but instead of stretching between supports they are solidly bedded in concrete. Upon them planking is placed, each plank as laid being bedded in hot tar.

One of the most annoying points of many otherwise well-built factories is their poorly constructed floors. A tight, smooth, strong and durable floor is what is wanted, but in floors as commonly constructed some of these qualities, at least, are lacking. A floor on which heavy machinery can be placed without regard to the position of beams and girders, is a rarity. Floors which have to rest upon the ground, as ordinarily built, are constantly wearing out and are never to be depended upon. The construction employed in the factory above mentioned combines all of the desirable qualities which we have mentioned, and avoids the objectionable features. The business conducted in this factory, which is the manufacture of presses and dies, is such as will test any floor quite severely. Accordingly, whatever construction is satisfactory in this case is very likely to prove desirable in other instances.

The following description shows the construction employed: The surface of the ground under the top earth had been removed was thoroughly smoothed and rolled. Four inches of concrete was then applied, and while this was wet locust stringers were bedded in it. These stringers were spaced about 30 inches between centers. After the concrete had become perfectly hard and solid, 2-inch planks of Georgia pine were laid, each plank in turn being bedded in hot tar, which was spread on to the concrete just fast as the planks were laid and spiked. The result is a floor upon which the heaviest machines can stand in any convenient position without the necessity of any special foundations. Moreover, it is water-proof, damp-proof, and no miasma can arise from the ground through it. The floor of this kind is both cheap and solid, but the advantage which will appeal to every factory owner and builder is that such a floor will last until worn out from the top. There can be no decay from the under side.

It is reported that floors constructed upon this general plan have been in use in some of the oldest factories upward of twenty-five years. They have not, however, come into general use.

LEATHER GEAR WHEELS.—A genius in Mezingen, Wurtemburg, has devised a process for making toothed wheels of leather instead of metal. The advantages claimed for them are that they have a much quieter and more elastic action, are extremely durable, and require no lubrication whatever. They are prepared from raw, untanned buffalo hides, thoroughly cleansed from all hair, flesh, etc., and glued together in many layers as are necessary to produce the breadth of wheel required. The cementing is effected under very heavy pressure, as in an hydraulic press, and this is kept up until the glue has completely hardened. From the slabs, or plates, thus prepared, the teeth are cut out by saw and chisel. Why not leather car wheels as well as paper car wheels?

AN IMPORTANT FACT.—At a recent meeting of the Manchester Geological Society, Mr. Peter Spence gave the following important information. He said that no boiler on his works had been chipped for the last 15 years. This was simply due to his keeping the water supplied to the boilers alkaline, by adding from time to time a little carbonate of soda or soda-ash. Mr. Kasman finds that zinc, introduced into steam boilers to prevent incrustation, effects the purpose where the waters are selenitic; but where the waters contain carbonates of lime, magnesia and iron, zinc first becomes brittle and porous, and then is rapidly reduced to powder.

FITTING A KEY TO A DRIVING WHEEL.—The key should not be fitted to bear hardest on the ends. It should have a close fit at the sides, but have no draft; all the draft should be on the end and bottom.

Form of Riveted Joints.

A recent exhaustive report on the above subject says: A riveted joint is in a certain sense an imperfect part of a structure. It cannot be so designed as to be throughout uniformly strained. It has always certain surfaces markedly weaker than the rest, at which consequently deterioration of the material or fracture by the action of the load is liable to occur. These surfaces of weakness are so related that in general the increase of one involves a diminution of the other. The joint, therefore, which will carry the greatest load before fracture will be that in which the stress reaches the breaking limit for each of these surfaces simultaneously. Since the rivet section can in general be increased only at the expense of the plate section, in the strongest joint the rivet and plate will reach their breaking point under the same load. It would seem, therefore, that the proportions of a riveted joint could be determined by the ordinary rules of applied mechanics without the need of experiment. That this is not so is probably mainly due to a second condition of imperfection in riveted joints. To apply the ordinary rules for the strength of materials to riveted joints, it is necessary that the distribution of the stresses on the surfaces of weakness should be known. If those stresses were as uniformly distributed as in an ordinary bar tested for tension or shearing, the problem would be simple. But in fact the stresses are less uniformly distributed, and the law of their distribution is unknown. Consequently the average stress on the surface of fracture of a riveted joint, when broken by a load, is less than it would be if the stress were uniformly distributed, and needs to be determined by special experiments. Further, it may be different for different forms of joint. This average stress, always less than the maximum stress which causes fracture, is here termed the apparent breaking stress. Hence the chief object of experiments on riveted joints is to determine the apparent breaking stresses, (1) for the different surfaces at which each joint may fracture, (2) for the different forms of joints.

In certain cases allowance may have to be made for progressive deterioration of a joint, by corrosion or otherwise, which reduces the strength in certain directions more than in others. No experiments showing the amount of deterioration in such cases appear to have been made.

On the Use of Screws.

At a recent meeting of the Polytechnic Association an interesting discussion on the proper mode of using screws took place. It was contended by some speakers that the hold on the wood obtained by an ordinary wood screw would be no less if driven nearly home with a hammer, and then given a few half turns, than if driven all the way with a screw driver. It was asserted, as the experience of a builder doing a large business in New York and Brooklyn, that they held just as well. The conclusion finally reached was that much depended on the character of the wood. One of the members present had made tests with a weighing instrument, and found that it took 28 pounds to draw a certain screw driven mainly by a hammer, and 52 pounds to draw its mate, driven all the way by a screw driver. In hard wood, as that used for furniture, a hole should be bored large to the depth of the plain part, and smaller the rest of the way, quite to the bottom. In soft wood no hole at all was better. The screw, by compressing the wood, got a firmer material to hold in. The president remarked that the general results or experience of an intelligent workman was valuable, even if not carefully measured, in any case, and not subject to the repetitions and comparisons which are requisite to dignify a test with the title of "experiment." But many, he thought, worked without getting experience in the sense of knowing the result at all, and cited numerous examples. Inquiry was made as to screw spikes specially intended to be driven by a hammer, having only one or two turns in their whole length. A gentleman present had used such in railroad ties to hold the rails. They were excellent, but were not approved for railroad spikes, because they held too tenaciously. It was absolutely necessary in railroad work to sometimes draw out spikes, and it was found too difficult to do it with the twisted ones.

CAST-IRON MAGNETS.—Cast-iron magnets are made by M. Carre, by melting soft metal very slightly carbureted in crucibles, adding from 10% to 15% of steel filings, and running it into molds. If 1% to 1½% of nickel be added to the mixture, and from 25 to 30·1000ths of copper, or 2% of tin and 50·1000ths of copper, the molded iron can be tempered at a cherry-red heat. The best result is stated to be obtained by tempering pure cast iron at as high a temperature as the molded pieces will stand without distortion or fracture.

TO DISCOVER FLAWS IN SHAFTS OR DEFECTS IN WELDS.—If a piece of iron appears to have an unsound weld, or if it has a crack apparent upon the surface and it is desired to know how deep it penetrates, heat the part to be tested to a red heat and pour a fine stream of water upon the faulty spot, but mainly on one side of it, and the iron on that side will lose its redness more rapidly than the other side, and plainly indicate how deeply the defect extends.

THE STEEL TRADE OF THE WORLD.—The total capacity of the steel mills at the present time throughout the world is about 3,000,000 tons per annum. In the United Kingdom there are 120 Bessemer converters built, of which over 80 are at work, and the annual yield from these is considered as from 755,000 to 800,000 tons. The American make is estimated at 750,000 tons, the next largest producer being Germany. Two years ago there were 25 converters in Prussia working out of the 50 built, and turning out 375,000 tons, which were increased by the works in Saxony and Palatinate to 400,000; and since the revival of trade fresh converters have been put in operation. The estimats of the French steel manufacture is about 275,000 tons; that of Belgium, 150,000; of Austria, with 32 converters, 250,000; and of Sweden and Russia, 150,000. To all this it is proper to add that the steel capacity of the United States is being largely increased.

TO DISTINGUISH DIFFERENT KINDS OF IRON. A correspondent of the *Blacksmith and Wheelwright* says: To test different kinds of iron a charcoal fire should be made or a hollow fire of coke or coal that is free from sulphur. In this, heat a piece of Burdon best, welded to a piece of cast steel. Swedish iron is easily detected by the sparks before a welding heat. Norway, Burdon or any other soft iron looks like a piece of fat pork when a good heat is up. Green coal, with dirt or sulphur in the fire, gives a darker color to the heat. A hollow fire is the best. Do not permit the coal to touch the iron when it is approaching a white heat. There is as much difference in Norway irons as there is in refined irons, and similar differences can be found in Low Moor, even in the same bar.

A PLASTERING MACHINE.—A machine for plastering walls has been invented, which consists of a receptacle for the mortar, the segment of a cylinder in form. It is provided with a hinged plate that presses against the mortar, and, as the receptacle is moved upward against the wall, presses the plaster out through a narrow-ganged opening at the bottom.

SCIENTIFIC PROGRESS.

A NEW WAY OF HEATING RAILWAY CARRIAGES.—It is reported from Lyons that the Compagnie Paris-Lyon-Mediterranee is now trying a new method of heating in express trains. The method was proposed by M. Ancelin, an engineer, and consists simply in the use of acetate of soda in the foot-warmers. The substance has considerable latent heat; dissolving at a certain temperature, it thus absorbs a large quantity of heat, which becomes sensible during crystallization in cooling. All that is required is to fill the ordinary cases with a sufficient quantity of the acetate, close them, and place them in a stove at about 100°. The cooling of a case thus charged and heated takes twelve to fifteen hours. The warmers are thereafter taken from the compartments and placed in a stove (where the crystals of soda acetate are redissolved); they are then ready for fresh use. The advantages of such a system are obvious—no necessity of changing warmers every two or three hours, or of maintaining a numerous body of men at stations to attend to them; economy in cost of heating, etc. Moreover, most of the existing foot-warms can be utilized. Acetate of soda is not very expensive, and it could easily be manufactured in much larger quantities than at present if the demand required it. The new system has been tried on the express train, No. 5, leaving Paris at 7:15, and reaching Perrache at 4:31. The compartments were each supplied at starting with two warmers containing acetate of soda. At Perrache most of the warmers were still so hot that one could not apply the back of the hand to them. From Lyons to Marseilles the train was heated on the ordinary system.

CRYSTALLINE GLUCOSE.—Peligot has been making some experiments with glucoses, the results of which he has communicated to the French Academy of Sciences. When glucose is subjected to the action of alkalies a crystalline substance is produced, to which the name of "saccharose" is given. This product has the same composition as cane sugar, but is readily distinguished from it. Saccharose when tasted leaves a perceptibly bitter taste in the mouth, and it does not ferment in the presence of yeast. He has found, also, that true saponification occurs when glucose is acted upon by lime.

A FORTHCOMING REPORT ON EDISON'S LIGHT. It is reported that, in view of much unfavorable criticism, Mr. Edison decided, some time ago, to submit his whole plan for *electric lighting* to the critical examination of experts. It is intimated that Profs. Barker and Rowland have been at work upon a report of this kind, which will shortly be made public. As Prof. Barker is known to be one of Mr. Edison's stanchest supporters, the tenor of this report will not be difficult to predict.

A MENSTRUUM FOR CARBON.—London *Nature* is authority for the statement that Dr. Sidney Marsden, an experimenter in the field of crystallizing carbon, has discovered a menstruum in which carbon is soluble, and from which it crystallizes partly as graphite and partly as diamond. The crystals of the latter are octohedral in form and readily scratch sapphire.

Interglacial Quartz Workers in Minnesota.

In 1876, Prof. Winchell found in and around Little Falls, Minnesota, a number of fragments of wrought quartz in surface deposits underneath the remains of the mound builders. Prof. Winchell, accordingly, fixed the era of the quartz workers between that of the mound builders and the close of the glacial epoch.

At a late meeting of the Historical Society, at Minneapolis, Minnesota, Francis E. Babbit gave an account of a considerable deposit of quartz chips and implements found in regular strata, which must have been formed before the close of the glacial period. The specimens consist of hammers, implements, etc., both finished and unfinished, together with the chips struck off from the articles in the process of manufacture. The material of which they are composed is principally compact, lustrous quartz, frequently mottled as if selected with an eye to the artistic beauty. The stratum is some few inches in thickness, and lies in the soil a few feet below the surface. The appearances indicate that this was once the site of a manufactory of such quartz objects, and this idea is upheld by various considerations. There are tools found such as would be used in the manufacture of quartz articles, and the whole stratum is mixed with chips, which in many cases appear stuck in the dirt just as they fell from the hand of the unknown. Unfinished implements are also found in more or less advanced stages of manufacture. It is not possible to fix the precise point occupied by these remains in the scale of the glacial epoch until the drift features and surrounding formations of the locality shall be better understood than now. Still it is certain that the remains belong to a people living before the end of the last glacial period, because they are deposited in a drift which is known to be of glacial origin. The hard pan upon which the quartz formations lie is probably of the first glacial period, and the quartz may belong to an interglacial epoch.

LIGHT AND HEAVY BLOWS.—The difference in effect between a blow delivered by a light hammer traveling fast, and one delivered by a heavier hammer traveling more slowly, is that the effects of the blow are more confined in the first case, and more spread in the second. The blow from a light hammer penetrates but slightly below the surface; while a blow from a heavy hammer penetrates deeply into the metal which is being forged. In practice it will be observed that light quick blows, have a tendency to drive out of shape, split and break the iron; while the force of heavy blows, with a heavy hammer, going slow, penetrates deeply into the iron and forces the mass of the metal out into the desired shape. Every wood-chopper knows the difference in effect between the effort to drive a wedge into a tight place by light blows or by heavy ones.

SNOW-COVERED GROUND.—A paper by M. Bequerel was read recently before the French Academy of Sciences on the temperature of snow-covered ground. The author maintained that snow of itself does not protect from frost the bodies covered with it. It acts, indeed, as a screen preventing radiation, and gives water, at a temperature just above the freezing point, which filters through the ground, but below that temperature it undergoes, like other bodies, variations of temperature which may be transmitted. If, however, straw or similar substances had been laid on the ground before the snow fell, there would be a greater probability that organic bodies in the earth would remain uninjured by subsequent frosts.

PUNCHING IRON.—An interesting experiment was reported at the last meeting of the Engineers' Club, of Philadelphia, by Mr. Percival Roberts, to show the small quantity of iron that is removed in the process of cold punching that metal. A section of a partly punched nut was exhibited, etched by acid, to show the *solid metallic flow* of the metal induced by the cold punching process. The section demonstrated that only 40% of the volume of iron leaves the hole, thus proving that a cold-punched nut must be much stronger than one that is hot punched.

ARTIFICIAL OLIGISTE.—An interesting account of the artificial production of oligiste is given in the *Italian Chemical Gazette:* Pieces of lava from Vesuvius were placed in a concentrated solution of common salt and then introduced into a bottomless crucible, where they were subjected to the heat of a Bunsen burner for several days. At the end of that time the fragments were seen to be covered with hematite, and scales of oligiste were scantily dispersed over the surface.

TOUGHENED glass has been found by M. Dncretet to oppose a much greater resistance to the passage of electricity than common glass, and he has employed it in constructing Leyden jars which are capable of receiving a much heavier charge than those of ordinary glass. Becquerel has suggested that this product may probably be used in the construction of extremely thin condensers capable of giving great effects.

HABITS OF FISHES.—It has been long known that fishes return to about the same place in the same rivers each year to spawn, but it is a recent discovery that they go up the left hand side of the stream and coming down take the opposite side. Fishermen may be benefited by remembering this.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 1.		Week Ending Apr. 8.		Week Ending Apr. 15.		Week Ending Apr. 22.	
Alpha	7½		7	5½	7	6	7	6¾
Alta	3.70	3.40	2.60	2¼	2.90	2.40	3.30	2.85
Andes	80c	60c	90c	75c	1¼	95c	1.30	95c
Alpha						30c		
Argenta	1.10	65c	85c	55c	55c	50c	55c	46c
Atlantic								10c
Aurora Tunnel					45c			
Baltimore Con	25c							
Belcher	4¾	3.55	3½	2½	2.95	2.15	3	2.40
Belmont	20c		35c	15c	40c	35c	40c	30c
Best & Belcher	10	9¾	9¾	8¾	13¾	8½	12¾	10¾
Bullion	3.90	3½	3¾	2.70	3.40	2¾	3.35	2.80
Bechtel	1.85	1.80	2	1¾	1.80	1.60	1½	
Belle Isle	1.00	1.05	1.05	80c	75c	50c	65c	55c
Bodie	11	9	9¼	8¾	9	7½	8¾	8¼
Benton	2.60	2.30	2.20	1.35	2	1.65	2¼	1.80
Bulwer	7¼	7¼	9¼	7¼	6¾	5¼	6¾	6¼
Boyle								
Black Hawk	90c	70c	80c	70c	75c	65c	1	70c
Belvidere	3	2.80	3¼	2¾	3¼	2.60	3¼	3.05
Booker	55c	50c	60c	50c	50c	45c	50c	45c
Caledonia	1.10	1	1	80c	90c	60c	95c	85c
California	3.05	3	2¾	2¼	2.90	2¼	2.60	2.60
Challenge	1.60	1¼	1.55	1¼	1.70	1¼	1.85	1.65
Chollar	5¼	5	5¾	5	5¾	4.60	5	4¾
Confidence	7	6¾	7	5¾	6¾	4¾	6¾	6¼
Con Imperial	50c	45c	45c	35c	50c	35c	45c	40c
Con Virginia	3.45	2.90	3.05	2.65	3¼	2.55	3¼	3.20
Crown Point	3	2.60	2.45	1.80	2¼	1½	2¼	1.95
Con Washoe								
Champion	1.20	45c	1¼	75c	1	35c	1.10	90c
Concordia	1¼	80c	1¼	80c	1.10	1	1.20	1.05
Dayton								
DeFrees								
Daney								
Day	80c	70c	90c	80c	1.15	75c	95c	85c
Eureka Con	19¾	19¼	19¾	18	19	18	19¾	18¾
Exchequer	3	2¾	2.60	2¼	2.80	2.15	2.70	2.40
Endowment	10c	5c	30c	25c	30c		30c	25c
Gen Thomas								
Grand Prize	1.55	95c	1.40	90c	95c	70c	95c	75c
Gila					20c			
Golden Chariot								
Golden Terra								
Goodshaw	45c	35c	40c	25c	35c	30c	35c	30c
Gould & Curry	5¼	4¾	4¾	4.10	6¼	4	5¾	5¼
Hale & Norcross	5	5⅛	5¼	4.80	5¾	4.60	5¼	5
Hillside			75c	60c	75c	60c	30c	25c
Highbridge								
Homestaka								
Hussey								
Independence	1.05	1	1	90c				
Julia	1.10	1	1.45	80c	1.35	1.05	1.35	1.10
Justice	1.70	1.55	1.55	1¼	1¼	1.15	2.05	1¼
Jackson	4¼	3¼	4	3	3		4	3
Joe Scates								
K K Con	4	3¾	4¼	3.95	3¾		4	
Kentuck	3		3	2½			3	2.90
Kossuth								
Keystone								
Lady Bryan			20c	15c			20c	
Lady Wash	65c		65c	50c	60c	55c	70c	55c
Laopard			10c					
Leviathan	35c		35c	30c	30c	25c	35c	20c
Leeds			30c		30c	25c	25c	
Lee								
May Belle	25c	20c	25c	20c	15c		25c	15c
Modoc								
Manhattan	85c	80c	1.05	1	1		1	
Martin White	35c		35c	25c	50c	40c	35c	25c
McClinton	85c	65c	80c	60c	70c	55c	50c	50c
Meadow Valley								
Mexican	14	13	13½	10	10½	9¾	10½	10
Mides								
Morning Star								
North Con Virginia								
New York	35c	27c	30c	15c	25c	15c	25c	20c
Northern Belle	17½	16¾	18	17¼	17¾	16	15¾	13
New Coso								
Navajo	35c	25c	35c	25c	40c	30c	40c	25c
Occidental	1.40	1	1½	70c	2.60	1.30	2.05	1¾
Ophir	17½	16¾	15¾	11¾	11	9¾	10¾	10¼
Oriental					50c			
Overman	2.05	1.80	2	1.10	1.65	1¼	1.55	1.40
Panther								
Phenix					2			
Phil Sheridan								
Potosi	3.85	3¾	3.85	2.90	3¾	2¾	3.70	3.60
Prospect								
Raymond & Ely	75c	40c	60c	35c	35c	25c	30c	25c
Richer								
Rock Island								
Rye Patch								
Rough & Ready								
Savage	6¼	5.05	5	3.95	4.35	3.55	4¼	3.95
Seg Belcher								
Sierra Nevada	21¾	19¾	20	15¾	15¾	14¾	16	15
Silver Hill	70c	60c	70c	55c	55c	55c	75c	60c
Silver King	5	5¾	5		5	4¾	5	4¾
Silver Prize								
Succor								
Summit	1.15	1	1¼	1.10	1.15	1	1.10	
Scorpion	3	2.85	2.80	2¼	2.50	2¼	2¼	2.15
Solid Silver					16c		10c	
South Bodie	65c	50c	50c	40c	35c		30c	
South Standard	25c		20c	15c	10c			
Star	25c		25c		25c		25c	
St. Louis								
Syndicate	1¾		1.40	1	1¼	1.40	1.40	1.20
Tioga Con	2¼	2¼	2.60	2	2.05	2	2	1.90
Tiptop			4¼	4	5		6	5
Trojan	30c		10c					
Union Con	38¾	35¼	33¾	26	28¾	25	26	24¼
Utah	10	8¾	10¾	8¾	11	8¾	12¼	9¾
Vermont Con								
Ward	1¾		1.65	1¼	2¼	1.65	2¼	2
Wells-Fargo			5c					
Woodville								
White Cloud								
Yellow Jacket	3¼	7⅝	7⅝	6¾	7¼	6¾	7¼	7¼

Sales at S. F. Stock Exchange.

Friday A. M., Apr. 16.

445 Andes.....1.20@1¼
60 Alte.....2.90@2.85
50 Alpha.....5¾
425 Belcher.....2.40@2.45
365 Best & Belcher..11¾@11¾
185 Benton.....1¾
95 Bullion.....3.35@3.30
80 California.....2.80@2¾
240 Con Virginia.....3¼@3.20
185 Chollar.....4.95
90 Crown Point.....2.95
110 Con Imperial.....40@45c
150 Caledonia.....90@85c
20 Challenge.....1.65
900 C Dorado.....1.30@1.35
20 Confidence.....61
50 Essex.....1.80
25 Exchequer.....2¼
1000 Flowery.....10c
600 Golden Gate.....25c
270 Gould & Curry.....5½@5¾
120 Hale & Nor.....5¼
300 Julia.....1.35@1.30
450 Justice.....1.55@1½
100 Kentuck.....2.90
150 Lady Wash.....55@60c
20 Lady Bryan.....20c
195 Mexican.....10¼@10
590 N Bonanza.....20@15c
600 New York.....25c
310 Occidental.....2@1.95
260 Overman.....1.55@1.40
270 Ophir.....10@10¼
200 Potosi.....3.65
120 Savage.....4@3.95
180 Scorpion.....2¼@2.40
250 Silver Hill.....65@60c
140 Sierra Nevada.....15¾@15¾
135 Union Con.....24¼
120 Yellow Jacket.....7¼

SATURDAY A. M., Apr. 17.

210 Alpha.....2¼
200 Addenda.....85@90c
1276 Alhion.....50@55c
225 Boston.....1.10
800 Albion.....75c
500 Argenta.....55@56c
1700 Atlas.....5c
20 Addenda.....90c
200 Belle Isle.....60@65c
535 Best & Belcher...11¾@12
1195 Belcher.....2¼@3
220 Bullion.....3.30@3.35
700 Belmont.....30c
290 Benton.....2¼@2.35
50 Black Hawk.....90c
100 Belvidere.....3.05@3.10
350 Booker.....45@50c
330 Boston.....1.10@1.15
10 Bodie.....8¾
20 Bechtel.....1¾
100 Belding.....60c
180 Buiwer.....6¼@6¾
650 Champion.....1@1.05
450 Con Virginia.....3.30
110 Confidence.....6¾@6¾
250 Caledonia.....90@85c
700 Challenge.....1.85
110 Concordia.....1.15@1.20
265 Crown Point.....2.15@2¼
555 Con Imperial.....40@45c
180 Chollar.....4.80@4.90
450 California.....2¾
110 C Pacific.....3¼@3.30
475 Caledonia (B H)...2¼@2¾
50 Dudley.....75c
250 D Standard.....60@65c
300 Day.....85c
320 Exchequer.....2.70@2.60
100 Eureka Con.....19¾@19¾
350 E M Diablo.....60@50c
340 Gould & Curry.....5½@5¾
400 Grand Prize.....75c
300 Golden Gate.....25c
1050 Goodshaw.....30c
25 Gipsy Queen.....1.05
340 H & Norcross.....5¼@5
175 Hillside.....30c
30 Holmes.....75c
1420 Justice.....1¾@1.80
10 Jackson.....3
625 Julia.....1.30@1.20
100 Jupiter.....1¼
170 Lady Wash.....65c
95 Mexican.....10¼@10½
200 Mackey.....10c
200 Mt Potosi.....1.10
330 Manhatten.....1
100 McClinton.....50c
40 Mammoth.....2.40
200 May Belle.....25c
125 Mouo.....7@7¼
750 N Bonanza.....15@20c
425 New York.....25@20c
450 Noonday.....1.30@1.35
1000 Navajo.....35@40c
75 Northern Belle.....15¾
300 N Noonday.....5¾
205 Ophir.....10¼@10⅝
428 Occidental.....2@2.05
320 Overman.....1¾
70 Oro.....5@4¾
170 Potosi.....3.70@3.65
50 Paradise.....50c
410 Queen Bee.....45@40c
500 Raymond & Ely.....25c
100 Red Cloud.....80c
185 Savage.....4.15@4¼
300 Sierra Nevada...15¾@15¾
200 Solid Silver.....10c
220 Silver Hill.....75@70c
100 Scorpion.....2.45
50 Syndicate.....1.20
200 S Bulwer.....55c
100 Silver King.....4¼
80 Summit.....1.10@1
170 Tioga Con.....2
160 Tiptop.....5
525 Union Con.....25¼@28
110 Utah.....11@11¼
200 University.....30c
360 Ward.....2¼@2.20
150 Wales.....3
465 Yellow Jacket.....7¼@7¾

Monday A. M., Apr. 18.

700 Alpha.....7
140 Alta.....3¼
510 Andes.....1.05
800 Belcher.....2.70@2.85
225 Bullion.....3.30
665 Best & Belcher...12¼@12¾
375 Benton.....2.15@2.10
140 Crown Point.....2¼@2.20
230 Con Imperial.....40@45c
700 Con Dorado.....1.30@1.35
445 Con Virginia.....3.40@3¼
100 Caledonia.....95c
500 Challenge.....1.85@1.80
355 California.....2.60@2.65
190 Exchequer.....2.65@2.70
100 Essex.....2.00
620 Gould & Curry.....5¾@5¾
200 Golden Gate.....25c
275 Hala & Nor.....5¼
375 Julia.....1.30@1¼
635 Justice.....2¼@2.05
50 Kentuck.....1¼
30 Leviathan.....20c
60 Mexican.....10¼
50 Mackey.....13c
925 N Bonanza.....10@25c
500 New York.....25c
20 Occidental.....75c
125 Ophir.....10¾
95 Overman.....1.40@1.45
1300 Silver Hill.....75@70c
90 Sierra Nevada.....15¾@16
255 Savage.....4¼
155 Scorpion.....2.45@2.35
190 Union Con.....25¼@25
60 Ward.....2.10
75 Yellow Jacket.....7¾

AFTERNOON SESSION.

300 Alhion.....65@70c
400 Addenda.....85@90c
450 Belmont.....30@35c
100 Belle Isle.....50c
90 Bulwer.....6¼@6¾
205 Bodie.....8¾
200 Black Hawk.....60c
200 Booker.....50c
170 Belvidera.....3¼@3.15
50 Boston.....1.10
700 Champion.....1.05
720 Concordia.....1.20
50 C Pacific.....3¼
400 Day.....85@90c
540 D Standard.....65c
30 Eureka Con.....19¾@19¾
20 E Mt Diablo.....70c
300 Endowment.....30c
200 Goodshaw.....35c
100 Grand Prize.....60c
50 Ginsy Q.....1
20 Hillside.....30c
175 Jupiter.....1¼@1¼
50 Jackson.....3¼
600 May Belle.....25c
50 Metallic.....1.20
20 Mt Diablo.....20
385 Mt Potosi.....1.10@1
250 M White.....25@30c
600 Mammoth.....2.40
100 Noonday.....5¾
140 N Noonday.....6
200 N Belle Is.....30c
400 Northern Belle...14¾@14¾
1040 Navajo.....30@35c
325 Oro.....4¼@4¾
200 Paradise.....45c
550 Queen Bee.....45c
50 Real del Monte.....1.40
430 Raymond & Ely...25@30c
75 Syndicate.....1.30@1.40
50 Star.....25c
170 Summit.....1@1.05
50 Silver King.....4¾
20 Tiptop.....5c
45 Tioga Con.....2
150 University.....30c

Tuesday A. M., Apr. 20.

260 Alta.....3
360 Andes.....1@1.05
555 Best & Belcher...11¼@11¾
60 Benton.....2
630 Bullion.....3¼@3.05
100 Belcher.....2¾@2.80
55 Confidence.....6¼@6¾
450 Con Imperial.....40@45c
300 Con Virginia...3.30@3.35
50 Confidence.....6¼@6¾
60 Crown Point.....2.20
120 Con Dorado.....1.35
70 Caledonia.....85c
20 Challenge.....1.70
100 Essex.....1.80
300 Gould & Curry.....5¼
30 H & Norcross.....5¼@5
100 Julia.....1¼
360 Justice.....1¼@1.65
100 Kentuck.....3
700 Leviathan.....20@25c
300 Lady Wash.....60@65c
50 Mexican.....10
100 Mackey.....10c
750 Mt Diablo.....60c
500 Mackey.....10c
100 Essex.....1.80
300 Savage.....4.10@4.20
100 Sierra Nevada...15½@15¾
100 Silver Hill.....70c
100 Sierra Nevada...15¾@16
300 Scorpion.....2.30@2.40
100 Silver King.....4¾
100 Union Con.....24¾
200 Ward.....2.05
415 Yellow Jacket.....7¼

AFTERNOON SESSION.

20 Argenta.....45c
200 Almon.....60@55c
100 Addenda.....80c
1100 Belmont.....40c
100 Belle Isle.....50c
60 Bodie.....8¼
105 Bulwer.....5¾@6c
100 Belding.....50c
100 Black Hawk.....90c
140 Booker.....50@45c
200 Champion.....95@90c
Best & Belcona (B H)...
350 Day.....90c
210 Dudley.....50@45c
100 D Standard.....65c
100 Eureka Con.....18¾@19
50 E Mt Diablo.....55c
250 Endowment.....30@25c
50 Grand Prize.....75c
100 Hillside.....30c
50 Manhattan.....1
20 Mt Potosi.....1.10
20 Mono.....62
35 Mammoth.....2¼@2.40
50 Martin White.....30c
100 McClinton.....50c
120 Mt Diablo.....19¾
145 Northern Belle...15¾@15¾
180 Noonday.....4¾
150 N Noonday.....5¾
150 Oro.....4¾@4¾
200 Queen Bee.....45c
75 Red Cloud.....50c
100 Real del Monte.....1.40
420 Raymond & E.....25c
100 Summit.....1.05
250 S Bulwer.....55c
165 Silver King.....4.90
200 Tioga.....1.10
200 University.....30c
100 Utah.....10
150 Union Con.....24¾
20 Ward.....2.05
415 Yellow Jacket.....7¼

AFTERNOON SESSION.

100 Challenge.....1.70
80 Caledonia.....90c
75 Exchequer.....2¼@2.60
50 Essex.....1.80
50 Golden Gate.....50c
190 Gould & Curry.....5¾@5¾
50 Hale & Nor.....5@5¼
150 Justice.....1.40@1¾
300 Julia.....1.35
100 Lady Wash.....55c
100 Leviathan.....30c
120 Mexican.....10¼
120 New York.....20c
165 N Bonanza.....25@20c
190 Ophir.....10¼@10¾
120 Overman.....1.30
95 Occidental.....2.60
30 Potosi.....3.70
200 Silver Hill.....60@65c
100 Savage.....4¼
370 Scorpion.....2¼@2.15
200 Sierra Nevada...16¾@15
200 Scorpion.....2.60@2¼
40 Utah.....10¼
360 Union Con.....25¼@25¾
55 Ward.....2@2¼
440 Yellow Jacket.....7¼@7¾

AFTERNOON SESSION.

200 Argenta.....55@50c
320 Addenda.....90c@85c
320 Albion.....80c
250 Atlas.....70c
100 Belding.....70c
140 Bodie.....8¾
70 Bechtel.....1¾
3350 Belmont.....40c
150 Boston.....1.15
120 Bulwer.....5¾
500 Belle Isle.....65c
100 Black Hawk.....70c
50 Booker.....45c
150 Belvidere.....3.45@3¼
125 Champion.....95c
300 Concordia.....1¼
40 Caledonia (B H).....2¼
30 C Pacific.....3¼
950 D Standard.....60c
150 Day.....85c
100 Eureka Con.....19¼@19¾
530 E M Diablo.....50@55c
400 Grand Prize.....85c
470 Goodshaw.....35@30c
100 Independence.....75c
120 Jupiter.....1¼
50 K K Con.....4
200 Metallic.....1.10
170 Mammoth.....2.45@2¼
600 Mt Potosi.....1.10@1
150 Mono.....71@67
150 May Belle.....20c
340 N Belle Is.....20c
600 Navajo.....45@40c
25 Northern Bella.....15
35 N Noonday.....7
150 Orient.....20c
140 Queen Bee.....50c
730 Red Cloud.....50c
50 South Standard.....10c
150 S Bodie.....25c
1050 S Bulwer.....90@75c
150 Summit.....1@1.10
50 Syndicate.....1.30
100 S Noonday.....1¾
300 Tiptop.....5
120 Tioga Con.....2
50 Essex.....1.90
365 Gould & Curry.....5¼
100 Golden Gate.....20c
80 Hale & Nor.....5
515 Justice.....1.65@1¾
50 Julia.....1.15
40 Lady Wash.....60c
50 Leviathan.....35c
500 Mackey.....10c
70 Mexican.....10¼
300 N Bonanza.....40c
85 Ophir.....10¼
175 Occidental.....1¾
60 Overman.....1.40
165 Potosi.....3.65@3.60
150 Savage.....4@3.95
370 Scorpion.....2¼@2.15
200 Sierra Nevada...16¾@15
200 Scorpion.....2¼@2¼
450 Silver Hill.....60c
70 Union.....24¼
60 Utah.....9¾@9¾
100 Ward.....2
70 Yellow Jacket.....7¼@7¾

AFTERNOON SESSION.

450 Alhion.....50@55c
320 Addenda.....80c
50 Argenta.....50c
50 Belle Isle.....50c
125 Black Hawk.....90c
300 Belmont.....40c
40 Caledonia (B H).....2¼
30 C Pacific.....3¼
100 Concordia.....1¼
50 Caledonia (B H).....2¼
100 C Pacific.....4
500 D Standard.....60c
450 Day.....90@85c
50 Dudley.....45c
100 Eureka Con.....19
150 E Mt Diahlo.....75c
50 Endowment.....25c
200 Goodshaw.....30c
200 Grand Prize.....70@75c
50 Gipsy Queen.....1.05
150 Jackson.....3¼
250 Mt Potosi.....1
75 Mouo.....5¾
40 Martin White.....85c
200 Mammoth.....2.35@2.40
180 Noonday.....4.15
100 Oro.....4¾

25 Syndicate.....1.30
100 S Noonday.....1¾
300 Tiptop.....5
120 Tioga Con.....2
100 University.....30c
270 Wales.....3

50 Phenix.....
120 Raymond & Ely...25@30c
650 S Bulwer.....55c
100 Tioga Con.....1.90
300 Tiptop.....5
400 University.....30c

Pacific Board—Latest Sales.

Wed'sday A.M., Apr. 21.

260 Alta.....3¼@3.20

AFTERNOON SESSION.

130 Alpha.....5¾
200 Bullion.....3.10
300 Best & Belcher.....11¾
730 Belcher.....2.95@2¾
280 Chollar.....4.85@4.95
1000 Con Imperial.....40c
130 Caledonia.....85c
110 Con Virginia.....3¼
320 California.....2.60@2.55
200 Exchequer.....2.95
290 Gould & Curry...5.55@5¾
200 Hale & Nor.....5@4.95
530 Julia.....1.30@1.35
450 Mexican.....10¼@10
100 Northern Belle.....13
130 Ophir.....10¼
100 Potosi.....3.65
80 S Nevada.....15¾@16
120 Savage.....4
60 Uteh.....9¼@10
60 Union Con.....24¼
220 Yellow Jacket.....7¼@7¾

AFTERNOON SESSION.

200 Argenta.....50c
150 Alhion.....50c
150 Belle Isle.....50c
200 Belcher.....2.90@2.95
150 Best & Belcher.....13
300 Silver Hill.....67@65c
20 Scorpion.....2.40
200 Wells-Fargo.....2c
120 Yellow Jacket.....7¼

California Board—Latest Sales.

Wed'sday A.M., Apr. 21.

4500 Wells-Fargo.....3¾@4c
20 Yellow Jacket.....7¼@7¾

AFTERNOON SESSION.

400 Atna.....5c
1000 Atlantic.....5@6c
600 Atlanta.....5c
30 Alte.....3@3.10
100 Andes.....97c
30 Belcher.....2¾@2.90
150 Best & Belcher.....13
85 Benton.....2.10
120 Bullion.....3.10
15 California.....2¼@2.70
250 Curtiss.....50c
75 Con Virginia.....3¼@3.35
1075 Con Imperial.....40@42c
500 Gould & Curry.....5¾@5¾
200 Gipsy Queen.....1.05
150 Hale & Nor.....5
150 Julia.....1.20
125 Justice.....1.95@1.85
50 Lady Wash.....52c
60 Mexican.....10¼@10¾
200 N Sierra Nev.....3c
20 Ophir.....10¾@10¾
120 Overman.....1.55
40 Potosi.....3.65
30 Sierra Nevada...15¾@15¾
75 Utah.....10
30 Union.....25@24¼

The Mining Bureau.

EDITORS PRESS:—There having been, first and last, more or less misapprehension concerning Assembly Bill 415, entitled "An Act to Establish and Maintain a Mining Bureau," it may be in place, now that the bill has received the approval of Gov. Perkins, for the undersigned to briefly outline what he intended should be the precise objects of that measure. The language of the bill, though much more lacking of comprehension than the New Constitution, is not all it ought to have been. Last week, when I saw that it was likely to become a part of the statutes, I left, in substance, the following memoranda with the Governor, with the request that he "take the bits in his teeth," so to speak, and carry out, during his administration, the practical intents of the law. First, select a person for State Mineralogist who had experience, common sense and scientific training equal to the practical wants of the people at large, and not the highly educated few. It has become a set phrase with too many, that is, "the mining countics," as if almost every county in California were not rich in mineral substances of great value. Where it is not gold, silver or quicksilver, it is coal, iron, tin, marble, borax, salt, soda, paint-stuffs, building-stones and the hundred and one substances that possess a commercial value and enter largely into the arts and manufactures. Yet where are there convenient records of their location and extent? Now, secondly, it is the object of the Bureau to obtain just such information through reports, maps and samples of the minerals themselves. There should be a geological or mineralogical map of every county in the State, showing all these things as plain as a guide-board. In the next place, a carefnl compilation of all that is good of the past history of mining in this great state into one handy volume, embodying all that is of practical use under the head of geology, followed by fresh and regular reports. The easiest part of the work will be to collect and classify the necessary rocks and ores for public exhibition and comparison. If this last were the total aim of the bureau, the name of museum would have constituted a better title, and the whole thing were a mistake. The plain title of the bill seemed to me to imply just what the people required—mining bureau; mining is a word every one has some practical conception of, while the word bureau is the most familiar of household words. "Handy as a pocket in a shirt," for old as well as young. Museum is a good enough word, but is too suggestive of stuffed owls, hermetically sealed glass cases with old fossils. What we want in a convenient or central portion of the metropolis, is a bureau of maps, reports, rocks and ores that every day people, prospectors and miners cannot only look at, but touch, taste and handle again and again. I hope you get my idea of it all, and will "stand by" and help the Governor and the Mineralogist whoever he may be) carry it ont. Of course, unless "stocks are up," the means will be scarcely snfficient to give the work a fair send off; but at worst, it is boped that there will be enough to soon create the nucleus of an institution, the State and city in a few years will be proud of. JOS. WASSON.

Mining Share Market.

The long-continued and unprecedented storm, which during the week has raged with so much severity, has blockaded all railroads and leveled the telegraphs so completely that the business of the market has been entirely local. Owing to the fact that no information could be obtained from the mines, there has been no ground on which to base operations; and as no outside orders could reach the brokers, there has been more positive dullness than was ever known before. The mines may have petered ont, or they may have opened into bonanzas of marvelous wealth, and while the facts were not known there, selling short or anticipating a rise might be ruinous to the speculator who should take the risk. It is the part of wisdom to stand still when an almost Egyptian darkness pervades the stock atmosphere; to advance or recede under such conditions would be extra-hazardous, if we may borrow a fire-insurance phrase. The wind, at this writing, has not changed, and the frequent showers here may be permanent rains in the interior, and be adding to the already fearful accounts of floods, snows and snowslides which reached us before the suspension of intercommunication. It would be gratifying to have this embargo upon information dispelled speedily, for the public have been so accustomed to learning the daily news of the world, that, now it is withheld, a news famine is nearly as disagreeable as a scant supply of food.

THE HOOVER TELEPHONE.—The telephone of this pattern which connects our editorial and compositing rooms continues to operate very satisfactorily. The distance is short, but it would evidently succeed at a much greater distance. Whether it would succeed with a mile of wire we do not know from experience. The statement made to that effect in last week's PRESS was given on the authority of the agents and we have data neither to doubt nor prove it.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

NEW VEIN.—Amador *Dispatch*, April 17: A rich vein of quartz, 2 or 3 ft wide, was struck at the Monterichard mine, a few days since, near the surface of the ground, and but a short distance from the original shaft.

THE Zelle mill has adopted the use of one of Knight's patent water wheels, and is now being run by water power instead of by steam.

AQUEDUCT CITY MINES.—The placer miners of this part of the county have not been doing much this past winter owing to the extreme cold weather, and a consequent lack of water. The Grass Valley mining company, superintended by Mr. L. McLaine, is doing a rushing business with two big hydraulic pipes, which are kept running day and night; and judging from the gold that one sees in walking over the bedrock of the claim, the company will make a fine clean-up some day. Mr. Wheeler, of Pine Grove, is also piping successfully, as is believed, on one of the best mines in Amador county, or any where else. Mr. Randell, of Pine Grove, is also operating on his old hydraulic claim, which prospects well. In fact there are more paying mines in this vicinity than can be supplied with water at present.

YELLOW JACKET.—Amador *Ledger*, April 17: Very gratifying reports reach us concerning this Drytown mine. The shaft is down 72 ft, with an ore body 5 ft in width, 7 ft of ledge matter between the walls. No drifts have been commenced as yet, and it is the intention to sink to the depth of 170 ft before drifting. A large quantity of rock, estimated at 140 tons, lies on the dump, which good judges say will average $15 or $16 per ton. Parcels of the rock, representing the average grade, have been worked by ordinary mill process, and surrendered at the rate of $16 per ton.

ORIGINAL AMADOR.—This prominent mine of Amador City has been brought almost to a standstill. The mill is idle, and the extraction of ore suspended. The owners have decided to confine operations to prospecting. Eight miners only are employed; 4 running a crosscut and 4 in the winze. The trouble with the mine has been the narrow ledge, and extremely hard rock, making it very expensive to work.

ZEILE.—The mill was started by water power for a short time on Saturday, but it was not until Tuesday the water-power machinery got fairly under way. It was then found, as Mr. Knight, the machinist, anticipated, that the power was equal to running the full 40 stamps of the mill, but that it was hardly capable of operating the rock crusher as well. To obviate this difficulty, a larger nozzle is deemed necessary, and will be ready in a day or so. There is only 150 ft fall for the water running the mill, and consequently it requires a large body of water to give the necessary power. It will tax the full capacity of the Moore ditch to supply this mill and the claims on Murphy's ridge.

MISCELLANEOUS.—The Gover mine, it is reported, is looking well—better rock and more of it. The North Gover company have again started drifting into their ground, from the 700-ft level of the Gover. The Keystone company has resolved to thoroughly repair their mill this summer, but that rumor of adding additional stamps is without foundation.

BUTTE.

OROVILLE BLACK SAND MILLS.—Butte *Record*, April 17: Major Frank McLaughlin, agent for Edison, and G. E. Carman, chemist, passed through Omaha Friday for Oroville, Cal., to receive bids and to make contracts for the construction of ore mills at that place for the Edison mining company, the owners of the Edison electro-chemical process of extracting gold from tailings. This process will be used in this mill, which is to be completed in August.

FRESNO.

SAMPSON FLAT MINES.—Cor. Fresno *Expositor*, April 21: These mines were discovered in January, but the matter was kept a profound secret by the discoverers until quite recently. Their object was to have ample time to discover and locate the best ledges before the excitement. Their success has been good. The leading claims are Big Sampson, owned by Little, McBee & Co.—this ledge is 8 ft wide, and assays $90 to $100 gold per ton; the North Star, owned by Fenwick, Rape, Converse & Lewis, assays from $150 to $200 per ton, and is 3 ft in width; the Monitor, owned by Davis, Lewis, Shannon and Case, is 5 ft wide, and gives an average assay of $1,200 per ton. They all are in slate formation, and carry free gold. This camp has the finest prospects for the future of any camp I was ever in, and our county should take the first steps to build a road here, via White Deer valley, to secure the trade of this district.

INYO.

CERRO GORDO.—Inyo *Independent:* An unusual number of mining men and speculators, from San Francisco and the East, are at present at Cerro Gordo. The outlook is flattering for the grand old district, the great and solid merits of which should have been recognized by capital long ago. Certain influences have been steadily at work for a long time to bring about this new state of affairs, and will prove successful in spite of opposition. Those who imagine that Cerro Gordo has seen its best days, or that its immense wealth has ever been half developed, are badly deceived and know very little of the facts.

MONO.

BENTON MINES.—*Bentonian*, April 17: The Diana mine is steadily improving in richness as depth is attained. Down 600 ft with a whim. Can't go much further with that power. Ledge fully 6 ft wide, and carrying no water. Numerous locations are being made. Looks as if our miners had confidence and were preparing for business in the near future.

LAUREL DISTRICT.—Mammoth City *Herald:* Jack Casey, who was in town last Monday, brings most encouraging news from this district, and shows a quantity of ore taken from a shaft only 16 or 18 ft deep, in which free gold in goodly quantities is seen, and also chlorides of silver. It was taken from the I X L mine, owned by Casey & McLain. The ledge is about 12 ft wide.

NEVADA.

WASHINGTON MINE.—Grass Valley *Union*, April 17: The shaft of the Washington quartz claim, situated in the valley northeast of the Idaho mine, is down 217 ft. It is 4½ by 11 ft and has 3 compartments. There is at present next to the hanging wall a 12-inch ledge of good quartz and a 6-inch streak of sulphureted ore. It is contemplated to sink the shaft 100 ft deeper, unless the increasing size of the vein should justify drifting sooner.

STORM.—This storm will be the means of greatly interfering with mining, as the ditches will be again filled with snow, and in quartz operations it will prevent hauling to custom mills, as well as the hauling of wood to the hoisting works that are short of fuel. There is satisfaction in knowing that an April snow cannot last long, as a freeze will not follow.

NEVADA M. CO.—The mine belonging to this company, the location of which is on Rich hill, opposite the site of the old Magenta hoisting works, is giving encouraging prospects. A prospect shaft was at first sunk upon the croppings, and afterward a tunnel run a distance of 200 ft to strike the ledge. From the tunnel drifts have run on the ledge, in all, a distance of 400 ft. The ledge is now from 18 to 24 inches in width, and shows well in free gold and sulphurets. There are about 150 ft of backs above the tunnel level, enough to afford work for some time to come without erecting machinery or sinking deeper.

ITEMS.—Nevada City *Herald*, April 17: Work has been resumed at the Manzanita mine. The company is now running a full head of water. The Live Yankee mine is still idle, owing to the wet weather. Another rich strike is reported at the Bald Mountain claim, near Forest City. The Blue Tent company is employing a full force of men, and running from 1,200 to 1,500 inches of water. Work at the Merrimac is progressing slowly; no new developments have been made. A number of mines have been idle on account of the late storm.

TEMPORARILY SUSPENDED.—*Transcript*, April 16: Prospecting has been temporarily suspended on the Wind-up drift claim, which is situated near Sargent & Jacobs', Quaker hill. A bedrock tunnel 876 ft in length has been run to date, and many believe that the gravel channel being sought would have been found within a short distance ahead. Some of the stockholders in the Wind-up express considerable dissatisfaction at the determination of the directors to quit work even for a short time.

ROUND MOUNTAIN MINE.—Since their last clean-up the Round Mountain boys have been working with renewed vigor in their promising drift mine, and are being rewarded by finding some good gravel. They are now engaged in passing through the old workings, and expect soon to get into entirely new ground where a bonanza is likely to be encountered.

PLACER.

MICHIGAN BLUFF.—Placer *Herald*, April 17: The mines are working, but on account of the ditch being broken in so many places have not done much washing yet, but it will be repaired, and all will be O K in a few days. The El Dorado Hill company is pushing ahead rapidly. The quartz mine owned by C. J. McCoon will have a mill in course of erection in 8 or 10 days. He has some very rich specimens of quartz taken out a few days since over the surface; he has a very good showing of the filthy lucer.

FRANKLIN.—Dutch Flat *Forum*, April 16: The Franklin mining company is making preparations for opening the James Teaff shaft. They propose sinking and drifting out from the shaft to prospect the ground. The pipe is being laid and machinery erected for carrying on the work.

THE mines at Hunt's hill, Elmore hill, Forest hill, Quaker hill, and in fact all the hills, are reported running with full heads of water.

THE Hollis mine cleaned up last Sunday. E. Miner, the Superintendent, reports a very successful run; about $3,000 was taken out. The prospects of the mine are claimed to be most flattering.

A FEW days since, a miner, at Remington hill, in attempting to move a boulder, discovered a bonanza. The rock was about 2 ft in dismeter and in attempting to turn it over it appeared to resist his efforts, so he picked up a sledge to break it. In examining the boulder for a favorable place to strike it, some gold on the surface attracted his attention, and on further examination it was found to be literally filled with gold, and worth several thousand dollars.

PLUMAS.

COMMENCED PIPING.—Plumas *National*, April 17: The Plumas water company started up their pipes at Gopher hill on Thursday, but have not got fairly to work yet. The water now comes from the lower ditches, the main supply at the lakes on Spanish peak being still in the embraces of Jack Frost. The company has made many additions and improvements to their mining machinery, and will tear the big banks all to pieces this summer.

THE miners in and about Meadow Valley and Spanish Ranch country have started the water through the sluices and are hard at work on the gravel banks.

SHASTA.

LOWER SODA SPRINGS.—Cor. Reading *Independent:* The miners are laughing all over, as they are having an abundance of water for mining purposes. Moss Clark exhibited a nugget that he picked up in his claim, weighing $27.50 gold weight. Clark says there are plenty more just like it, and he will commence cleaning up as soon as the weather settles. J. P. Williams & Co. are running a large self-shooter in the Dan Lace gulch, and are getting good prospects. There are several other mines on the creek, and the most of the miners expect to do well.

MR. LOUIS BLANDINO, of San Francisco, in company with Mr. Nichols and others visited several of the promising ledges in the county last week; among others, the Murray mine. Mr. B. expressed himself well pleased with the appearance of these ledges and the country generally, and thinks that Shasta county shows abundant evidences of mineral wealth.

TUOLUMNE.

EASTON M. CO.—Tuolumne *Independent*, April 17: This claim, at Arastraville, has a shaft down 100 ft, with two stopes—one of 50 ft, and the other of 30 ft—to uncover and learn the extent of the vein, which now stands out clear and defined, about 1 ft in width, and going wider and better as they go down. The rock shows well in sulphurets, while the free gold may be seen thick in almost any piece of rock that can be examined, and which, by actual crushing, pays $85 to the ton. About 45 or 50 tons are lying on the dump ready for crushing, while nearly 100 ft of backe staud uncovered and ready to be taken out; but little is seen doing there now, however, owing to the recent heavy rains. The only machinery used at present is a horse whim.

LOUISIANA.—This mine, near Summersville, after a period of inaction, has again started into active operation. The mine, we understand, was offered to a San Francisco company a few months since for $25,000, but that it was not accepted at the time cannot be but a matter of congratulation to the present owner, Mr. Lombarde, recent developments having justified his raising it to a much larger sum—$35,000, if I am correctly informed, cash. A new 8-stamp mill is in course of construction, which will soon be completed. The power to be used will be hydraulic, after the plan of the turbine wheel. As yet only 14 men are employed, but when the mill is in running order and the south shaft reopened, it will necessitate the employment of a much larger force. The rock, coming from a vein ranging in width from 1 ft upwards, is anticipated will pay $60 per ton, of which 250 tons are already on the dump, with plenty more ready to be taken out.

NEVADA.

WASHOE DISTRICT.

OUR WASHOE SUMMARY.—Owing to some unexplainable cause, we have not received our usual weekly summary, and are, therefore, compelled to go to press without it.

BRISTOL DISTRICT.

HILLSIDE.—Pioche *Record*, April 10: The water jacket of the Hillside company is nearing completion, the flue arrester and sheet-iron stack are already in position, and with the exception of some additional masonry work to be done, the furnace will be in readiness to start up in the course of the next two weeks, with over 40,000 bushels of coal and a large amount of ore on dump. At the mill site of the Bristol S. M. company work is being rapidly pushed ahead. A large amount of lumber and machinery are already on the ground, three new buildings have been erected, and also the large derrick in connection with the artesian boring apparatus. More prospecting is now being done around Bristol than at any period heretofore known in the history of the district; everybody seems to have the fever and the air is full of strikes, and rumors of strikes.

CHERRY CREEK DISTRICT.

SCARCITY OF MINERS.—Eureka *Sentinel*, April 14: A correspondent writes us from Cherry Creek as follows: Just at present there is a great scarcity of miners in this district. The Star company is in need of a few good miners, several of their best men having left to take contracts on the Silver Wreath and Lookout mines, in Ruby Hill mining district. Messrs. Woodruff & Enner have put on a stage line this week between Cherry Creek and Schellburn.

EUREKA DISTRICT.

EUREKA CON. DIVIDEND.—Eureka *Sentinel*, April 17: The dividend declared on the 15th, by the directors of the Eureka Con., for the past month, is 20 cents per share larger than the last. This one is 50 cents, which would seem to indicate that the directors have faith in the future earnings of the mine. Eureka Con. is about the healthiest mining proposition on the list.

WORK TO BE COMMENCED.—We learn that work will shortly be commenced on the Seventy-Six and Stella mines, in New York canyon. They were sold during the winter to Eastern parties. A private letter states that a representative of the company will put in an appearance at an early day to inaugurate operations for the season.

ESMERALDA DISTRICT.

REAL DEL MONTE.—*Herald*, April 17: Work at this mine for the past week has been progressing finely. The tanks were put in operation and the shaft below the stationary tank at the 500 level was cleared. Drifting on the 300 and 500 levels has been progressing rapidly, the face of each drift showing promising indications. The Ingersoll drills will be put at work to-night. Sinking in the shaft will be commenced as soon as the necessary timbers arrive.

THANKSGIVING MINE.—In crosscutting the ledge at a depth of about 90 ft, several tons of ore was taken out, assaying all the way from $15 to $187 per ton. The ledge from the foot to the hanging wall carries ore that will pay to mill. Both walls are perfect. For our own satisfaction a tape line was stretched across the ledge, and instead of 54 ft it marked 57 ft. This may sound rather loud, but those who have any doubts can easily satisfy them by measuring for themselves, as the mine is open to everybody.

GOOD HOPE DISTRICT.

GOOD HOPE.—*Times-Review*, April 8: About a ton of ore taken from the You & I mine at Good Hope, is to be sent here to-day or to-morrow, to be tested. We understand from Mr. L. I. Hogle that it is the richest lot ever mined in that district. Several tons of the same quality have been extracted, and are lying on the dump, awaiting transportation to either Cornucopia or this place. All of the miners who have been at work in the district during the past winter have done well, and it is believed by them that Good Hope will come to the front again during the next few months, and this time with well developed mines to back it.

I X L DISTRICT.

GOOD OAK.—Eureka *Sentinel*, April 14: It appears that ore of extraordinary high grade has been struck by the Bayfield company. The Bayfield had just received the results of 3 assays made by Mr. R. S. Day, of Oreana. The highest was $1,700 in silver and $3,300 in gold, making a total of $5,000 per ton.

MINERAL HILL DISTRICT.

CHANGE OF MANAGEMENT.—Eureka *Sentinel*, April 8: A transfer of the mill and mining property at Mineral Hill will be effected shortly. In fact, the deeds were expected by last night's mail. When all is satisfactorily arranged, there will be a boom in that quarter of Eureka county. The new company propose to work in a methodical manner, and will tolerate no "coyoting" or "ropherring." Unless there should be some change from the present programme, 30 or 40 men will find employment in the mines of Mineral Hill within the next 6 weeks, and it will be lasting work, as those interested in developing that particular district have a large capital to prospect with.

RAILROAD DISTRICT.

NEW HOISTING WORKS.—Elko *Independent*, April 15: The Enterprise mining company, of Railroad district, has ordered hoisting works from San Francisco, which will arrive immediately. The company also ordered to-day by telegraph a lot of flat cable from the East.

TYBO DISTRICT.

PROMISING.—Eureka *Sentinel*, April 14: A very promising mine is being developed by Lute Luce and associates, near the Two G, at Tybo. Hitherto the company has enjoyed a monopoly of all the best mines of the district. It now looks as though a paying proposition was coming to the front in the hands of outsiders. We hope the new find may prove an important one. There cannot be any too many mines and companies in the camp for the welfare of the people. The more the better in every case.

ARIZONA.

MULE PASS DISTRICT.—Tucson *Record*, April 14: D. B. Rea, Esq., has just returned from a three weeks' trip to the Mule Pass district. A New York party, who have valuable property there, propose commencing extensive operations immediately; they find fine bodies of copper ore and contemplate erecting furnaces. Geo. W. Atkins has run a cut across the Atlanta mine and is now 10 ft in carbonate lead ore, and has not yet reached the hanging wall. There is plenty of wood and water on the ground. Corbin & Co. are engaged in developing valuable property in this district and are sanguine of success. Mr. Rea also informs us that O. W. McCullough has discovered, in Ramsey canyon, Huachuca mountains, high grade carbonates of black sulphurets, which promise to assay high in silver; formation on the surface indicates an immense vein.

TOMBSTONE DISTRICT.—Hoisting works on the Empire mine were erected last February. They have a 10x12 double cylinder, portable engine, 2 reels and power sufficient to sink from 1,200 to 1,500 ft. These are on their new working shaft, which is down 100 ft, on which they are working 8 8-hour shifts. Are sinking to intersect the drift run from the 180 level of the old shaft. When this is completed, they will commence taking out ore preparatory to erecting a mill. The hoisting works have been running 4 months. Hoisting works are now in process of erection on the Grand Central, and machinery is expected here daily. These works will be a duplicate of those on the Empire. They have a large, well-developed vein with pay ore almost equal to the Contention. The next mine that will have hoisting works is the Gerard or Tough Nut Extension. Their machinery is on the ground, but no lumber is yet received. These works are the same as the Contention, first class machinery, lighter than that on the Grand Central and Empire. The Head Center, Sulphuret, Sunset and True Blue will probably erect hoisting works within a month or two. The Grand Central has surveyed a mill site immediately adjoining the Contention mill, Contention City. The Sunset and True Blue are also looking for suitable locality for mills.

COLORADO.

BRECKINRIDGE DISTRICT.—Cor. Georgetown *Miner*, April 16: Lots vary in price according to location. Some on Main street are valued at $5,000, while on Lincoln avenue they vary from $25 to $600, on Ridge street, $100 secures a very eligible location. In Lincoln City three smelters are in active operation most of the time. They are under the supervision of Gording & Co. One mile beyond Lincoln City is a 15-stamp mill running constantly. The ore they are treating comes from the Helen and Elephant mines, situated in that vicinity. It is a fact not to be disputed that Summit county has within her borders as good, if not better, mines than any other county in Colorado. When the snow leaves the hills, prospecting will commence in earnest, and the results that are sure to follow will make Breckinridge second to no other camp in the State.

MIDDLE PARK.—Mr. G. Smart, one of the contractors on the Wolverine mine passed this way a few days ago apparently well pleased with the looks of the future prospects of the Campbell district. Ten

A Study of Certain California Seeds.*

How Their Forms Aid in Spreading the Plants.

[By Robert E. C. Stearns, University of California.]

The present aspect of the fields in the immediate neighborhood, south of the grounds of the University of California, at Berkeley, when compared with their general appearance five years ago, when the flora of the locality was first noticed by me, exhibits a marked contrast; and though during this time the varying character of the vegetation from year to year attracted my attention, the altered physiognomy of the fields particularly impressed me this past season, and curiosity has led me to seek for the causes which have produced what may be regarded as a most striking change.

The complexity of questions of this kind is increased, not only through the simpler factors involved, some of which are given below, but by the sequence of relationship of such factors to each other, which it is difficult to detect.

The climatology of the seasons during which such changes have been progressing; the tillage of proximate lands, and the introduction of new plants, or of plants new to a locality, through this agency or by other artificial means more or less direct, which follow the settlement of a region; other changes which follow through neglect of tillage, as where the cultivation of farming lands is abandoned, as is generally the case where such lands are divided and cut into small parcels for village or town plats or lots; these are a few of the more conspicuous agencies which produce changes of the kind mentioned herein, in the local flora of such neighborhoods. Again, the time required for the growth of a plant, from the sprouting of the seed to maturity, differs greatly in different plants, and the seeds of some plants germinate in much less time than the seeds of others. From this cause the aspect of the fields changes during the same season; those plants whose seeds start quickly and attain maturity in the shortest time, dominate for awhile, and give one aspect to the fields in the first part of the season, and those plants whose seeds sprout slowly only reach maturity after the earlier have passed their prime or died, then dominate†, and later in the season give to the fields a different complexion or appearance.

The occurrence of these changes and the domination of this or that plant inside of or within the number of plants which form the flora of a certain region, may be conspicuously modified, in one year or season as compared with another, by the character of the season as previously referred to. As some plants thrive best with only a moderate supply of moisture, and are dwarfed, decreased in number of individuals or suppressed by the "drowning" of the seeds ae the farmers call it, through excess of "wet"—so the latter might be highly favorable to the germination of the seeds and earlier development of the plants of some other species, which in normal or ordinary seasons would appear much later.

The effect of only one such season might extend through several seasons, and materially modify the landscape features in its annual plants for a period of many years.

Without further enlarging in this direction on certain points which have been referred to, as they cannot properly be passed unnoticed, attention is called to another class of factors, not generally recognized, but of sufficient importance not to admit of exclusion, wherein natural selection is illustrated as performing its part in a different way.

The domination of "the fittest," the character of a season considered, has been inferentially if not directly shown, where the effect of an unusually wet season is referred to; so certain plants which now dominate in my immediate neighborhood illustrate how natural selection has assisted, to say the least, in producing the change in the open fields near my residence in Berkeley, through the advantage which one form of seed has over seeds of a different form. And this, aside from its interest to the scientific observer, is of special interest to the farmer, for it enters into the economics of his business, as may be seen further on.

Only a few years ago the entire region hereabout, from the hills to the shore of the bay, was either farmed or used for pasturage. Where not tilled, over large portions of this area, the wild mustard *(Brassica nigra)* abounded, and was regarded by the farmers as a pest; it grew and thrived nearly everywhere, and often attained a hight sufficient "to hide all of a standing horse but his head." During later years the mustard has surrendered a part of the field to an (introduced?) turnip and radish, plants of the same order, with smooth seeds, and all three of these have been giving way, gradually yielding to other plants, native and introduced.

The mustard may, in some localities, regain in part its lost supremacy, through the assistance of man, as the seed within a few years has become of economic importance, and is also on the list of products in the export trade of the State.*

The principal plants within the more limited area first mentioned in this paper, to which these smooth-seeded *Cruciferæ* have been gradually yielding, have seeds of a different form. One of these is the *Alfillarilla*, or "filaree," by which name it is more generally known, a plant which is closely related to the geraniums, if we may judge from analogies of form in leaf and flower, structure of seed receptacle and shape of seeds. This alfillarilla, as it is called by the Spanish Californians, is an *Erodium*, and two species grow here, namely, *E. cicutarium* and *E. moschatum.*†

This genus is a form of "craneshill," and as will be seen by Fig. 1, and its gynœcium, Fig. 2, is somewhat like that of *Geranium maculatum*, as figured in Gray.

The latter figure, with the sepals removed, shows the ovaries with their slender bearded‡ styles or awns (Figs. 3 and 4 enlarged) *in situ*, cohering to the elongated axis of the receptacle.

It will be observed upon examination that the ovaries are in fact a hard-shaped sheath enclosing the seed, the surface of which is covered with short stiff hairs or small bristle-like spines visible to the unaided eye, but of course more conspicuous through a common lens. The tip of the hard is also peculiarly pointed and curved; produced from the upper end of the ovary (that opposite to the tip) is a thread-like process or style an inch or more in length, varying in different specimens, so that the ovary as a whole may be compared to a tiny arrow, which it much resembles.

GYNŒCIUM AND SEEDS OF CRANE'S BILL (Erodium) OR ALFILLARILLA.

Now if we examine an unripe specimen before the sepals have separated from it (Fig. 1), we shall find four to five of these miniature arrows (carpels) side by side, closely fitting together, being snugly packed around the prolonged central axis of the gynœcium, the base of which is sufficiently expanded or swollen to receive the tips.

After the blossom has withered and the ripening process advances, it will be found that the arrows (ovaries) in these little bundles, or quivers, if it be allowable to so name them, exhibits a tendency to separate from the central stalk or axis of the receptacle, first curling upwards and finally falling off, or are blown out and distributed by the wind.

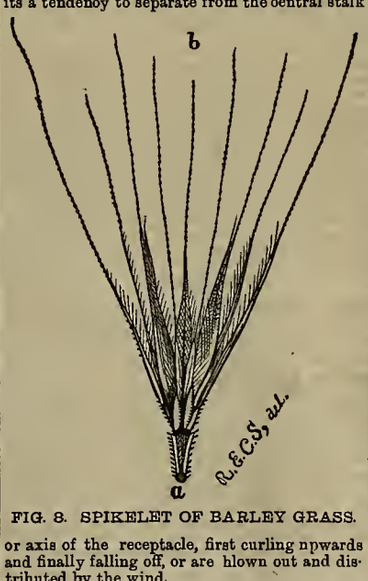

FIG. 8. SPIKELET OF BARLEY GRASS.

As soon as the ovaries are detached as above, their styles commence twisting (See Figs. 5, 6 and 7), and the delicate threads, as seen upon and along the slender shaft or style, are consequently thrown out at an increased angle (sometimes at a nearly right angle), so that the entire ovary now presents somewhat the appearances of the skeleton or frame, as it were, of a parachute, which after a breeze has passed and the air is calm, causes it to descend vertically, hard downward, so that the tip first touches the ground; the end of the tip is also barbed, so that if the soil at the spot where it slights is at all loose, it holds on. If the weather is dry the style or awn becomes still drier, which causes it to twist still more, and the torsion caused by increased desiccation, turns it deeper and deeper; while if the atmosphere becomes damp or rain occurs sufficient to moisten the slender style, though but little moisture is required to relax the torsion, the hits or grip previously made is not lost, because with the softening of the style the barb or ovary is not twisted out; whatever hold has been gained is retained, and the torsion renewed with recurring desiccation, and so the process of planting goes on.

The small bristles on the surface of the ovary or sheath are set obliquely upwards to the axial length and assist in the process of planting. It will be seen that every alternation of atmospheric conditions, characterized by positive moisture or dryness, assists in the operation.†

The luxuriant growth of the cultivated geraniums in California is well known. In and around Berkeley nearly every yard has many plants of one or more varieties. On my premises are numerous vigorous plants of large size and of many varieties, including Pelargoniums.

The question naturally occurred, why have not these ornamental forms which have the great advantage over their wild relatives of the protection and fostering care of man, spread like the unprotected *Erodium* and divided the field with it or driven it out? The seeds are not infertile, for under the shade of the sturdy plants which produce them, protected during the hot dry summers by the leaves which fall from the parent plant and make the thin mulch which covers them, with infrequent and slight sprinkling during the long rainless season, hundreds of young plants may be seen in the fall which have sprung from the loose and slightly moistened soil and acquired their second pair of leaves. The carpels are of the same form as those in *Erodium;* few persons could detect any difference, and the awn or style twists in the same way. Upon critical examination, however, it was found that the tip (insertion point) of the carpel was covered with *soft silken hairs instead of rigid bristles*, too soft to act as barbs, and the insertion point is neither as sharp or stiff nor curved the same as in Erodium.

The seeds of all these foreign forms which have been examined by me in this connection, are apparently dependent for distribution chiefly on the winds, for the delicate filaments along the style if not longer are more numerous than in Erodium, so that when the twist or torsion has occurred, they present a form well adapted for distribution by flight.

Darwin has noticed the advantage which winged seeds have in this respect, as well as those plants whose seed cups or receptacles have a rough exterior, which get caught in the hair or fleece of animals and are thereby transported from place to place. In this way also the seeds of the geraniums have some advantage, but as compared with those of Erodium, so far as planting by natural methods is considered, the advantage is conspicuously in favor of the latter.

I do not know how it is with the cultivated varieties referred to in their native country, neither can I assert how it might be with our Erodium forms if transplanted to another region; a different environment might induce a gradual modification in those peculiarities which in the environment of Berkeley are important factors in their propagation and the extension of their geographical domain. It is not difficult for a person who is familiar with the cultivation of plants, and who has had an experience covering widely separated regions with different soils and climates to conceive of conditions which might give to Erodium a rank, succulent and tender growth, which, continued for a few years, might differentiate the rigid bristles and barb of its ovaries in the direction of greater flexibility; or, on the other hand, to modify the soft nap or pile on the surface of the ovaries, as well as the flexible tip of the foreign geraniums in the direction of rigidity or spine-like stiffness. Those influences which induce succulent or ligneous tendencies in plants are to a great extent the factors in such variation.

The seeds of geraniums found in the highlands of Uruguay, as well as the seeds of certain other plants, exhibit the same interesting peculiarities.

Notwithstanding the browsing of cattle the Erodium gained upon the previously conspicuous forms. Within the past two years, however, it has been losing ground, in some places more rapidly than in others, through the conquering advance of another plant, a form which, being not only worthless as food but repugnant to cattle, is not molested by them in its onward march for supremacy, which over large areas it has already achieved, to the nearly total exclusion of Erodium.

This latter is what is known as barley-grass, or false barley, *Hordeum maritimum*, of which a spikelet is shown in the following Fig. 8.

Upon a careful examination it will be seen that the entire spikelet throughout is closely set either with short rigid bristles (as on the glumes and palea) or with minute sharply-pointed barbs as exhibited in the awns throughout their entire length, and on the edges of the arrow-shaped base or stem (insertion point) of the spikelet. Upon the long bristle-like awns these barbs are closely set, but are so very small as not to be at first detected; on pulling one of them through the fingers in a direction from the tip, *a*, towards the extremity of the awn, *b*, no difficulty is encountered, it may be done with ease; but on pulling it in the opposite direction, namely, from *b* towards *a*, resistance ensues from the multitude of minute barbs, and the effort, if persisted in, results in the breaking of the awn.

The spikelet as a whole may be regarded as a wonderfully ingenious, compound and effective barb, having through the angle of its various parts and the length of the awns, all of the advantages of the parachute form which Erodium and the cultivated geraniums referred to derive from their twisted styles with fine lateral hairs, for floating in the air *and for poise in ultimate descent.*

The principal advantage which Erodium has over this Hordeum is in the hygroscopic torsion of the styles* or awns; this is more than balanced by the preponderance of barbs and bristles in Hordeum, all of which are set at some angle outward and upward, while the spoon-shaped basal nib, arrow-head or insertion point, whichever it may be termed, is perhaps equally well adapted as the same part in the carpels of Erodium, for hiting and holding on; once inserted, every motion it receives, whether from the wind or other source only inserts it deeper and deeper, and in this the nib or insertion point is assisted by the other parts of the spikelet. Another and probably the chief advantage which the barley-grass has over Erodium is in the greater number of seeds (three in a spikelet) *"and 15 to 30 spikelets in a single head"* in a single plant; recurring again to the fact that cattle dislike it on account of its wiry, prickly character, which gives it almost perfect immunity or protection from their browsing, it is easy to perceive why it has become nearly if not "quite master of the situation."

To the farmer it is a pest and to the pedestrian a nuisance, as the spikelets stick into the trowsers around the foot, working in deeper and deeper with every motion, often crawling upwards as far as the top of the boot-leg, where if the stocking is long and extends above, it catches and follows down into the foot, irritating the flesh and compelling a halt in order to remove the annoyance.

Under a microscope lens the main barb (insertion point or nib) is an interesting and curious object; the unshaded edges (see figure) and the tiny barbs upon the same are translucent, being nearly pure silica; so also are the minute barbs upon the awns; and the short bristles on the surface of the ovaries in Erodium resemble, in miniature, the spiny bones in the dorsal fin of a perch.

Other bearded or barbed-seeded or rough-burred plants have increased in several places within the region referred to in this paper, among these are the burr-clover (*Medicago denticulata*) and the thistles (*Centaurea melitensis* L., and *C. solstialis* L.), both introduced species; the barley-grass, however, has the advantage over all others and is likely to maintain it.

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*This paper was first prepared for the *American Naturalist*, to which journal and to the author we are indebted for the permission to reproduce it at this time.—Editors Press.

†Thus *Madia sativa*, popularly or unpopularly known as "tar-weed," and obnoxious to pedestrians on account of its gummy exudation which injures clothing, though inconspicuous in early summer, later in the season becomes a prominent plant.

*In 1875, 1,013 centals, valued at $4,849; 1876, 5,458 centals, valued at $18,314; 1877, 5,065 centals, valued at $15,412; and in 1878, 7,552 centals, valued at $21,039, were exported to foreign countries, making a total for the four years of 19,088 centals of the value of $60,254.

†Cattle eat these readily and appear to be fond of them, but the latter species especially is not a desirable plant for milch cows, as it gives a disagreeable odor and taste to the milk.

‡It is presumable that the Spanish name *Alfillarilla* was suggested by these delicate filaments.

†This is easily illustrated by the following simple experiment: Take a tumbler and fill it with sand; select specimens of the gynœcia or receptacles which are beginning to turn brown or approaching ripeness, that is while the seeds complete with barb and shaft are straight; place the barb sufficiently deep into the sand so that its tip is fairly set; it will soon be noticed as the ripening progresses, as the awn or shaft begins to dry that it also begins to curl or twist, and that in curling it buries the barbed ovary deeper and deeper, as turning a corkscrew carries the same deeper and deeper into a cork.

*"A wild oat * * * * * the *A. sterilis* of botanists, is remarkable for the hygrometric properties of the seed. Two grains usually grow together, and they have a stout, bent and twisted awn. When the oat is ripe it falls out of its glume, and in warm, dry weather may be seen rolling and turning about on its long ungainly legs as they twist up in consequence of their hygrometric quality. They turn and tumble about till their awns are so twisted that they can twist no further. They then remain quiet till the dew falls, or they are moistened by a shower, when they rapidly untwist and run about as if anxious to escape from the wet."—*Baird's Dict. Nat. Hist., p. 27.*

Miners everywhere at work with a full supply of water—all they can conveniently handle. It now seems certain that the mining season will extend far into July and possibly to August.

One of those men who cheat others on mining shares and make their living by swindling, was shot dead in Leadville about a week ago. Death loves a mining shark.

Recent Decisions Relating to Patents, etc.

We give below brief abstracts of decisions* rendered upon patent cases in litigation, for the benefit of our readers:

ACTING COMMISSIONER'S DECISIONS.

Hedges vs. Daniels.—Padlocks.

Appeal from the Examiner of Interferences. Decided Jan. 5, 1880. Doolittle, Acting Commissioner:

1. Neither under the old rules nor now can the Examiner of Interferences dissolve an interference in view of *ex parte* affidavits setting forth public use of an invention as a bar to the application of contesting parties.

2. Rule 75 provides for the rejection of an application, by the Primary Examiner on the grounds of public use or sale, and permits him to consider affidavits or depositions supporting or traversing such an objection.

3 Rule 120 provides that, upon the attention of the Commissioner being called by the Examiner of Interferences, or the Examiners-in-Chief, to a statutory bar to the grant of a patent to either party, he may suspend the interference and remand the case to the Primary Examiner for the consideration of such objection.

The interference remains suspended until the *ex parte* question is decided. Motion denied.

COMMISSIONER'S DECISIONS.

Farmer vs. Brush.

Interference—Metal-coated carbons for electric lights. Decided Jan. 6, 1880. Paine, Commissioner:

1. A conception which is a mere abstraction, not connected with acts or words, is not the conception with which the law permits an inventor to connect his reduction to practice by proof of intermediate diligence, so as to carry back to it the date of his completed invention.

2. The race of diligence commences with the second conception and ends with the reduction to practice by the inventor first to conceive the device. Neither public use nor an application for a patent is necessary to the completion of the invention.

3. If the inventor first to conceive effects his reduction to practice before he files his application or introduces the invention to public use, the interval between the reduction to practice and the filing of the application, or the introduction of the device to public use, is not embraced in the period covered by the so-called race of diligence.

4. While lack of diligence in filing an application for a patent or in communicating the completed invention to the public may enter as a vital element into the question whether the completed invention has been abandoned or forgotten, it cannot operate *ex post facto* to undo the consummated work of completing the invention.

5. If an inventor abandons or forgets his invention before its public use, it may become the property of a subsequent inventor. Abandonment, in the sense in which the term is here used, is the cessation of all effort to confer upon the public the benefits of the invention. Such abandonment may be voluntary and absolute, as when the invention is deliberately thrown aside with a purpose never to resume it; but it may also occur when the invention is thrown aside, not with a purpose never to resume it, but without any purpose to resume it.

6. The question of abandonment is not one of mere mental operation. Proof of a mental purpose to give the public at some future time the benefit of the completed invention, unaccompanied by corresponding acts or words, will not necessarily overcome the presumption raised by acts of a party tending to show a purpose to abandon the invention.

7. A mere delay of two years in the application for a patent is not evidence of abandonment; but neglect to confer the benefits of the invention upon the public, whether it is or is not accompanied by neglect to apply for a patent, is evidence of abandonment.

8. An inventor may abandon or forget his invention, and then resume or recall it before another makes the invention; but his rights will not, in such case, relate back to his original invention so as to give him benefit of its date as against rival inventors.

On the ground of abandonment by Farmer, priority is awarded *pro forma* to Brush.

Hamilton vs. Kingsbury et. al.

U. S. Circuit Court, Northern District of New York. Decided Nov. 7, 1879. Blatchford, J.:

1. A license exclusive within a limited territory as to all the privileges secured by the patent, with the single reservation of a right in the grantor to *make* the invention, fails *pro tanto* to be a conveyance of the *exclusive* right within the meaning of the law of 1836, providing for the record of such conveyances in the Patent Office.

2. Not being *exclusive*, its record in the Patent Office is not such notice to purchasers that they can safely rely upon the record as showing the whole transaction between the parties to the instrument in respect to its subject-matter.

3. *Hence*, certain unrecorded written agreements contemporaneous with the license, and like it not necessary to be placed on record, were held binding upon the assignees of the license, although they were *bona fide* purchasers, without actual notice of any agreement between licenser and licensee other than the license itself.

The plea is overruled, with costs to the plaintiff to be fixed, with leave to the defendants to answer, or pay most of such costs within thirty days after service of a copy of the order to be rendered in this decision.

* More complete reports of the proceedings may be found on file in the office of the MINING AND SCIENTIFIC PRESS Patent Agency, 202 Sansome street.

MINING prospectors have begun to enter the Ute Reservation and already commenced to stake out placer claims and to put up ranches. It is feared that a conflict between the authorities and the prospectors will be inevitable, as Secretary Schurz declares that squatters will not be allowed to enter the reservation until the gentle Utes takes his *adios*, and that, if necessary, trespassers will be expelled by the U. S. troops. Mr. Schurz made similar threats when the miners penetrated the Black Hills, but they did not prevail against the hardy adventurers who went there in search of wealth and found it. They anticipated the Government then and they are likely to do it again. If Mr. Schurz wants to prevent trouble in the Ute country he had better hasten the departure of the Utes, so that the reservation may become public lands; if he does not, the miners will make short work of the Utes and their reservation.

POVERTY OF WEALTH-DISCOVERERS.—Marshall, the discoverer of gold in California, is in his old age, a pensioner on the bounty of the people of the State which to him more than anything else owes its greatness and prosperity. Comstock, the discoverer of the wonderful lode which bears his name, ended his life in poverty and privation in the wilds of Montana, and not even a simple headboard marks the last resting place of the man whose discovery has added so much to the wealth and luxury of the human race. Coltou, the discoverer of the "Bobtail" lode, in Colorado, which has yielded millions of dollars, is passing the evening of his days on a little ranch on the Platte, where he is barely able to make a living.

USEFUL INFORMATION.

Home-Made Soda Water.

The artificial seltzer water, made with a carbonic-acid generator, is already an imitation, far from perfect, of the natural water. A recipe to make it on the small scale for family use, as it were, can only give a product differing still more from that of the spring. Yet the following would fairly imitate the taste and properties of the natural water:

Fused chloride of calcium	4 grains
Chloride of magnesium	12 "
Chloride of sodium	15 "
Citrate of iron	½ "
Tartaric acid	2 drams
Bicarbonate of soda	2½ "
Water sufficient.	

Dissolve all the salts, except the tartaric acid and bicarbonate, in about one pint of water, and introduce the solution into a champagne bottle. Then, having completed the requisite quantity of liquid so as to leave an empty space of about two fluid ounces, add the tartaric acid, and, immediately after, the bicarbonate of soda. Cork the bottle tightly, secure the cork with stout cord, and set the bottle aside for about six hours before it is opened. It is then ready for use.

ROLLING AND POLISHING LEATHER.—A new form of rolling and polishing machine for leather has been designed by Mr. J. A. Brown of Exeter, England. In this arrangement a pendulum is used for carrying the polishing-roller. Instead of this roller being depressed to bring it to bear upon the work, which is placed upon a segment-shaped bed below it, the work is raised and maintained in contact with the swinging-roller, and dropped at pleasure out of contact with the same. The pendulum carrying this roller is pendent from an arched frame, and is actuated through its connection with a rotating crank. Below the roller is a segment-shaped bed, which is carried by an elastic table. Below this bed and connected therewith is an arrangement of knuckle-jointed or toggle-levers supported on the base of the machine. The straightening of these levers will lift the bed to its highest position. These levers are connected by a horizontal rod to a rocking-arm, on the axle of which is a treadle. By depressing this treadle, the axle will be rocked, and the rod which connects with the toggle-levers being thrust forward will cause the levers to raise the bed towards the swinging-roller. If, now, a butt of leather be laid upon the bed while depressed, and a reciprocating motion imparted to the pendulum, the attendant has merely to depress the treadle, and the leather will be brought up under the action of the reciprocating roller. The amount of pressure put by the attendant on the treadle will determine the degree of severity of the action of the roller upon the leather; and, by modifying this pressure to suit the work in hand, the amount of compression and the degree of polish imparted to the leather may be determined with great accuracy. Very nearly the same thing has been used in the Eastern States for half a century, designed especially for polishing marbled paper, etc.

BLACK DYE.—This is for either wool, hair, fur, or silk. Boil the articles for two hours in a decoction of nutgall, and afterwards keep them for two hours more in a bath composed of logwood and sulphate of iron; keep during the whole time at a scalding heat, but not boiling. During the operation they must frequently be exposed to the air. The common proportions are five parts of galls, five of sulphate of iron, and thirty of logwood for every hundred of cloth. Sometimes a little acetate of copper (verdigris) is added to improve the color. Woolen cloth, before it receives a black color, is usually dyed blue; this renders the color much fuller and finer than it otherwise would be. If the cloth is coarse, the blue dye may be too expensive; in that case, a brown color is given by means of walnut shells. Silk is dyed in the same manner as wool, except that as it imbibes a large quantity of tannin, the quantity of galls must be increased to twice as much, and the silk must remain longer in the solution.

FOR EBONIZING cherry wood, Brazil wood, powdered nutgall and alum are boiled in the water until a blackish color is obtained; the liquid is filtered and applied to the wood, which is then next washed in a liquor made by digesting strong vinegar and a little oil of vitriol for some time with excess of iron turnings; thoroughly wash the wood, dry and oil. For staining fine woods the following is applicable: 4 ounces of gall-nuts, 1 ounce powdered logwood, ½ ounce green vitriol, and ½ ounce verdigris are boiled with water, and the solution, filtered hot, is applied to the wood, which is then coated with a solution of 1 ounce fine iron filings dissolved by a digestion in a small quantity of hot wine vinegar.

NOVELTY IN CUTLERY.—Chester Brothers, of Sheffield, England, have brought out a novelty which, says *Martineau's Journal*, can be added to any kind of knife without making it larger. It appears like a "blade"—but it would be more accurately called a small tool capable of doing a variety of things. It does duty as a cartridge extractor, a pin-fire spanner, for screwing or unscrewing striker, nuts or nipples of guns, and a file, which may be used for cutting wire, particularly of champagne bottles.

REMEDY FOR THE RATTLING OF A HOT WATER BOILER.—When a coil is used in a stove instead of a waterback the diameter of the pipe should not exceed a certain proportion to its length, with the fewest possible turns, that the water as it warms can pass rapidly to the tank or boiler, and not be retained long enough in the coil to form steam or to get nearly as hot as it is possible, consequent with the pressure. Thus, short pipe, large diameter, with one bend, or water back with one certain, or if a chamber only, the water will take care of itself, according to gravity. Rattling will be sometimes caused in a very hot tank when the pressure is relieved by drawing, on the same principle as water below 212° boils in a partial vacuum.

STRAIGHTENING HARDENED STEEL.—In hardening and tempering tools they sometimes spring, to the great annoyance of the workman, and not seldom the tool is reheated and rehardened. In most cases this may be avoided. To straighten a piece of steel already heated and tempered, heat it lightly, not enough to draw the temper, and it may be straightened by blows from a hammer, if the character of the tool will admit of such treatment, or, as in case of a tap, it may be straightened by a heavy mallet on a hard wood block. Although the steel when cold would break like glass with this treatment, when slightly warmed it will yield to moderately heavy blows unbroken.

MALLEABLE BRONZE.—According to a recent German patent taken out by M. Dronier, malleable bronze may be obtained by the addition of a small quantity—from ½ to 2 per cent.—of mercury. It may be added to either of the metals of which the alloy is to consist (being poured into the fused metal and stirred with it); or it can be introduced along with the tin, or soon after it, into the copper bath.

TO DILUTE hay rum use dilute spirits instead of water. When water is used the combination assumes a milky-white appearance and is utterly devoid of the usual odor given out by good hay rum. This is due chiefly to the insolubility in water of the essential oils contained in the spirits. Bay rum, when applied moderately to the hair without reducing is not injurious.

TO REMOVE OLD PAINT.—Another way to soften paint is by heat from a hot iron, or alcohol or gas flame held near it, and then scrape it off with a suitable knife or chisel.

GOOD HEALTH.

Heart Disease.

When an individual is reported to have died of a "disease of the heart," we are in the habit of regarding it as an inevitable event, as something which could not have been foreseen or prevented, and it is too much the habit, when persons suddenly fall down dead, to report the "heart" as the cause; this silences all inquiry and investigation, and saves the trouble and inconvenience of a repulsive *post mortem*. A truer report would have a tendency to save many lives. It is through a report of "disease of the heart" that many an opium eater is let off into the grave, which covers at once his folly and his crime; the brandy drinker, too, quietly slides round the corner thus, and is heard of no more; in short, this "report" of "disease of the heart" is the mantle of charity which the politic coroner and the sympathetic physician throw around the grave of "genteel people."

At a late scientific congress, at Strasburg, it was reported that of 66 persons who had suddenly died, an immediate and faithful *post mortem* showed that only two persons had any heart affection whatever; one sudden death only, in 33, from disease of the heart. Nine out of the 66 died of apoplexy, one out of every seven; while 46, more than two out of three, died of lung affections; half of them of "congestion of the lungs"—that is, the lungs were so full of blood they could not work, there was not room for air enough to get in to support life.—*Hall's Journal of Health.*

How to Apply Fomentation.

Good Health says: "One of the best remedies known for bruises, sprains, boils, neuralgias, rheumatism, gout, colic, and a host of maladies we might name, is fomentation; but it must be applied thoroughly. The first thing requisite is a soft flannel of a sufficient size to well cover the part to which it is to be applied after being folded four thicknesses. Fold as to be applied, and then dip in very hot water, lifting it out by the corner and placing it in the middle of a towel. Roll up quickly lengthwise of the towel, and wring nearly as dry as possible by twisting the ends of the towel. In this way the fomentation can be wrung out much hotter than with the hands. Of course it will be too hot to apply to the bare flesh; but do not waste heat by letting it cool. Protect the skin by one or more thicknesses of flannel and apply at once, covering with another dry flannel. The fomentation will gradually warm through, and will retain its heat two or three times as long as when applied in the ordinary way.

"When heat is required a long time, a bag of hot meal, hot salt, or sand, a hot brick or bottle, or, best of all, a rubber bag filled with hot water may be used, being covered with moist flannel when moist heat is necessary. When a fomentation is wanted quickly, it may be prepared in half a minute by wringing a flannel nearly dry out of cold water and wrapping it around the stove-pipe, or holding it against the side of the stove. If the stove has been recently blacked a thickness of newspaper should be placed between the wet flannel and the hot surface to keep the flannel clean.

"Poultices usually act essentially the same as fomentations, being most useful where moisture and heat are needed for some hours, as in the case of boils and felons. The ordinary way of applying is troublesome and inconvenient. Here is a much neater way: Make a little bag of proper size to cover the part to which the poultice is to be applied, of some kind of loose material, as slazy muslin. Put the poultice in this, not waiting for it to cool. To prevent burning, when first applied, place one or two thicknesses of flannel between the bag and the skin. Cover all with a dry cloth or piece of oil-silk."

Sleeping Together.

If a man were to see a quarter of an inch of worm put in his cup of coffee, he could not drink it, because he knows that the whole cup would be impregnated. If a very small amount of some virulent poison be introduced into a glass of water, the drinking of it might not produce instant death, but that would not prove that it was not hurtful, only that there was not enough of it to cause a destructive result immediately.

We sicken at the thought of taking the breath of another the moment it leaves the mouth, but that breath mingles with the air about the bed, in which two persons lay; and it is rebreathed, but not the less offensive is it in reality, on account of the dilution, except that it is not taken in its concentrated form, but each breath makes it more concentrated. One sleeper corrupts the atmosphere of the room by his own breathing, but when two persons are breathing at the same time, 12 or 14 times in each minute, extracting each minute all the nutriment in a gallon of air, the deterioration must be rapid indeed, especially in a small and close room. A canary bird hung up over a curtained bedstead where two persons are sleeping will die before morning.—*Hall's Journal of Health.*

PRESSURE OF THE BRAIN.—An American medical man was called one day to see a youth aged 18, who had been struck down insensible by the kick of a horse. There was a depressed fracture of the skull, back of left temple. The skull was trephined and the loose fragments of bone that pressed upon the brain were removed, whereupon the patient came to his senses. The doctor thought it a good opportunity to make an experiment, as there was a hole in the skull through which he could easily make pressure upon the brain. He asked the boy a question, and before there was time to answer it he pressed firmly with his finger upon the exposed brain. As long as the pressure was kept up the boy was mute, but the instant it was removed he made a reply, never suspecting that he had not answered at once. The experiment was repeated several times with precisely the same result, the boy's thoughts being stopped and started again on each occasion as easily and certainly as the engineer stops and starts his locomotive.—*Popular Science Monthly.*

OAT MEAL FOR BREAKFAST.—In the last five years the consumption of oat meal, in this country, has probably increased 20-fold. People differ so much in their likes and dislikes that we do not insist on anybody eating oat meal because somebody else does, but the great growth of its popularity is beyond doubt. Generally the Irish and Scotch meal have been considered best, but they sell comparatively high, and persons well acquainted with the subject say that Akron meal of Ohio is just as good. Oat meal should be well cooked. As it is usually made a breakfast dish, it may be soaked over night, and then boiled like mush for say half an hour, while the other part of the breakfast is getting ready. No doubt it is more wholesome eaten plain, but the temptation to use various "dressings"—generally cream and sugar—is too strong for any except very firm health-seekers. But where these are eaten it should be, as the friends say, "in moderation."

FATAL EFFECTS OF FOGS.—A single week of raw and densely foggy weather more than doubled the death rate of London, compared with the average for the corresponding week for the preceding years. The weekly reports of the Register-General show that the annual death rate had risen steadily during the three weeks preceding the foggy period from 24.6 per 1,000 to 27.1 and 31.3; then it bounded to 48.1, a rate higher than had been recorded since the cholera epidemics of 1849, 1854 and 1866. While the increase in deaths in the West End districts of the metropolis did not exceed 32%, in the crowded quarters at the east end it was equal to 83%. The largest number occurred among people past 60 years.

COFFEE IN TYPHOID FEVER.—Dr. Guilessee, of the French Navy, reports that, in the early stage of the disease, coffee is almost a specific against typhoid fever. He gives to adults two or three tablespoonfuls of strong black coffee every two hours, alternating with one or two teaspoonfuls of claret or Burgundy wine. The beneficial effect is immediate. A little lemonade or citrate of magnesia should be given daily, and after a while quinine.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, April 24, 1880.

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The Week.

The week bas besn characterized hy the ssverest and most widesprsad storm of the season. A great deal of damage has besn done in the agricultural regions in some parts of tbe State. Some injury has been done also in the mining regions from slides, where the banks have come down and covered np the pipes, etc. In many places in tbe hydraulic mines, however, these big slides will in the end he hetter for tbe miners, since the breaking np of the masses of gravel by the rains will ohviate the necessity of nsing powder. The heavy hanke of snow in the monntains will insnre a first-class mining eeason, eince there will be plenty of water all anmmer. The storm has heen very widespread.

The Legislatnre adjonrned at the close of last week, and we give, in another column, the concluding husiness of the session.

The etorm bas heen eo severe tbat there has heen little traffic on the roads. Bullion ehipments from the minee have, therefore, not heen made to any extent.

MINES IN WISCONSIN.—We see hy the dispatches that the news from Ashland, Wis., is to the effect that the gold and silver minee discovered in that vicinity a few months ago are now heing worked by Hugh McDongall and others, of Chicago, as eecretly as possihle, and are panning ont beyond all expectations. There is great excitement over tbe epecimens forwarded to Chicago.

A TERRIBLE burricane occurred in Miseouri on Monday. The town of Marshfield was hlown down, and the ruins catching fire, some 40 or 50 pereone were killed. The towne of Granby, Warrensburg and Cnha were also seriously damaged.

PART of the lattice work of the Tay hridge has been recovered. It bears marks tending to enstain the theory of Sir Francis Bonch, chief engineer and projector of the bridge, that the train went off the track hefore the bridge fell.

Better Than Bonanzas.

Now, wben the Comstock is at sncb low ebb and the great minss of Colorado are proving so short-lived, is a good time to call the attsntion of monied msn, hoth at home and ahroad, to certain of the nsglected gold deposits of California, which, if they should not yield for the first year or two as do these evanescent bonanzas, possess at least the quality of endurauce—deposits that, while they may not, like these great propsrties, speedily enrich the first, will he less apt to impeverish the second set of investors. We allude here to the hydraulic tailings that at a few poiuts have accumulatsd nnder conditions favorable for a sscond handling, and to ths auriferous flats that have not yet been worked ont, owing to the difficulty of effectiug tbeir thorongh drainage. The debris from the hydraulic mines of California has either been carried down into the larger rivers and swept away, or it has made lodgmsnt in and along the heds of the streams up nsarer the mines. Only a small portion of thsse deposits can, however, he rewashed to advantage owing to thsre heing insufficient fall imsdiately helow them to admit of their bsing run off. In the few localities whers tbere is fall enough for this pnrpose, they can he utilized with profit, the business having paid wsll wherever undertaksn; strangs to say, however, some of these localities, few as they are, still remain neglected. In one case at least, the hed of the npper Bear river, this nsglect has been due to the heavy expenditure needed for preliminary preparations, though there is little doubt hut the amount of monsy so required would in the snd prove a good investment. However that might he, there certainly are several othsr points where an entsrprise of this kind could bs inaugurated and in a very short time made to return unintermitting and, so to speak, endless profits, one of these hsing Shirttail canyon in Placsr, and anothsr Slate creek in Sierra connty, at neither of which would any large sum be required to effect a successful movemsnt of thsir contents.

While the mors availahle tailing deposits of California are so limited in number, the other class of gold-containing deposits mentionsd—ths undrained flats—are hy no msans numsrous, the most noted as well as the largest and richest of these being tbe extensive deprssion situate nsar the center of Trinity county and known as Weaver hasin, some of the leading features of which, togethsr with a project designed to sffsct its partial drainage, wsrs outlined in these columns a few months ago, recurrence to the snhject heing now had hecause tbat entsrprise has since hesn so advancsd through the acquisition of additional mining ground and water rigbts and a further perfection of working arrangemsnts, as to greatly increase its chances of ultimate success, some minor engineering difficnlties that prssented thsmselves at the start having in the interim hssn effectually disposed of.

Weaver hasin, which contains ahout 12,000 acres of deep placsrs, is completely encircled hy rugged hills and lofty monntains, all auriferous, has in times past yieldsd enormous quantities of gold dust, having been one of the most prolific spots in the Stats. Under active gravel washing for ovsr thirty years, the tailings have eo accumnlated in and along Wsaver creek, the only outlet to this hasin, that hydraulic operations on a large scale can no longer be prosecuted thsre to advantags, even hand sluicing heing much impeded for want of fall. Anticipating these troublss, a capacions flume was ssveral years since commenced and gradnally extended down this creek in the expectation that it wonld effect a riddance of this ohetructing material and prove at the same time remunerative ae a gold-eaving apparatue. Bnt while securing to eome extent tbe latter ohject, thie flnme failed to afford any appreciahle relief against the principal trouhle; the sediment, for want of fall, conetantly choking it up at its lower end.

In this emergency Wm. S. Lowden, a pioneer settler iu Trinity county, devised a plan for accomplishing hoth these ends by means of a deep drain tunnel to he started from a point on Weaver creek a few miles below the hasin and extended thence west to Trinity river. This tunnel completed, the rich tailinge that have gathered in this locality could he rnn off and relieved of their gold as well also as a stratum of enrface gravel nearly 200 feet thick, the whole of which wonld yield immensely under hydranlic washing. Mr. Lowden, wbo has resided in Weaver hasin for 30 years, occnpying mnch of the time tbe position of connty enrveyor, and laterly aleo that of United States depnty mineral enrveyor, has epent much time in originating this echeme and perfecting its details, having also expended a good deal of money in secnring such tracts of mineral lands, rights of way, water franchisee, etc., as were indispensable to its economical execution and financial succees, the whole heing now in a condition to invite the inepection of capitaliets, to whose favorable notice enterprises of this cbaracter strongly commend themeelves.

A HEAVY snowelide occurred a few days ago at Mineral King district, where the boarding house of the employeee of the Empire mine was crushed in. None were killed bnt several were iujured.

Close of the Legislative Session.

The session of the Legislature of California closed last week. Before adjonrument, the Brannhart mining bill, to which we have several times referred, was defeated.

The Felton hill, for the protection of stockbolders in mines, was passed. Its provisions are as follows:

SEC. 1. It shall he tbe dnty of the secretary of every corporation formed undsr the laws of tbis State for the purpose of mining, to keep a complete sst of books, showing all recsipts and expenditures of such corporation, tbe sources of such receipts and the object of sncb expsnditures, and also all transfers of stock. All books and papers shall at all times during husiness hours hs opsn to tbe inspection of any houa fide stockholder; and if any stockholder shall at any time so reqnest, it shall he the dnty of the secretary to attend at the office of said company at least one honr in the day ont of regular bnsiness hours, and exhibit such books and papers of ths company as such stockholder may desire, who shall be entitled to he accompanied by an expert; and he shall also be entitled to make copies or extracts from any snch books or papers. It shall bs the dnty of the directors on the first Monday of each and every month, to cause to bs made an itemizsd account or balaucs sheet for the previons month, embraciug a fnll and complete statement of all disbursements and recsipts, showing from what sources sncb receipts were derived, and for what and to whom snch dishursemsnts or payments were made, and for what object or purpose the same were made; also, all indebtednsss or liahilities incnrred or existiug at the tims, and for what the same were incurred, and the halancs of money, if any, on hand. Such account or balance sheet sball be verified under oath hy the presidsnt and sccretary, and posted in some cuspicuous plac in the office of the company. It shall he the duty of the supsrintendent, on the first Monday of each month, to file with the secretary an itemized account, verified under oath, showing the nnmbsr of men employed under him, and for what purposs, and the rate of wagss paid to each one. He shall attach to such account a full and complete report, nnder oath, of the work done in said mine, the amount of ore extracted, and from what part of the mine taken, ths amount sent to mill for redncticn, its assay value, the amount of hullion rscsived, the amount of hullion shipped to the office of the company or elsewbsre, and the amount, if any, rstained by the superintendsnt. It shall also hs his duty to forward to the office of the company a full rsport, under oath, of all discovsries of ores or miusral-hearing quartz made in said mins, whether hy horing, drifting, sinking, or otherwise, together with tbe assay valus thsreof. All accounts, rsports and correspondencs from the snperintendent shall be kept in some conspicuons place in the office of said company, and hs open to the inspsction of all stockholders.

SEC. 2. Any bona fide stockholder of a corporation formsd nnder the laws of this State for the purpose of mining, shall bs entitled to visit, accompanied hy his expert, and examine the mine or mines owned hy such corporation, and every part thereof, at any time he may see fit to make snch visit and examination; and when sncb stookholder sball make application to the president of such corporation, he shall immediatsly cause the sscretary thereof to deliver to sncb applicant an order, nnder the seal of the corporation, directed to the superintendent, commanding him to ehow aud exhibit such parte of said mine or mines as the party named in said order may desire to visit and examiue. It ehall he the duty of the superintendent, on receiving snch order, to furnish such etockholder every facility for making a fnll and complete inspection of said mine or mines, and of the workings therein. It ehall he his duty also to accompany said stookholder, either in pereon, or to furnish some person familiar with said mine or minee to accompany him in his visit to and through each mine or mines, and every part thereof. In case of the failnre or refusal of the superintendent to ohey such order, such stockholder ehall be entitled to recover in any conrt of competent jurisdiction against such corporation the enm of $1,000, and traveling expenees to and from said mine as liqnidated damages, together with costs of euit. In case of euch refusal it ehall he the dnty of the directors of sncb corporation forthwith to remove the officer so refnsing, and thereafter he ehall not be employed directly or indirectly hy ench corporation, and no salary shall he paid to him.

SEC. 3. In case of the refnsal or neglect of the president to canee to be issued by the eecretary the order in the eecond eection of this act mentioned, such etockholder shall he entitled to recover against said president the sum of $1,000 and costs, as provided in the last eection. In case of the failure of the directore to have the reports and accounts current made and posted as in the first eection of this act provided, they shall be liable, either eeverally or jointly, to an action hy any stockholder in any court of competent jnrisdiction complaining thereof, and on proof of euch refusal or failnre, eucb complaining etockholder ehall recover jndgment for $1,000 liquidated damages, witb coeta of snit.

SEC. 4. All acts and parts of acts so far as they do conflict witb this act are hereby repealed.

SEC. 5. This act sball take effect from and after its passage.

The debris bill, which finally passed botb houses, is still in the hands of the Governor, not yet having hesn signed.

Land Slides in the Hydraulic Mines of Placer County.

The storm last week was very destructive in its effects in some of tbe hig gravel mines. Land slides were very numsrous and cansed more damage tban usual. On the Forest Hill divide, several are reported.

On the eveuing of the 14th instant a slide occurred in the Dardanelles mine. Ahont ten days previous, in tbe same mine, a slide, sstimated to contain 200,000 cubic yards of earth coming from the face of a hank 400 feet higb, had destroyed ahont 500 feet of 22-inch pipe and hnried one of the giants. The slide mentioned ahove passed over the surface of this one, choked up one of the outlet tunnels, dsstroyed 200 fset of pips and demolished the lodging house which stood 700 fest from tbe original face of the bank. Soms of the men harely made thsir escaps hefore the honse was struck. But little delay in working the mine will be caused hy the slides.

The most destructive slide on the Divide was the hreaking away of ths hank in the claim of Harry Adams, ahout three miles from Forsst Hill, on tbe 12th instant. About 500,000 cubic yards of earth hroke from the facs of a hank 300 feet high, destroyed ths giant and considerahle 15-inch pipe, and as it swept down the canyon carried away and wrecked six undercnrrents and the hlacksmith shop. This mine was just ready to clean up and all the gold is lost, temporarily at least, hy the destruction of slnices and undercurrents.

Bruce & Wheeler's claim also had its slide, which filled np the olaim to the rim rock. Thsir ditch is also somswhat iujured.

Sseveral othsr minor slides have occurred, aud the hanks are in such condition tbat othsrs are liable to come at any time. Though the season's work will bs mors or lsss retarded, the brsaking np of the immsnss masses of harren oemeut and volcanic detritus which overlie the pay gravel will result in a considerahle saving to the miners.

Worthless Mines.

During ths prssent mining "boom" througbout the couutry there is no donht that a grsat many worthlsss properties will he foisted into the market. People at a distance from the properties offered should exercise grsat care in their choice, and use every prscantion possihls. It is tbe duty of tbs press to expose any scbsmes wbich they know are had onss. The Nevada *Transcript* has the following to say of propsrty now hsing offered for sale in New York:

"The Gold Bar M. Co. has hsen organizsd in New York to work the old Irousidss mine in Jim Crow canyon, Sisrra county. R. G. Bloss is annonncsd as the President. The "prospectus" issued hy the organizatiou contains one clause to the effect that ths Ironsides is as valnahle a property as the famous Sierra Bnttes mins, which is said to he in that vicinity. A statement ahounding in audaciously falss descriptions of the mine and ths present condition of its abandoned workings, would he stamped hy most people who are posted as a clear case of "expert taffy." The Ironsidee is a pretty good piece of mining property, hut the parties engaged in placing it ou the market are, we helieve, laying themselves liahle to the imputation of drawing too long a how. To make a long matter short, it may he well to state that in the *Transcript's* opinion the prospectue of the Gold Bar company ie calculated to help dispose of etock rather than to give a fair idea of the eubject treated. We hope our Eastern exchanges, snch as the New York *Tribune, Mail, World, Mining News*, also the Boston and Philadelphia papers interested in the euhject of legitimate mining, legitimately conducted, will give us the benefit of their assistance in hringing thie case hefore the public. It is high time that attempte to mislead the Eastern puhlic with exaggerations he stopped, and we propose to see that they are so far as Nevada and Sierra counties are concerned."

THE suit hetween the Dardanelles and Mayflower mining companies is on trial for the third time in the Snperior Court of Placer connty, hefore Jndge Williams, of El Dorado. Whichever wins, it is probahle that the Supreme Court will he called on to adjudicate the case.

JUDGE C. C. GOODWIN, who has for a long time had the editorial management of the Virginia *Enterprise*, contemplatee retiring from journalism and entering the husinese of mining.

IN 1878 a nngget was found within six miles of Helena, Montana Territory, valned at $1,146.80. They have heen found in Montana of as high a valne as $3,200.

Mining in Utah.

Commencement of the Business.

[Written for the PRESS.]

Mining in Utah continues to move on in a quiet sort of way, not having experienced the "boom" that is said to have visited her neighbors on the south and east, and appears to even be threatening those on the north. We look, however, for such animation here as may possibly grow into a genuine excitement the coming summer. But whether shall happen or not, the business is bound to grow and prosper, notwithstanding it has, because of the low prices of lead and other extraneous causes, been a little depressed for the past three or four years. Utah may not come up at a bound with a clang and a hurrah, but she will come up steadily, sturdily and to stay, for she has the bottom facts on which to build up this industry. While it is nearly 17 years since mining for the precious metals was first commenced in this Territory, it is only about 10 or 12 years since much capital came to its aid and the business began to be carried on with anything like intelligence and system. Not, in fact, until the transcontinental railroads were finished were the conditions here such that vein mining could be prosecuted to advantage. With the completion of these roads freights were for the first time so cheapened that machinery, tools and supplies could be brought in and ores, lead and base bullion be shipped out of the country at a moderate cost.

As the Mormon hierarchy not only restrained their own people from hunting after gold and silver, but did all they could to prevent others from engaging in the business, it would probably have been a long time before this branch of mining obtained much of a foothold in Utah had it not been that a class of men were introduced into the country whom Church authorities could not terrify and dared not molest. In the fall of 1862, the California Volunteers under General Conner arrived at Salt Lake City and founded near it the military post, Camp Douglas. As the command contained many men accustomed to prospecting and mining, these naturally enough took to the business as soon as they had opportunity to do so. Within a year they had found the placers along Bingham canyon and, when in 1864 a company of these volunteers came to be stationed in Rush valley, 40 miles west of this place, they were not long in finding the silver-lead bearing veins that abound in that neighborhood; and, when a year or two afterwards these troops were finally mustered out of service, the most of them turned their attention wholly to mining, insuring for it a more rapid growth from that date onward.

Meantime, a portion of the overland emigration having stopped here, and some prospectors come in from other quarters, a few of the Mormons having also began to pay attention to mining, prospecting spread and the business grew apace. Explorations were extended over much of the northern and central portions of the Territory, and in the course of the next three or four years many districts had been laid out and hundreds of claims taken up.

Working the Ores.

The earliest attempts at ore reduction in Utah were made by Gen. Conner, in 1864, at the town of Stockton, Rush Valley district, where a smelting furnace was erected for the purpose. A number of additional furnaces were put up both here and at other localities within the following two years. The most of them, however, resulted in failure, while none reached any large or permanent success. The majority of these structures were built of unsuitable materials, besides being defective in form or otherwise faulty in the first place. Then, the parties entrusted with the business of running them lacked the requisite experience, the cost of labor and supplies was great, and there were no facilities for shipping the more bulky products of the mines to market. Being built of adobe and sandstone these furnaces soon burned out, and becoming useless were abandoned. Hence, the many dilapidated and deserted establishments of the kind met with in this part of Utah. All through the older smelting districts the traveler notices these ruins, and, if a stranger, wonders how it is that such extensive and costly works should have fallen into disuse and been suffered to go to decay in a country so young.

In the single item of high prices alone, sufficient cause for so much failure can be found. Freights on everything brought into the country, whether from the east or the west, averaged at that day about 25 cents per pound, while the discharged troops and others who had received money in currency had to submit to a fearful discount where payment was required in gold. Labor was also expensive—for the Mormons, while willing, and even compelled, to work for their own people at $1.50 per day, exacted two or three times that amount when they worked for others, being reluctant to labor for Gentiles even at these enhanced wages. Most of the teaming was also in the hands of the "Saints," who took good care to charge well for their services when required by these unwelcome and godless strangers. Under such exorbitant charges, it was clearly impossible for mining to succeed, to say nothing of the innumerable drawbacks arising from inexperience, absence of suitable material, etc.

Having partially surmounted these various difficulties, and gotten fairly underway, mining in the Territory experienced other troubles, which, though not peculiar to the country, proved exceedingly detrimental to the business. Mines that had been abandoned, on promising to become of value were reclaimed by the first locators, giving rise to much costly and vexatious litigation, it sometimes happening that when one set of claimants had been settled with and gotten out of the way, another set would arise to harass the parties defendant. Then came the failure of the several foreign companies—mostly English—who, after investing heavily in the Territory, came out nearly all losers. The fact that these mishaps were mainly due to bad management, did not avail to save the mines of Utah from being greatly disparaged through their occurrence, very little outside capital having been invested in the Territory for several years thereafter. But, despite these disasters and consequent forfeiture of confidence on the part of people abroad, mining interests here have been pretty well prospered, and are to-day in an exceptionally healthy condition, there being in this Territory as many paying properties, in proportion to the population engaged in mining, as in any country west of the Missouri river; and while losses have here occurred in the business, they have mostly fallen on large companies, and not often on the poorer classes of the community. The assessment system, as practiced in California and Nevada, has never much obtained in Utah. The mines here, with the exception of a few large enterprises, have been mostly self-supporting from the start, superseding the necessity for taxing owners and shareholders for outfitting and opening them up. We can point here, to not only a good many paying, but also to some largely productive mines—there being several in the Territory—that turn out from half a million to one and a half million dollars per annum, fully 40% of which has consisted of net profits. Heading the list of

The Leading Mines in Utah

Is the Ontario, which to date has produced nearly $6,000,000, of which $2,700,000 have been disbursed to the shareholders in dividends. The mine is well opened, splendidly equipped, and so far from being exhausted is hardly more than thoroughly prospected, and has no doubt a long and prosperous life before it. Ranking next to the Ontario is the Horn Silver mine in the San Francisco district, followed by the Mammoth in the Tintic district, both making large and profitable production, which they will doubtless be able to maintain for a long time to come. Down in the southwestern corner of the Territory are located the Stormont, the Leede, the Christy and the Barbee mines, all young enterprises, but containing the elements of a large success, having produced over $1,000,000 last year. The Telegraph, now owned by a French company, though considered an old mine for this country, is far from being a superannuated concern. It may even be questioned whether it has yet seen its best days, the remaining ore deposits in the mine being large, and the reduction works appurtenant to the property amongst the most extensive and well appointed in the Territory. This mine is situated in the West mountain, better known as

The Bingham Canyon District,

And is surrounded by a number of valuable properties, some of them carrying, like this, smelting ores only, while others contain both milling and smelting, or exclusively free gold-bearing ores, there being also a considerable extent of placer diggings along this canyon and its branches. It would, in fact, be difficult perhaps to find anywhere another spot of like area containing such a variety of ores and deposits of the precious metals, and all occurring under favorable conditions, and in paying quantities. Lying near the Old Telegraph is the Live Pine and St. Marks mine owned by John Tiernan, and covering 17 acres secured by United States patent. This mine has been opened by an immense extent of tunnels, shafts, drifts, crosscuts and inclines, all but the tunnels, which are run in country rock, being in high-grade ore. Comparatively little stoping has been done here, the ground having been developed with a view to establishing large reserves for the purpose of determining the capacity of the works required for reducing the ores, which will have to be treated by both milling and smelting. From the samplings and workings of these ores carried on upon a large scale they are found to contain from $35 to $75 in silver and about $40 in gold to the ton, the smelting ores carrying from 15% to 30% lead. The lode averages 50 feet in thickness, and the ore developed amounts to several thousand tons. That already disposed of was sold at this place, having first been sent to the works at Sandy for sampling. The proceeds of the ore extracted from the mine have more than sufficed to cover cost of its exploitation. In the same neighborhood is situated the Yosemite, another thoroughly developed and well managed property partially outfitted, and capable of making a large bullion production. Located a little further north are

The Big Gold Mines

Of Bingham canyon, of which the following may be accounted the principal, viz: the Excelsior, Jordan, Stewart No. 1 and Stewart No. 2. No where are these ledges less than 20 feet in thickness, their average thickness being about 45 feet, 90% of the vein matter being composed of disintegrated free gold-bearing quartz, that will yield about $15 in gold and $3 in silver to the ton. To a depth of 800 feet below the croppings, this is the character of the entire contents of these immense fissures. Below that level the ore become sulphureted and, consequently, more difficult to treat. It is also believed that they will here be found much poorer and, possibly, of too low a grade to warrant their extraction. This conclusion rests, however, on conjecture, little exploration having yet been made below the line of permanent water. But, supposing the veins to be worthless below that level, these must still rank amongst the biggest gold mines ever discovered, as they must, for a long time at least, continue to be among the most profitable ever worked.

Passing west over the Oquirrh mountains, we arrive in the

Camp Floyd District,

One of the pioneer camps and most promising mining localities of Utah, notwithstanding this, like many other now prosperous districts in the Territory, has seen its era of adversity. The failure here some years ago of an English company whose affairs had been conducted with characteristic inefficiency, gave the whole region a set back, and for many a day clouded the prospects of Camp Floyd, which, through the persistent and well directed efforts of a few live companies, have only of late begun to brighten up. Among these companies, we have, first, the Carrie Steele, who have done on their extensive grounds good work, and a great deal of it, for all of which they are about to reap a rich reward. They have a mine, but it has cost something to get it, not a few days' work and a few dollars, but many of both. The labor and money expended have, however, been wisely and faithfully applied. Neither in fact could have been bestowed to better advantage. The company having demonstrated that they had a mine—that is large and permanent bodies of pay ore—determined upon providing themselves with a suitable mill for its reduction, which also has been done, and in a very few days the Carrie Steele will be placed in the rank of our large and profitable bullion-producing mines. The denizens of your city, who own, I believe, the most of this property, are to be congratulated on its prospects. In this connection, it is pertinent to say that the Carrie Steele stands endorsed by no less an authority in the mining world than Prof. J. E. Clayton, whose opinions are, in this country, considered conclusive on properties of this kind.

In the same broad mineral belt, and near the Carrie Steele, are situated the Midway, the Reno and the Leopard mines, locations somewhat opened up and exhibiting evidences of decided merit. These properties also stand approved of by Prof. Clayton, and will be very likely to figure conspicuously in the future history of this now rising district.

To the north of Camp Floyd there are in the several districts lying along the westerly slope of the Oquirrh range, well-opened and valuable mines, such as the First National, Great Basin and Legal Tender, near Stockton, the Wandering Jew at Dry canyon and others less developed but equally as promising as the above.

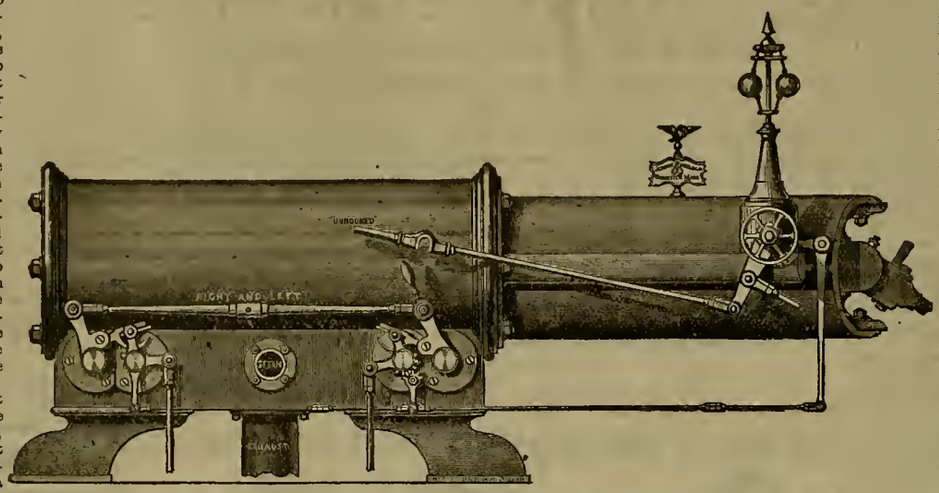

FIG. 2. SIDE VIEW OF CYLINDER OF WHEELOCK ENGINE. (See First Page.)

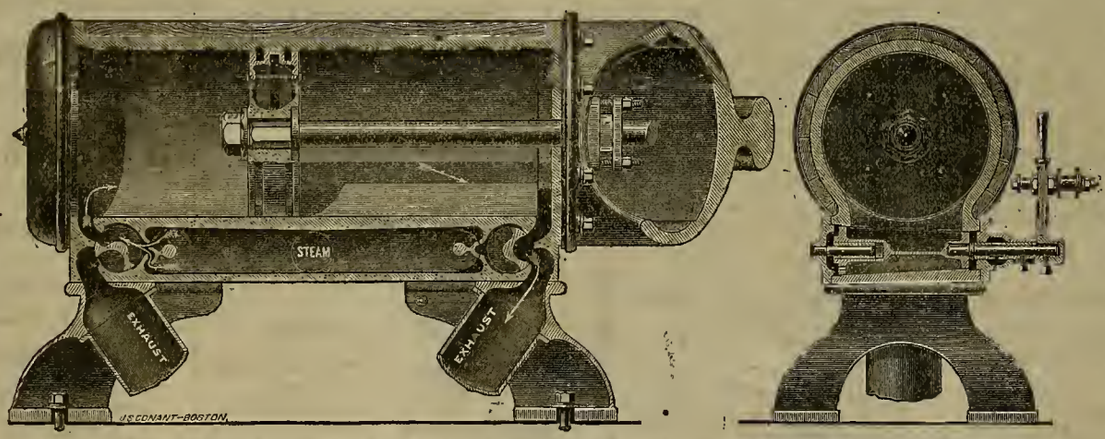

FIG. 3. SECTIONAL VIEW SHOWING ARRANGEMENT OF VALVES ON WHEELOCK ENGINE. (See First Page.)

THE CARSON MINT.—The Secretary of the Treasury has decided to resume coinage at the Mint at Carson May 1st, sufficient bullion having been accumulated to justify commencing operations. The Department is in receipt of advices leading to a belief that silver bullion will be delivered at Carson at prices paid in San Francisco.

LEADVILLE, Colorado, is said to contain 40,000 inhabitants, and 800 a day arriving. Most all the new comers are from the East.

THE Silver Cloud mine, of Dragoon district, Arizona, has been sold to Pennsylvania parties for a large sum.

The Julia Shut Down.

The Julia company will work through the Ward shaft. The pumping apparatus at the Julia is so dilapidated that it is liable to give out entirely at any hour, and if work should be continued at that point it would be necessary to put up new pumping apparatus. A new pumping engine would also be required, as that at present in use is pretty nearly worn out. So much heavy work has been put upon it that it squirms about upon its foundation, and the only wonder is that it did not go to pieces long ago.

In the Julia shaft are six plunger pumps between the 1600 level and the surface and two below the 1600, one of these being at the 1800 and the other at the 2000 level. As the water is only pumped up to the 1600 level, where comes in the south branch of the Sutro tunnel, the pumps above that point are not used—indeed, four of them are used up and cannot be used—except to steady the pump rod, the clacks being taken out of them. The two pumps below the 1600 level are so nearly worn out that they are likely to break down at any time.

This being the condition of the pumping apparatus, the management below have decided to make the Ward the main working shaft for the two mines and to at once commence operations from that point. The Julia company own half the Ward shaft and it is considered a needless expense in these dull times to keep up two establishments. The Julia machinery has been used to sink as far as it has strength to go; work will now be pushed through the Ward as far as the machinery at that point can be made to do the pumping, and when something more powerful shall be required it will be set up at that shaft.

The Ward shaft will be put down to the 2400 level as rapidly as possible, and when that point is reached a station will be opened from which a drift will be run to the Julia ground. The distance to be run to reach the Julia will be 200 feet. The lowest point at which there is at present any connection between the two mines is the 1800 level. Two watchmen—one for the day and one for the night—will be placed at the Julia works to look out for the safety of the property at that point.—*Enterprise.*

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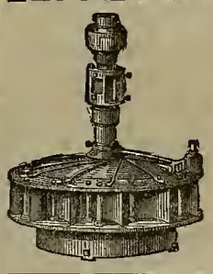
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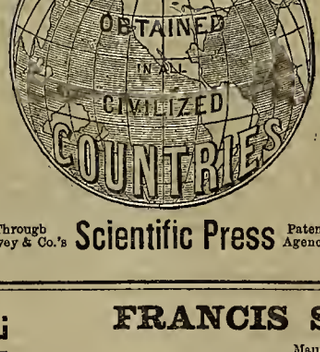

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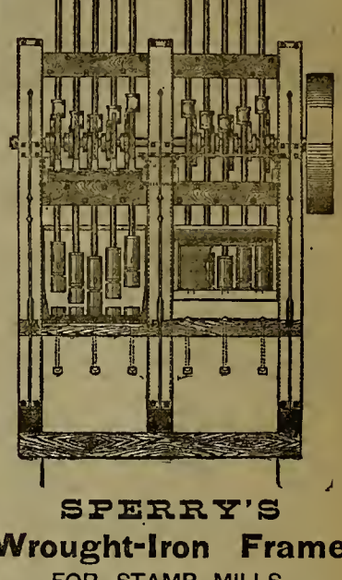

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Every mechanic Should have a copy of Brown's 507 Mechanical Movements, illustrated and described. Inventors, model makers and amateur mechanics and students, will find the work valuable far beyond its cost. Sold by DEWEY & CO., Patent Agents and publishers of MINING AND SCIENTIFIC PRESS, San Francisco. Price, $1, (post paid.

QUICKSILVER

For sale in lots to suit by MAURICE DORE, Agent for the Guadalupe Mine,
410 PINE STREET, SAN FRANCISCO.

CONTINUED FROM PAGE 261.

tance of about 500 ft from the mouth, the breast of which shows two veins of solid ore about two inches thick, which contain iron and copper pyrites, one of them assaying 560 and the other 360 ounces in silver per ton. The famous La Crosse mine continues to pan out well and at present is doing better than ever before. One hundred sacks of ore are now at the mine ready for shipment. The Dictator is now owned by Col. Wm. H. Doe. The breast of the drift running from the shaft now shows a 12-inch vein of decomposed ore. The Murry mine is now owned by the Moore mining company. The first level running east shows an ore vein 18 inches thick and solid, which mills 150 ounces per ton in silver and 20% in copper. The lower level running west shows a vein from 6 to 8 inches in thickness, which mills 150 ounces in silver and 10% copper.

MILL CITY.—Everything in and around this hurg presents an encouraging appearance. A number of old prospects that have lain dormant for a number of years past bid fair to "boom" during the coming summer. Aside from the number of properties that will be worked by the Mansfield mining and milling company, of Mansfield, Ohio, we are informed by Mr. Frank L. Downend, the agent of that company, that he is associated with Mr. A. N. Ghost, of Denver, and Mr. A. T. Lewis, of Springfield, Ill., in another company, and they have already located 10 claims which they propose to work during the coming summer. It is also stated that another company is now being organized in Iowa for the purpose of working several lodes in this vicinity.

DAKOTA.

CALEDONIA.—*Black Hills Times*, April 12: The Caledonis mill started up yesterday with all of her 60 stampe dropping, and the movement of the machinery was as smooth and devoid of jar as a watch. The most sanguine hopes of the mechanics who assisted in its erection have been more than realized. It is certainly one of the best mills that has ever been started up in this or any other country.

IDAHO.

READY.—Owyhee *Avalanche*, April 15: There is a considerable quantity of rock ready for crushing at the Crane & Driggs mine, near the Golden Chariot. The last crushing of rock from this mine averaged $73 to the ton. Mr. Crane and the other parties working it intend to have about 50 tons more crushed shortly. The ledge averages from 8 inches to 1 ft in width, and shows a considerable proportion of gold. The snow is over 20 ft deep around the mine, and has been tunneled through a distance of 100 ft from the outside to the point where the ledge is being worked.

ATLANTA NOTES.—*Idaho World*, April 16: No sickness of any kind in Atlanta. Ten men are at work in the Monarch. The mine is showing up well. The Buffalo company is taking out from 4 to 6 tons of ore per day, from the 1st to the 3d level, and is crosscutting from the 5th level, the bottom of the shaft, but have not cut the ledge. This company is working about 15 men. Miller, of Buffalo, will be at Atlanta by the 15th of June to take charge of the Buffalo mine. Algewahr, the present Superintendent, is going to Wood river to engage in mining. R. B. Brown is going to put up a mill at Queen's river. He will go below in a few days to get the machinery, and as soon as it arrives, work will be commenced on the mill.

ALTURAS county will not be behind any of the other quartz camps of the Territory in the way of a boom this season. And the opinion of a great many of the old settlers of that county that she will advance further the coming summer than during any previous year.

MONTANA.

FIRST CHANCE.—*New Northwest*, April 9: From a gentleman who recently visited this district we get the following interesting account of the country and roads in the vicinity, and the mines at First Chance: The district is situated at the head of Deep and First Chance gulches and extends along the divide between Bear and Elk creek. At Bear Mount the snow is about 4½ ft deep on the level. Traveling up the gulch it increases in depth until at Beartown it is from 4 to 4½ ft deep. To get to the mines from Beartown the traveler takes the trail up Bear gulch to Cave, up Cave gulch to its head and over the steep divide between the latter gulch and First Chance. The depth of snow increases with the altitude after leaving Beartown, until at First Chance it is from 5 to 7 ft deep. A remarkable feature of the snow is that there are no drifts whatever—all lies as when it fell. It is estimated by the miners that from 12 to 14 ft have fallen this winter—an unusually large amount. The mine with the greatest amount of development is the Magone & Anderson. The lode upon which their claim of 1,500 ft is located runs nearly east and west, as do nearly all lodes in the district, and has been traced and exposed for a distance of over 3,000 ft. The owners have done work nearly all along the line of their claim. The Homestake lode of Henry Grant was also visited, and Mr. O. was found hard at work in the development of his lead. He has not reached a sufficient depth to demonstrate the full extent and character of his vein. All the indications, however, are favorable for a large, first-class gold-bearing quartz lode. Prospecting, owing to the large amount of snow, cannot be successfully conducted for several week. It is a fine field for prospectors, and the miners now owning leads there are confident that permanent arrangements will be made this season looking to the development of the camp.

UTAH.

SILVER CLIFF DISTRICT.—*Prospect*, April 14: The excavations for the Plata Verde mill are nearing completion, so that carpenters and masons will soon go to work. The Leviathan's new machinery will soon be in place and ready for business. An 8-inch vein of galena and copper has been reached in the Lucille. The Silver Cliff Smelting company will commence active operations to-day. Twelve men at the Racine Boy take out on an average of three tons per day each. Two loads of ore from the Grey Eagle to the Dora smelter, Friday, returned $100.93. A 24-ft vein of galena and spar has been struck in the Robert Burns lode, at a depth of 90 ft. At the Bull-Domingo there are about 2,000 tons of ore now on the dumps, which, when concentrated, will be worth about $200,000. The Plata Pedra mining company have put a force of men to work on the Plata Pedra mine, for the purpose of getting out a mill run of ore. This company is making arrangements to erect a mill.

AMERICAN FORK DISTRICT.—Salt Lake *Tribune*, April 15: The Silver Bell has commenced work again. They have already 80 sacks of ore on the dump of the same quality that sold last fall for $100 per ton. The Pittsburg is taking out ore as usual, but owing to the condition of the canyon road will probably not make another shipment before the 1st of May. There is some talk of this property being sold to the French company, the present owners of the Old Telegraph of Bingham canyon. The Sunday mine tunnel is being vigorously pushed. Kapper is still working away on the Orphan and taking out ore.

BOGUS dollars are in circulation, and have made their way into Stockton. This coin has a neat appearance, and produces a ring similar to that of the American dollar. The only difference in the two is in the weight, the bogus dollar weighing 30 cents less than the other.

THE Coinage Committee of Congress have decided to prepare a bill to establish a Mint somewhere in the Mississippi valley. They will break up the Mint at Carson, Nev., and remove the machinery to the location of the new Mint.

THE Idaho mine, Grass Valley, is improving in appearance, the barren zone having been crossed. Thirty-five stamps are constantly running.

News in Brief.

THE distress in Ireland is increasing.

THE forest fires in New Jersey continue to rage.

DAMAGING forest fires prevail in the wilderness region of Virginia.

THERE is a strike among the salmon fishers of the canneries on the Columbia river.

IN consequence of the distress in Hungary, 5,000 Magyars have left that country for America.

A GREAT gold excitement prevails in southern India. Remarkable discoveries are reported.

THE Southern Pacific Coast Railroad has begun carrying mails. The grand opening takes place May 1st.

THE Western File Works, Beaver Falls, Penn., were destroyed by fire on Monday. Loss, $400,000.

THE Central Pacific Railroad Company will increase the rate of speed of all passenger trains on the road shortly.

THE steamer *City of Peking*, from China, arrived in the harbor last Sunday with several cases of smallpox on board.

THE ceremony of breaking ground on the East side division of the Oregon railroad, was performed at Silverton on Monday.

THE San Francisco Chamber of Commerce has petitioned Congress to allow the continuance of Wells, Fargo & Co.'e letter service.

THE Union Pacific Railroad has made an advance of ten per cent. in the wages of its employees at their shops receiving $3 per day and under.

CALLAO has been blockaded by six steamers of the Chilean navy, and the Peruvians have been completely defeated in Los Angeles and Mosquiqua.

FOR the year ending March 31st, there arrived at New York from Europe more than 163,000 immigrants. Everything indicates increased arrivals.

BY an explosion at the Giant Powder Works, near Berkeley, on Friday of last week, 25 persons were killed. The remains were so mutilated that not one of the bodies was identified.

THE House Committee on Claims has reported a hill providing for the payment of $5,000 to A. B. Meacham, as compensation for the injuries received by him from the Modoc Indians in 1873.

THE murderer of C. W. Severance, of Marin county, was found to be the Chinese servant on the ranch. The murderer hanged himself in jail, finding that the crime had been poeitively traced to him by the detectives.

THE oil business does not seem to be on the decline. There were 368 new wells completed in the oil regions last month, which produced 6,992 barrels. In February, 278 wells were completed, yielding 4,553 barrels.

JAROSITE WITH GOLD.—We have received from Geo. A. Treadwell, of Arizona, a specimen of a very singular (if not new) mineral, bearing a very near resemblance to jarosite; hut which there is much reason to believe is either a new mineral or a new combination of minerals. Jarosite, as described in Dana's Mineralogy, is an insoluble sulphate of iron and potash or soda, as in the Norway variety. The mineral handed to us by Mr. Treadwell has not yet heen analyzed, but is now in the hands of Prof. Dana for analysis. The last July number of *Silliman's Journal* speaks as follows of this mineral: "This rather rare species occnrs somewhat abundant in the quartz veinstone of the Vulture gold mine in Arizona, whence I have received it from Mr. G. A. Treadwell. It fills cavities from the oxidation of pyrites. Fine, transparent, yellow and dark brown rhombic crystals, almost microscopic, are alternated with cryptocrystalline masses, in which occasionally are seen small, brilliant particles of gold. The Vulture vein is enclosed in walls of a schistose gneiss or mica schist, and the atmospheric decomposition of the sulphide has been so complete, that at a depth of 300 feet, only cubical cavities and a curious structure due to the removal of pyrites are observed; and the mine at that considerable depth is completely dry."

THE FIRST APPEARANCE OF THE YANKEES IN SANTA FE.—The first American who seems to have penetrated to New Mexico was James Pursley—an adventurous fur trader who found his way up the Arkansas, traveled extensively through the mountains of what is now Colorado, and finally worked his way down to Santa Fe, where he went to work as a carpenter, growing rich through high wages, but suffering always a feeling of restraint. An occasional Frenchman had appeared; but Pursley (who, by the way is credited with being the first intelligent man who discovered gold in the Rockies)was the sole citizen of the United States who was there to welcome the immortal Pike when, on that bleak March day in 1806, unwillingly tramped into Santa Fe at the head of his Falstaffian band, hatless, bootless and trouserless through a year's campaigning on the plains and in the mountains. The Mexicans were greatly alarmed by this sudden realization of the proximity of the progressive and well-armed Yankees, and their consternation resulted very unhappily for the few leaders of that conquering tide that finally should overwhelm the effete rnle of Spain in the New World; yet for a long time after Pike's expedition nothing occurred to frighten further the proud and indolent hidalgos.—*Ernest Ingersoll, in Harper's Magazine for April.*

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING APRIL 13TH, 1880.

226,445.—PHOTOGRAPHIC STAND AND ALBUM—L. Dubernet, S. F.
226,404.—SOLDERING APPARATUS—J. J. Johnson, S. F.
226,451.—BRAKE FOR HARVESTERS—J. Jones and A. Pharlss, Lakeville, Cal.
226,453.—CAR WHEEL—James F. Kelly, Virginia City, Nevada.
226,409.—MECHANICAL MOTOR—J. G. Marcy, S. F.
226,454.—VEHICLE AXLE—W. C. Partlow, Oakland, Cal.
226,421.—WINDMILL—O. Rischmuller, Oakland, Cal.
226,466.—SCREW PROPELLER—J. B. Ward, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

BRAKE FOR HARVESTERS.—John Jones and Albert Phariss, Lakeville, Sonoma county, Cal. Patented April 13, 1880. No. 226,451. In ordinary headers the wheels are made with flanges or corrngations formed transversely on the tires in order to give said wheels tractive force. It is therefore impossible to apply brakes to the wheels, since the transverse flanges or corrugations catch on the brake shoes. It nevertheless frequently happens that in hilly land accidents occur from harvesters or headers being unprovided with brakes, and the horses being unable to control the downward movement, as these implements are qnite heavy; snch occurrences are dangerous to the animals and destructive to the machines. This invention consists in providing brakes for the wheels of these implements by which their movement can be regulated in going down hill, said brakes being operated by a rod leading to a convenient point on the machine, where it may be handled by the driver.

CAR WHEEL.—James F. Kelly, Virginia City, Nev. Patented April 13, 1880. No. 226,453. In this improved wheel it is proposed to employ hard or white iron from which to cast it, and as this class of iron is impervious to any tools the wheel is formed complete and ready to be put npon the axle, with oil-holes, lugs for the cap and other requirements, simultaneously with the operation of casting. This is effected hy the employment of a slightly-tapering steel mandrel for the purpose of forming the hole to fit the axle, while the recess at the inner end of the hub and the lugs upon the other end for the purpose of receiving and locking the caps are formed by a core. The cap keeps out all dirt and retains the oil used to lubricate, and fits over these lugs and is locked by them. It may also be held hy a set-screw. By this construction wheels may be formed of hard white iron, finished ready for use in the process of casting.

VEHICLE AXLE.—Wyman C. Partlow, Oakland, Cal. Patented April 13, 1880. No. 226,454. This invention relates to certain improvements in the construction of wagon or carriage axles; and it consists in a novel construction and combination of parts whereby dust-proof caps are provided at each end of the spindle. The spindle which receives the wheel is made of iron somewhat smaller than the box within which it is to run. Upon this spindle two sleeves are shrunk, which extend toward the center of the spindle from each end, leaving space between them, so that the axle-box will turn upon and be supported by the sleeves, which is smaller and serves to retain a fibrous substance, which is saturated with oil or other lubricant. These sleeves are chilled or hardened so that the axle while having all the toughness of iron will also be provided with a perfectly hard surface for the purpose of the journal.

PHOTOGRAPHIC STAND AND ALBUM.—Lucien Dubernet, S. F. Patented April 13, 1880. No. 226,445. The object of this invention is to provide a novel photographic exhibition stand and album in which some of the photographs will be in sight at all times, by being on a revolving stand, and the others inclosed in a series of leaves, like those of an album, said leaves turning on peculiar metallic hinges, and having a sliding rest on which they lie when open. The frames encircling the pictures are fitted with peculiar springs, which keep them closed, but which admit of the ready placing or removal of the photographs. The revolving stand and revolving album combined make a very neat and handsome ornament for a drawing-room table, and the photographs contained in them are easily and readily examined.

THE total number of votes cast at the late election in Great Britain was 2,666,000, which is about two-thirds less than the total vote cast at the last Presidential election in this country.

In the Whole History of Medicine

No preparation has ever performed such marvelous cures, or maintained so wide a reputation, as AYRES' CHERRY PECTORAL, which is recognized as the world's remedy for all diseases of the throat and lungs. Its long continued series of wonderful cures in all climates has made it universally known as a safe and reliable agent to employ. Against ordinary colds, which are the forerunners of more serious disorders, it acts speedily and surely, always relieving suffering, and often saving life. The protection it affords, by its timely use in the throat and chest disorders of children, makes it an invaluable remedy to be kept always on hand in every house. No persou can afford to be without it, and those who have once used it never will. From their knowledge of its Composition and effects, physicians use the CHERRY PECTORAL extensively in their practice, and Clergymen recommend it. It is absolutely certain in its remedial effects, and will always cure where cures are possible.

FOR SALE BY ALL DEALERS.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruher's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually he had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco.

METALS.

[WHOLESALE.]
WEDNESDAY M., April 21, 1880.

IRON.—	
American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	— — @35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 8½
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	—@ 16
Plow Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	—@— —
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	6 @— 6½
Bar	— @— 6½
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per hag	— @ 1 80
Buck, " "	— @ 2 50
Ohilled " "	— @ 2 75
TIN PLATES.—	
10x14 I O Charcoal	— @10 50
10x14 I O Ooke	10 00 @10 00
Banca Tin	—@25 00
Australian	— @20 00
I. O. Charcoal, Roofing 14x20	— @10 00
" " " 20x28	21 50 @22 00
ZINC.—	
By the Oask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	10½@— 11
NAILS.—	
Assorted sizes	6 50@6 75

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public anction; and unless payment is made before, will he sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, 420 Montgomery St., San Francisco, Cal.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 22th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 41), levied on the Eighth day of March, 1880, the several amounts set

opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. Shares.	Amt.
Ashby, Mark T, Trustee	8	800	$80 00
Ashby, Mark T, Trustee	9	500	50 00
Ashby, Mark T, Trustee	10	405	40 50
Ashby, Mark T, Trustee	11	1000	100 00
Ashby, Mark T, Trustee	12	100	10 00
Ashby, Mark T, Trustee	13	200	20 00
Ashby, Mark T, Trustee	14	100	10 00
Ashby, Mark T, Trustee	15	100	10 00
Ashby, Mark T, Trustee	17	400	40 00
Ashby, Mark T, Trustee	18	100	10 00
Ashby, Mark T, Trustee	20	250	25 00
Ashby, Mark T, Trustee	21	50	5 00
Adams, Catherine S....	168	25	2 50
Adams, Catherine S....	169	25	2 50
Brayton, M L.....	246	2000	200 00
Brayton, M L.....	247	575	57 50
Cardwell, S A.....	292	100	10 00
Foy, C W	293	250	25 00
Glavich, M.....	45	30	3 00
Glavich, M.....	46	30	3 00
Goodrich, S S	142	50	5 00
Goodrich, S S	143	50	5 00
Goodrich, S S	144	50	5 00
Goodrich, S S	145	50	5 00
Goodrich, S S.....	146	50	5 00
Goodrich, George B....	179	50	5 00
Goodrich, Geo B.....	180	50	5 00
Goodrich, Geo B.....	181	50	5 00
Goodrich, Geo B.....	182	50	5 00
Goodrich, Geo B.....	183	50	5 00
Grant, R ff.....	290	50	5 00
Harris, James.....	56	50	5 00
Harris, James.....	57	50	5 00
Harris, James.....	58	50	5 00
Holmes, George M.....	118	40	4 00
James, James.....	65	63	6 30
Jordan, Geo E.....	175	100	10 00
Jordan, Geo E.....	176	150	15 00
Lennan, Hosea H.....	184	50	5 00
Lennan, Hosea H.....	185	50	5 00
Lennan, Hosea H.....	186	50	5 00
Lennan, Hosea H.....	187	50	5 00
Lennan, Hosea H.....	188	50	5 00
Maxcy, S N.....	194	500	50 00
Maxcy, S N.....	195	500	50 00
Maxcy, S N.....	196	100	10 00
Maxcy, S N.....	197	100	10 00
Maxcy, S N.....	198	200	20 00
Maxcy, S N.....	199	250	25 00
Mead, L G	216	1575	157 50
Palmer, Wales L, Trus.	80	1000	100 00
Palmer, Wales L, Trus.	81	500	50 00
Palmer, Wales L, Trus.	82	500	50 00
Palmer, Wales L, Trus.	83	250	25 00
Palmer, Wales L, Trus.	265	2000	200 00
Smitheram, Samuel...	221	75	7 50
Swett, E C.....	294	125	12 50
Venning, John.....	63	100	10 00
Venning, John	64	150	15 00

Also, 460 shares of the old issue, equal to 2300 shares of the new issue of the capital stock of the said Gover Mining and Milling Company.

Name	No. of Certificate.	No. of Old Shares.	No. of New Shares.	Amt
Goding, E L.....	115	50	250	25 00
Goding, E L.....	254	25	125	12 50
Goding, E L.....	741	13	65	6 50
Goding, E.....	143	50	250	25 00
Goding, Ephraim...	347	25	125	12 50
Goding, Ephraim...	739	20	100	10 00
Goding, Mrs E.....	740	12	60	6 00
Hildreth, Anna W..	647	25	125	12 50
Lennan, Lewellyn..	337	10	50	5 00
Lennan, Lewellyn..	517	10	50	5 00
Lennan, Lewellyn..	592	20	100	10 00
Lennan, Lewellyn..	679	10	50	5 00
Lennan, Lewellyn..	717	10	50	5 00
Lennan, Lewellyn..	718	10	50	5 00
Maxcy, Josiah.....	209	10	50	5 00
Maxcy, Josiah.....	590	100	500	50 00
Shaw, A W.....	882	5	25	2 50
Shaw, A W.....	485	5	25	2 50
Skinner, E C.....	620	50	250	25 00

And in accordance with law and an order of the Board of Directors made on the eighth day of March, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Monday, the third day of May, 1880, at the hour of one o'clock P. M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale. W. O. WILSON, Secretary.

Office—No. 402 Front street, room 8, San Francisco California.

ANNUAL MEETING.

The Annual Meeting of the stockholders of the Original Gold Hill Gold & Silver Mining Company, for the election of a Board of Trustees to serve for the ensuing year and, also, for the transaction of such other business as may properly come before it, will be held on Monday, the Tenth (10th) day of May, 1880, at the hour of 2 P. M., at the office of the Company, Room 4, 309 California street, San Francisco, California. Transfer books closed on Friday, the Thirtieth (30th) day of April, 1880.

J. M. BUFFINGTON, Secretary.

Office, Room 4, 309 California, St., San Francisco, Cal.

ANNUAL MEETING.

San Francisco Copper Mining Company.

The Annual Meeting of the stockholders of the above named Company, for the election of Trustees to serve for the ensuing year, and the transaction of such other business as may come before the meeting, will be held on MONDAY, the third day of May, 1880, at the hour of three o'clock, P. M., at the office of the Company, 258 Market street (up stairs), San Francisco, Cal.

P. SANCHEZ,
Secretary.

ANNUAL MEETING.

NOTICE.—The Annual Meeting of the stockholders of the BRILLIANT MINING COMPANY, for the election of officers to serve for the ensuing year and for the transaction of such other business as may properly come before it, will be held on Wednesday, the 21st day of April, 1880, (third Wednesday in April), at 2 o'clock P. M., at the office of the Company, room 4, 309 California Street, San Francisco, California.

J. M. BUFFINGTON, Secretary.

Office—Room 4, No. 309 California Street, San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

Black Bear Quartz Mining Company,

Room 13, Safe Deposit Building, San Francisco,
April 16th, 1880.

A dividend (No. 72) of twenty-five (25) cents per share was declared on the capital stock of the Black Bear Quartz Mining Company, payable immediately.

WM. LETTS OLIVER,
Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, Room No. 37, San Francisco, April 15, 1880. At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 54) of Fifty Cents (50c) per share was declared, payable on TUESDAY, April 20, 1880. Transfer books closed until 21st instant.

P. JACOBUS,
Ass't Secretary.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

Manufactory, 17 & 19 Fremont St., S. F.

L. P. DECEN.

MANUFACTURER OF

NO. 10 FREMONT ST., near Market, SAN FRANCISCO

ST. DAVID'S.

A FIRST-CLASS LODGING HOUSE.

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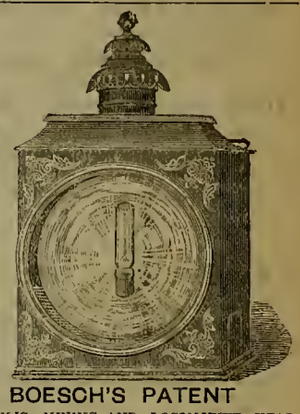

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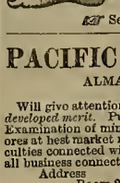

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Found to be more durable than either Hard Steel or Soft Iron. Dry-crushing the hardest rock; will last for months, and without the slightest danger of breakage.

The Pulverizer requires about one-third the power usually expended for the reduction of the same amount of Ore by Stamps.

Price List, Etc., of the White Rotary Pulverizer.

No.	Tons Per Hour.	Inches Diameter.	Revolutions Per Minute.	Horse Power Required.	Shipping Weight.	Lumber Required.	Price.
1	6	56	600	40	12	6,000 ft.	$5,000
2	10	72	470	60	15	9,000 "	8,000
3	16	84	400	75	20	12,000 "	10,000

The Repairs on the Pulverizer will not exceed those of a 10-Stamp Battery.

The Shipping Weight of the entire apparatus is not one-eighth of that of Stamp-Mortars required to do an equal amount of work. ☞It can be placed and put running at the Mill in from fifteen to twenty days.

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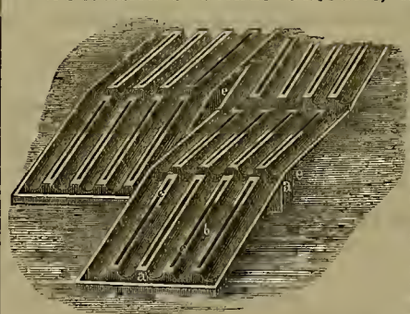
San Francisco, Cal., January 1st, 1880.

Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

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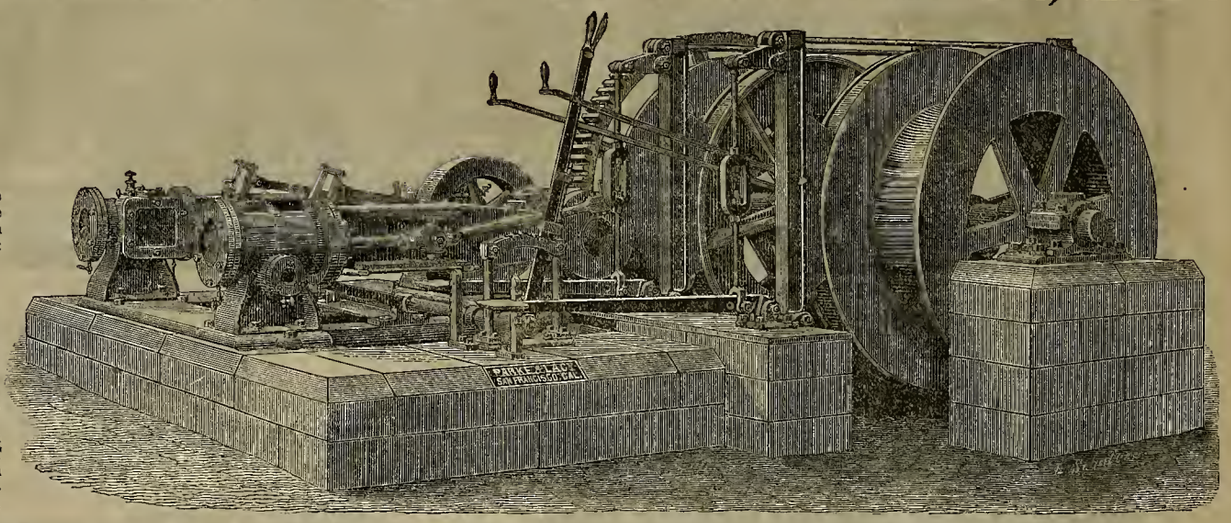

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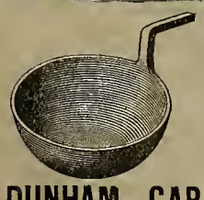

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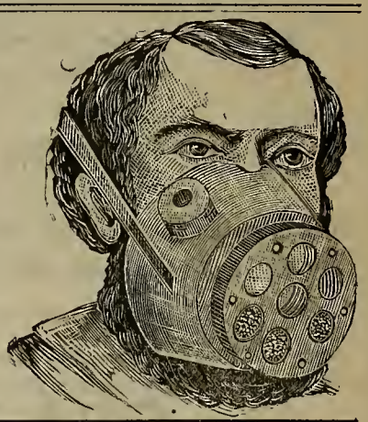

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 1, 1880.

VOLUME XL Number 18.

Copper Leaching.—No. 2.

[Written for the MINING AND SCIENTIFIC PRESS by C. H. AARON.]

Next in order are those ores which, while not admitting of concentration, nor yielding solutions readily without the aid of fire, are yet too poor to be treated by the more perfect, but also more expensive methods.

A good representative of this class of ore is found at Spenceville in Nevada county, where the San Francisco copper company has an enormous vein of almost pure "mundic," containing a small proportion of zincblende and copper pyrites.

This ore carries about 6% of copper, and being mined with great facility, can be worked with profit by a combination of the process already described, with more advanced methods.

It may be objected that this property has never yet made a dividend, but it must be considered that very extensive improvements have been carried out with little capital other than that obtained from the product of the mine, no assessment having been levied on the stock for several years past. Yet it must be admitted to be a subject of regret that so fine a property had not been from the first in the hands of parties having the enterprise and the ability to develop its vast resources in the best way.

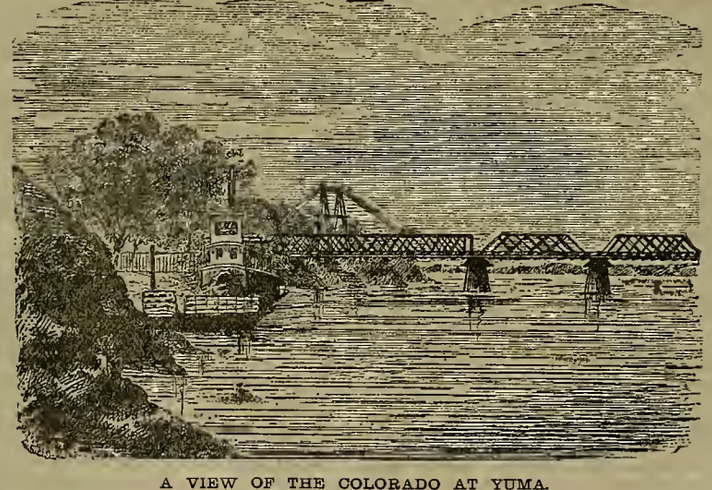
The ore when raised is transferred by a car and elevated tramway directly to the roasting sheds, of which there are several, each many hundred feet in length, where it is dumped in piles of about 100 tons each. In the middle of every pile is a cylindrical chimney, of bricks laid without mortar, and with open spaces between the ends, except a few courses at the upper part, where they are close together. Before the ore is laid down, a circular space around the chimney, about 30 feet in diameter, is covered with cordwood, from 1 to 2 cords being enough for 80 or 100 tons of ore. Upon the wood and around the chimney the ore, in lumps from the size of an egg to that of a man's double fist, or even larger, is thrown, till a mound is formed nearly to the top of the chimney, containing, as said, about 100 tons. This is then covered with fine ore, or with residues from the leaching, to the thickness of a foot or more. The wood at the bottom is fired through openings arranged while building the pile, and, once thoroughly ignited, the ore continues to burn without additional fuel, owing to the large quantity (about 50%) of sulphur in it; indeed, it requires to be very carefully watched, and kept well covered with fine material, to prevent its burning too fast, and producing so much heat as to form a matt, and so spoil the roasting. The fumes pass into the chimney by the interstices between the bricks, and escape into the air. The operation is, in fact, precisely like burning a pit of charcoal, except that instead of taking five or six weeks to complete it, it requires as many months.

When I say that 6,000 tons of ore, or some 60 piles are thus kept constantly burning, one-half being sulphur, it will be understood that the surrounding country does not suffer for want of the disinfecting virtues of sulphurous acid, and the disposal of this enormous volume of sulphur fume has become a subject for serious consideration by the company, as it is not only very injurious to human health, but also deadly to every kind of vegetation, so that the question unavoidably recurs, whether it would not, after all, have been better, as strongly urged by me, when I had the honor of superintending these works, long before they had attained their present magnitude, to have adopted a process which, though rather more expensive at first, would have consumed less ore, and made proportionally less stench, in producing the same quantity of copper, and probably have been more profitable in the long run.

The problem, however, now is what to do with the fumes, and it is one which may well engage the attention of other parties who may contemplate the establishment of works on a similar scale. To collect the smoke from all the burning piles into a single flue does not seem to be difficult, and in this alone there might be some advantage, since it could thus be readily conveyed to a distance, but that is scarcely enough. To absorb it by means of water, even if practicable, would only raise another difficulty in the disposal of the water, besides which it will not remain in water, but will be constantly escaping wherever the water flows. To make it into sulphuric acid would cost heavily for the plant, and as about 60 tons of strong acid, or a larger quantity if weak, would be produced daily, it seems doubtful if it could be given away, much more sold.

Theoretically it is possible to reconvert this smoke into sulphur, and as but little fuel is used in the piles to produce soot, which has been found troublesome in former experiments of this kind, there seems no reason why a good article of sulphur should not be made, and if it would only pay the cost of production, the indirect benefit would be very great.

The roasted ore from the piles is removed to the wooden vats where it is soaked in water or weak solution, which is heated and boiled for some time by a jet of steam. The *green* solution thus obtained, containing copper and iron sulphates, and free acid, is, after settling and dilution, transferred to large barrels mounted on rollers, and revolved slowly by steam power. Each barrel contains several tons of scrap iron, by which all the copper in the hot solution is thrown down in a few hours. The decoppered solution is allowed to go to waste, there being no market here for the large quantity of green vitriol which could be made from it. The precipitated copper is washed, dried and sold as cement copper, or melted into bars.



A VIEW OF THE COLORADO AT YUMA.

The ore from the boiling vats, which still retains nearly half the original quantity of copper, owing to the imperfect manner of roasting, is dumped in a vast pile on a sloping floor formed of sheets of felt dipped in melted asphalt and coal tar, and laid on the ground, and is continually leached by percolation of water or waste liquor, yielding its copper slowly but inexpensively, as the remaining sulphides are gradually decomposed by the action of air and moisture.

Why the revolving barrel is used for the precipitation in preference to a stationary vat, is not quite clear. When, some years ago, I took charge of these works for the purpose of testing the feasibility of leaching the ore, I found one of these barrels there, and understood its purpose to be, mainly, to exclude air during the precipitation, and so prevent the contamination of the copper by insoluble basic salts of iron, which form in large quantity when the solution, under certain conditions, is heated in an open vessel in contact with metallic iron. I found, however, that so long as this unfavorable state of the solution existed, the barrel gave no cleaner copper than an open vessel, and when, by adding acid, or by other means, the solution was so changed as to yield clean copper in the barrel, it did so equally in an open vat; nor does the operation in the vat require more time if the liquor is kept in gentle motion by means of a jet of steam. Moreover, the barrel is more expensive, both in construction and in operation, requiring as it does machinery and power to move it; and, to crown all, it is not free from danger, as is shown by the fact that several persons have been injured by it, myself among the number, owing to the evolution of hydrogen while working.

At the commencement of the leaching operation, by the present company, the roasted ore was leached with cold water, yielding a solution of a dark brown color, containing copper, iron and zinc, and yielding, in precipitation with iron, a copious gelatinous precipitate mixed with the copper. The addition of sulphuric acid turned the solution green, and gave clean copper; but this was found to be rather expensive and inconvenient. The sulphurous fumes from the roasting piles answered the same purpose, and some experiments were made with a view to a practical application, but the plan which was ultimately adopted as the most effective and convenient under the circumstances was that of boiling the solution for about an hour with the imperfectly roasted ore, by which a slightly increased yield of copper was obtained, and the solution became green, instead of brown, indicating a formation of free acid (vide Kerl's Metallurgy) and gave a clean copper.

If the brown solution got by cold leaching is boiled in contact with raw ore, it acquires a blue color, also giving clean copper on addition of a piece of iron. Simple leaching with hot water is not sufficient to give a good solution; actual boiling or long digestion with heat is necessary. An addition of salt was tried without marked benefit.

This is a very cheap way of working ore, and might probably be adopted with advantage in other localities, though, where the ore is a little richer, or of a different character, especially where silver is also present in paying quantity, the Hunt & Douglas process, which will form the subject of my next paper, would be preferable.

GLADSTONE has been chosen Premier of England, and the remainder of the British Ministry will be as follows: Earl Granville, Secretary of State for the Foreign Department; the Marquis of Hartington, Secretary of State for India; H. C. E. Childers, Secretary of State for War; Lord Sehorne, Lord High Chancellor; Wm. E. Forster, Chief Secretary for Ireland; Lord Northbrook, First Lord of the Admiralty; Sir Charles Dilke and Chamberlin have received offers of Under Secretaryships. Chamberlin declines and Sir Charles has not yet accepted.

THE following appointments have been confirmed by the U. S. Senate: William A. Newell, of New Jersey, Governor of Washington Territory; E. J. Smithers, of Delaware, Consul at Chin-Kiang; E. M. Marble, of Michigan, Commissioner of Patents; William H. Berry, agent at Los Pinos; J. C. Tiffany, agent at San Carlos.

Mining Dividends are not Always Judicious.

While it is undoubtedly gratifying to the holders of mining shares to receive dividends early in the working of a mine, the question arises if it is not injudicious to make them until the mine is fully opened and its ability to sustain its operations by its own product is established beyond cavil. There will frequently arise in the development of a mine occasions where the outlay of a considerable excess over general average expenditure will be absolutely necessary to maintain its future prosperity. Dead work will have to be carried forward through barren and unproductive portions of the vein. Shafts will have to be sunk through rock that will not yield ore, and a numerous catalogue of such contingencies might be given, each one of which would be fatal to the existence of the mine if it should not be overcome. The main shaft should be two or more levels deep beyond the level on which the ore is being extracted. Those levels should be run in advance of the requirements of the mill for ore, and also to enable a fair average quality of ore to be sent to mill at all times. The richness of a vein is rarely, if ever, uniform throughout its entire extent. By having these levels opened ahead of the work, good ore can be taken out of them to mix with the lower grade in the upper levels. To accomplish the sinking of the shaft and running the levels mentioned, entails a large outlay of money. If the first profits of the mine have been paid out in dividends, there will be no funds on hand to carry ont this work. Assessments will have to be laid, or a suspension of the work ensue. If the stockholders were certain of future dividends, and knew that the profits of the earlier work were being held in safe reserve to meet any emergency that might arise, or were being expended in more complete opening of the mine, they certainly would not find fault at such judicious management. They would know that such a system would ensure more ample dividends when such expenditure had accomplished its work. They would see that it would be folly to exhaust the treasury while a prospect, or a probability, of needed outlay might become a reality. The payment of dividends from the first proceeds of the mine may result in seriously crippling it. It would hold out false representations of its ability, and would give rise to suspicions of failing productiveness, if not continuous at all times. The mine that takes the more sensible plan of using its means for wider development, is the one that will be the most permanent, and will meet with the highest approbation from its stockholders.

The Railroad Bridge at Yuma.

We give on this page an illustration from Conklin's "Picturesque Arizona," showing the railroad bridge over the Colorado river, at Yuma. This bridge conveys the passenger from California into Arizona and is an assurance to him that the "frontier" is vanishing before the advance of enterprise and industry.

An interesting incident is related in connection with the completion of this bridge. From a misunderstanding between the civil and military authorities, orders were carried to the military headquarters at Fort Yuma, not to allow any of the Southern Pacific rolling stock whatever to cross the Colorado, and to stop the construction of the bridge. A sentinel was placed at the bridge to keep watch. Deceived by the quietude of the railroad party, he went to sleep. The railroad men stole a march on the "army," and in three or four hours the last quarter of a mile of track was laid, including a section of the bridge. The right of way to the company for crossing the Colorado ended on the following day, Sept. 30th; but on the 29th, at 11 o'clock at night, they ran the first steam cars over this bridge from California into Arizona. Since then the road has been extended some 30 miles or more beyond Tucson, and has brought Arizona into prominence and prosperity many years before such a thing could have happened without a railroad.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Letter from Amador County.

EDITORS PRESS:—On sither hand of this little hamlet lie some of the historic mines of California. Along ths ten-mile stretch of the mother lods, rsaching from Jackson to Plymouth, are situate as many voted properties as can he fouud within any like space slsewhere iu the State. Hsre, half a mile north of Jackson, is ths Oneida, a vsteran gold producer, runuing its 40-stamp mill right along, as it has done with but little interruptiou for many ysars. Next, a little furthsr on, near the town of Sutter Creek, is the famous old Hayward mine, uow the Eureka, wbich iu its day has enriched a good many men, and will probably enrich a good many more. Ths company is now putting down a new shaft to supply the place of that hurned out and filled with water some time ago. This new shaft will opeu up a great extent of fresh and valuable grouud, and give a new lease of life to the mine. Meantime the company's 40-stamp mill remains unemployed. A little furthcr this way brings us to the Lincoln mine and 40-stamp mill, hoth in active and successful operatiou. Journeying on a mile and a half hrings us to the Keystone, to which the same remark may be applied as to the Lincoln—a hig mine and a 40-stamp mill turning out hullion at the average rate of abont $55,000 per month. Next, qnartsr of a mile north of Amador City, is the original Amador mins, witb 40-stamp mill, which ie not just now running, though new and promising ore developments are iu progress. The 10-stamp mill of the Bunker Hill company, a little this side, is doing steady and good work, and their mine is looking well. Between this point and Drytown, two miles further north, we bave, first, the Gover, running 10 of their 20 stamps, the ledge having contracted, reducing the ors supply temporarily; then the Pennsylvania, where also ore extraction is suffering au interregnum pending fresh developments likely soon to he made; and the Seaton, operating with fair results.

Passing Drytown, we reach ths old Potosi, now the Califoruia, a right sterling property, with a 10-stamp mill, nearly new, which, it is said, will soon he started up. This mill should not have been idle so long, as in fact it would not have been but for the mishaps that from time to time have befallen the owners, nonc of whom appear to be men of largs means. As very little money would put this mine in good condition for hullion production, enough to suffice for that purpose ought to he forthcoming from some quarter, since with such aid large and long continued profits would he sure to attend its active working. Thsre is not on the mother lode a mine that can show so much good ore in sight as this. At Plymonth, the Empire mine, tbe next important property to the California, is yielding enough ore to keep the company's 80-stamp mill busy day and night, a condition of things that will probahly hold here for a long time, the ore reserves in this mins being large.

Tbe course of tbe mother lode in tbis vicinity is ahout north northwest, and, while this vein carries the heavisst hodies of ore, ssveral of thoss running parallsl with and lying a short distance to the east of it also coutain large ore deposits, those on the Gold Mountain claim heing fully 40 fest thick. The ownsrs of this propsrty will soon start up thsir mill, the furnace for roasting the ore beiug now ahout completed. It is expscted that a handsome production of bullion will he made here, as the ore is ahundant and of good grade, though somewhat intractahle. The furnace here is built of soapstone found in large quantity about one mile from the mine. This stuff, which is sawed out in blocks of just the right size and shape for constructing the furnace, has been tssted and found to stand a higb beat hetter than English fire brick.

The main shaft of the Zsile mine, near this place, is hsing sunk another hundred feet. Tbe company's large new mill is ruuning hut 25 of its stamps, owing to insufficiency of water, a trouble that will soon be remedied, arrangements having heen made with the ownsrs of the Moore ditch for a full and steady supply. Good ore is bsing raised from tbe Yellow Jacket mine, a tsst crushing of which is about to be uade at the Bonanza mill. Some of this ore is as rich in gold as any ever found in this vicinity, and the entire mass coming from the mine will yield at least $20 psr ton under the stamps. The Yellow Jackst nine is situated on the Crown Point lode, one of a scries of three small quartz vsins that intsrsect the mother lode near this place, coming in from the soutbwest.

After a long intermission, the hydraulic mines in this neigbborbood are all at work and, witb the prospect of good weather and a full water supply, are likely to turn out this season very nearly their usual complemsnt of gold dnst, wbile the otber hranches of placer mines will do hetter this year than usual. J. S.

Drytown, Cal., April 21, 1880.

THE Senate has confirmsd the appointment of Edgar M. Marble, of Michigan, as Commissioner of Patents, to take effect May 1st.

Mining Kings in Utah.

The veteran and succssful miniug meu of this country are mainly to hs fouud on ths Pacific coast, and nine-tenths of thsm within the States of California and Nsvada. Among them are numhersd eome of ths richest men in this natiou, but their's is not inheritsd wealth. It is largely the rssult of hard, persistsnt work in a lins of industry that ahounds with examples of sudden outcomes of profits, as nature's hoarded trsasures are unearthed hy the patient, hard-working minsr.

A comhination of adverss circumstancss such as communistic and hostile legislation in California, a falling-off in the outcome of the Comstock bonanzas, witb incidental drawbacks unnecsssary to mention, taken in connsction with the great mining sxcitsmeut in Colorado, have induced some of thsss mining kings to figure on Wall street and on the eastern slops of the Rocky mountains. Ths New York press has been juhilant over the eastern flight of thess occidsntal chiefs, on the presumptiou that the seat of mining empire was ahout to be removed from ths Golden Gate to the neighborhood of Hell Gate on the East river.

But in the future, as in ths past, the mining centere of this continent, ars to he on ths western slops of the Rocky mountains. The largs preponderance of mineral areas, the great bonanzas of the world, the deep and permanent veins of precious metals lie hstween the Rockies and the Pacific. The mining magnates of this coast are aware of these facts and they propose to abide and profit by them. Better than any other class of men, they know how to open and develop these great mines. No picayunish managemsnt characterizes their opsrations. They are the men we want here in Utah, and we are glad to know that their trusty agents and expsrts have been and are spying out and getting hold of Utah mines. The Ontario is under the management of coast men, as wsll as otbsr mines of less nots iu the Tsrritory. From this time on, men and capital from California and Nsvada will flow into Utah. The immense amount of work expendsd on our mines the last four or five years, exposing true fissure veins and large deposits of lead, silver and gold orss, in connection with the low prices of mining property and the absence of speculative inflation in all dspartments of business, make tbis Territory tbe hest and most inviting field for mining investment of auy on this continent. Eventually the timid men of the East will venture across the mountains and invest their capital in the great coal and iron fields—the porcelain clays, marble qnarries and sulphur dsposits of this magnificent Territory. But the money kings of the Pacific coast have the nsrve and the wealth needed to at once occnpy and develop the gold and silver fields of Zion, and to them we rightfully look as the future millionaires of Utah.—*Salt Lake Tribune.*

Bald Mountain Gravel Mines.

In the tunnel of the Bald Mountain extension company at Forest City last month, 100 feet of tunnel was run in the brief period of 21 days, through cemsnt or mountain lava. Holes are drilled in the face of the tunnel from 3½ to 4 feet in deptb, every blast throwing out about 2 fest of rock. Ten ponnds of giant powder ars nsed for eacb day and night shift of 24 hours. No timbers are required, and on completion, sbould the lava formation continue, this air-line tunnel will never need repairing, and bs a permanent "open sesame" to the insxhanstible treasure vanlts of Bald Mountain. The dimensions are 6½ fest high hy 5½ in width. Fifteen carloads of csment are run out every 24 hours, which, considering the present length of the tunnsl (over 1,700 fest), and also that only band-power is employed, is a very creditable amount of work for four men in tbs short time allowed. The water in the air-shaft has a fall of 64 feet, thoroughly veutilating the tunnel. The supposition now is that possibly undersath the strata of lava there may be a rich gravel hed conrsing through the South Fork to the Bald Mountain extsnsion ground.

In the history of gravel mining on this coast, or perhaps the development of the broad, rich and extensive mineral belts in the most noted gold-bearing countries on the globe, it would he very difficult to discover a gold mine that has in a few years yielded such princely dividends on an insignificant investment as the now famous Bald Mountain of Forest City. On an outlay of $25,000, cost of sinking a shaft, running a tnnnsl and the purchase of a water right, since the claim was first opened in 1871, an income of over $800,000 has heen realized witb aggregate receipts at fully $1,500,000. Since the advent of water season, last Decemher, the sum of $40,000 has been divided among the stockholdsrs. The Decemher was the best monthly yield, amounting to $23,200. One hundred and twsnty men are now employed. All except a few, the bosses and those who work in wet and dangerous places, are paid three dollars a day, making the lahor expense alone foot up to near $10,000 a month, which, inclusive of the conntless incidentals, amount to quite a round sum for a single gravsl mine to circulate in a mining camp where the houses could almost be had for the asking before the gold vaults of Bald Mountain were nnharred. As the channel is over six hundred feet wide, this rich ancient river hsd promises to yield tbe same large dividends for an indefinite period, and course through tbe entire ridge to the Savage, Sierra City aud Gold Lake.—*Downieville Messenger.*

Ho! for the Gunnison.

Should nine-tsnths of tbe men and womsn now in Lsadville who say they ars going to ths Gunnison this spring kesp their word, thsre will not hs psople enough left to operate the mines in ths Leadvills district now opensd. Ons can scarcely find a miner, a prospector, a provision dealer, a grain msrchant, a gamhler, a saloon keepsr, a dance-house "rustler," a cigar merchant, a news gatherer, a showist, a muls kicksr, a wood vender or a printer who ars not prsparing to leavs for the Gunnison as soon as they can settle up and procure ths necessary outfit. And thsy ars now starting. Probably no less than 200 msn lsft this camp ths other day. Ons squad of adventurers numhering 30 men "chipped in," honght a span of mules, a harness and a wagon, and with their guns and rnhher hoots set forth. As they marchad down Chesnut strest thsy wers noticed. In answer to the inquiry as to bow they sxpected to get thsir mules and wagon over ths range, the captain of ths outfit said that thsy would carry tbsm over on snow-shoes if no othsr inlet to the Gunnison country could he found. Thsy wsrs headsd for some distant southern pass, thsy did not know exactly whsre. All they eeemed to know or care ahout was that thsy were going to the Gunnison, and from their determined attitnds one was impressed with the conviction that what thsy bad undsrtaksn would be accomplished.

Those heavily loaded with Leadville city lots may not like to have these facts go ahroad, hut thess are facts, neverthelsss. It was about the same last spring. During the months of April and May one year ago a large portion of thoss who had wintered in Lsadville went to the Gunnison country, but they were prstty much all back in the city by the 1st of September. During the hight of ths outgoing stampede, city propsrty went down to notbing. Lots that are now hsld from $500 to $2,000 could bave heen purchased at the buyer's offer, no matter if the offer had been none other than a yellow dog. A decent-sizsd jack would have taken the bsst rsidence lot in the city. Fortune hunters, according to Gov. Talhot, are a good deal like merino sheep—whsn one scoots they all follow, and each one in the herd go it blind. Not one in a thousand now scooting for the Gunnison have any idea where they ars going. Somebody says that a prospect hole somewhere has besn bonded for 60 days for $50,000 and 10,000 msn rnsh to look at the imaginary hole. But it's fnn.—*Central City Register.*

Surface Ores.

John Steele, says the Virginia *Enterprise*, has contracted with the Sisrra Nevada company for the privilege of taking out ors from the old croppings on Cedar hill. In tbe sarly days a large amount of free gold was taken out of the dehris accumulated on the southern slope and foot of Cedar hill by hydraulic process. Mingled with this dirt was a great amount of quartz rich in gold, much of which showed free gold on tbe surface and occasional pieoes of which were heautiful specimens, being almost covered witb bright spanglss of gold.

The ledge or deposit whence all tbis gold and tbese valuahle quartz specimens came has never been found. The dirt that was worked by hydraulic process lay in strata, showing that it had been subjected to and depositsd hy the action of the water. No douht ths channel of Cedar ravine (at pressnt much lower) was at one time along the side of Cedar hill, where this hed of rich dirt was fonnd. Somewhere above where the pay gravel was found the water of the ravine must have ent through ths top of a vein of very rich qnartz, but tbe exact spot has never been found. Although drifts have hsre and there been run into the deposit of placer dirt, the courss of the old channel has never heen followed through those parts where it cut into and impinged upon the bedrock forming the face of tbe hill. One of these days soms person working in this surface dirt and in the croppings along down the side of the hill will make a tremendous find, and we hope that John Steele may be the lucky man. No man on the Comstock is bstter acquainted with Cedar hill than he. Almost ever sinca he has been in the town he has had more or less to do with surface workings on said hill, and has at various times taken out largs amounts of money. The whole hill is so rich iu gold that could water hs obtained, as in many places in California, it would pay to sluice down everything sluiceahle found upon its surface.

HEAVY MINING SALE.—Says the *Times-Review:* The mines in Centsnnial district, 19 in number, have, we are reliahly informed, at lengtb heen sold, and the purchase money, $1,000,000, deposited. Thess mines embrace some of the best propertiss in the northern end of the county. Many of them have heen prospected for two or three years, and from the accounts we have received of them, it is safe to say that Centennial will, in the near future, prove to he one of the best bullion producing districts north of the railroad. The new company—organized in Chicago—sxpect to commence work about the 1st of June. A number of Tuscarora prospectors will be benefited by this sale, having spent their all in developing claims, which further work will doubtless prove to be good mines. Messrs. A. D. Meacham and S. B. Morrey who made the eale, are still in tbe East, hut are expected here by the time tho company is ready to commence operations.

Antelope District.

Mr. Wm. Whalsn, of Antslops district, favored ths *Sentinel* with a call yestsrday; likswise, with some rich spscimsns from his mins. Mr. Whalsn is sanguins that Antelops will havs a hoom this season. Hs says ths mines are thers to warrant it, and the camp cannot bs kept down when ths public becomes apprised of its grsat merit. Ths ledges ars hold and well-definsd, and the ors of a paying grade. Devslopments on ths mins of W. Strandberg & Co., hetter known as ths Italian claim, are furthsr advanced than on any other mins in the district. On this mins a winze has hsen sunk in the ledge to a depth of 196 feet. Ths lsdgs at tbis point has an averags width of 25 fsst. Ths ore occurs in chambsrs or bonanzas, ths sams as in the mines at Ruby Hill. They have 100 tons of ore on ths dump, averaging $83.75 per ton in silver, and carrying 60% of lead. This is certainly a most flattsring showing. The mine is looking especially well at ths bottom. Msssrs. Strandherg & Co. will commence shipping ors to the Eureka furnaces in a few weeks, and will make rsgular shipments thersafter.

Mr. Whaleu is sngaged in devsloping his Sierra Nsvada mins. This is a mammoth vein, heing 200 feet from wall to wall. It has a magnificent outcrop, and is easily traceahls its entire lsngth of 1,500 fest. Ths ore assays, near the surface, from $100 to $120 to the ton. The new shaft is down 45 feet, sbowing ore to the bottom. Considerahle ore has accumulated on the dump, which will bs shipped to Eureka for treatment, next month. On the whole, Mr. Whalen is in bigh spirits ovsr the prospects of Antelope, and he is sanguine that ths district will send up large shipmsnts of custom ors until they can get a furnacs of their own.

A number of prospectors have lately sntersd the camp with the view of acquiring and developing mines. It seems prohahle that Antelope will become an important point before the summsr is over.—*Eureka Sentinel.*

Grass Valley Mines.

Quartz mining in the Grass Valley district has hesn greatly interfered with in the last few monthe, by the unexampled severity of the winter, which has prevented prospecting and rctarded the operations of quartz and wood hauling, therehy placing an embargo on such companies as had not provided against the contingencies of bad roads and deep snows. The old established mines continned work without interruption. Witb ths advent of spring, and a promiss of settled weather, preparations ars heing made for a general resumption of work, and the outlook is considered favorahle for a season of activity in this character of mining in this vicinity. There will be increased work in some of the old mines, and there will bs sveral now ventures, or rather a revival of claims formerly worked. Among these will he the Sebastopol, a mins of excellent promiss, which has bsen standing idle sincs 1858. The Idaho mine, which during its life has yisided hetween five and six millions of dollars, continues to pay rsgular monthly dividends, and has shown an improvement in the lower levels of late, which give good rsasons for believing that tbe dividends will not only continue but increass in amount. The developments made in the New York Hill mins, during the past year, have bssn important, and its return to dividsnds is an indication that it is becoming a really valuahle mine. Negotiations are taking placc looking to the opsning of several mines, but they are not sufficiently advanced to speak of thom definitely.—*Grass Valley Union.*

MILL CREEK.—Messrs. H. F. Band and Dr. Roe just returned from Mill Creek, whsre thsy have been for the past few days, arranging for working the mines owned by the Homer Land, Mill, Water and Mining Co. Provisions and tools have been forwarded, and men placed at work rnnning a tunnel, grading roads and sinking a shaft. They report the prospects of thsir company as being favorable, and that of ths camp as bsing the biggest booming mining camp in Mono county. The roads are good, excspt through Cottonwood canyon, where the snow still obstructs travsl. A few days' warm weather will soon clear it out and make the best and most available road to Lundy. Ths doctor thinks those going to Mill Creek will save four miiss of travel by turning off from the etage road at Martin's station and taking Martin's cut-off. Accommodations at Mill Cresk are meager. George Marks has fitted up a lodging house supplied with spring beds—a luxnry nnknown in any other house in town.—*Bodie Free Press.*

AN old maxim reads, "alwaye look for a dollar whsre you lost it," and its application may become of use to those who are making foolish investments in mining property, as many are doing now, especially in the newer mining districts, whsre reduction works are of limited capacity and all expenses high. Undonhtedly many will find to their sorrow that they cannot work their new propsrties and make both snds meet; and the foolish ones will throw away the experience they have pnrchassd so dearly, but tbe wise ones will profit by it and in the end reap a fortune. It is the road that all snccessful miners have had to travel, and new comsrs must not calculats npon bsing exceptions.—*Georgetown Courier.*

MECHANICAL PROGRESS.

Temperature of Steam at Different Pressures.

Steam is much used for both heating and boiling purposes, especially where a uniform and known degree of heat is required, as in the manufacture of celluloid, etc. By increasing the pressure, the temperature is increased; by diminishing the pressure, the boiling point is lowered—that is, the temperature of the steam (or vapor) is reduced below 212°; thus, at a pressure of about ½ an atmosphere, or 7.35 pounds, the boiling point of water is lowered to 180°, and in vacuo it boils at 125°, or even lower. Both these principles are utilized in the arts; the high temperature of steam under pressure, for example, in the extraction of gelatine from bones, the vulcanization of rubber, conversion of celluloid, etc.; while the opposite process is constantly made use of in the arts to concentrate vegetable extracts, to distill volatile principles, essences, etc., under diminished pressure (or in vacuo), and consequently at a temperature below that at which they would suffer destruction by heating, or contamination from other substances from which they are to be separated.

The following table gives at a glance the temperature of steam at different steam pressures:

Steam Pressure.	Temperature of Steam. Regnault.	Nystrom.
14.7 pounds	212° Fah.	212° Fah.
25 "	240 07 "	241 "
50 "	280.89 "	282.8 "
75 "	307.42 "	309.8 "
100 "	327.6 "	329.9 "
150 "	358.4 "	360 "
200 "	381.8 "	382.6 "
300 "	417.7 "	416.5 "
400 "	445 1 "	441.9 "

PLUMBAGO AS A LUBRICATOR.—The *Engineer* gives the following example of the value of black lead as a lubricator: "A fly wheel shaft bearing, eight inches in diameter and ten inches long, carried a load of nearly 10 tons. The bearing was supported on a box girder, and was lined with good brass. The engine could not be run, as this bearing inevitably got red hot after a few revolutions; various oils, tallow, sulphur and gunpowder were tried with most indifferent success. By using a mixture of tallow and sulphur the engine could be run half an hour at a time, and once or twice has run a whole day, the shaft making sixty revolutions per minute. It was determined to have a new crank shaft with longer bearing, but as at the last moment the use of black lead and tallow was suggested, a package of this ordinary black lead used for stoves was worked up with some tallow, the bearing carefully wiped, and the grease box on the cap filled with the mixture. The bearing never heated again unless oil was allowed to get access to it. The success of the plumbago as a lubricator was perfect. It should be added to the foregoing that while the principle of lubricating by graphite, or plumbago, is scientifically correct, and has in thousands of instances been practically illustrated, it has been damaged seriously by use of impure graphites. For perfect success the graphite should be absolutely clean."

ALLOYS OF IRON AND ZINC.—The alloying of iron and zinc is a very difficult process. The trouble seems to arise from the fact that, at the temperature at which iron melts, zinc is rapidly volatilized; and, if the zinc is added to a mass of molten iron, it decrepitates and soon disappears by volatilization, so perfectly that, after a short time, not a trace of it will be found in the metal. But, by taking the special precaution of introducing the zinc beneath the surface of a bath of melted iron, through a well-heated iron tube, alloys of these metals have been formed; but they have only a scientific interest, and are of no account in the arts. When iron is left for some time in contact with molten zinc—as in the process of galvanizing—a portion of the iron is dissolved, and forms an alloy of zinc and iron, which appears to have a definite constitution—21 zinc to 1 iron. If the iron is left long enough in the zinc, it will entirely disappear. The alloy appears to be of little use, as it is coarse-grained and brittle. The only practical use to which it has been put, we believe, is, as an impure zinc, in the refining of base bullion, for which commercial zinc has hitherto been employed. The alloy appears to be very well adapted for such a purpose, and has the advantage of cheapness.

HEIGHT OF FACTORY BUILDINGS.—Continued attention is being called to the non-economic and dangerous practice of erecting high buildings for factory purposes, of which full mention was made in these columns in our issue of April 3d. It is now thought that ere long the cotton mills of New England will be built with one story, instead of with five or six, as at present. The advantages claimed are increased safety and convenience, and a higher speed for machinery. The report of a New England gingham factory on last winter's use of a one-story building, was that it covered about an acre, was built of brick with corner towers, at a cost of $23,000, and saved in gas alone a sum equal to the interest on the cost of the building. The looms were driven at 12% higher speed than on the second floor of the old mill, the repairs were fewer, and less imperfect work was turned out.

Smelting Iron with Oil.

Some elaborate experiments have recently been made at the Fanny Furnace, in West Middlesex, Penn., under the direction of Prof. Robertson. What is considered a final and successful test is described by an eye-witness as follows:

The furnace was not in what would be called first-rate condition; the gas was bad, and a few other minor matters interfered with the arrangements, and, taking it altogether, it was in bad condition for experiments. The feeding apparatus is simple in construction. The main tank contains about four and one-half barrels of crude oil, which is pumped in by a hand-pump at present. It stands about a hundred yards from the furnace stack, and the oil is conveyed to the tuyeres by an inch gas pipe, where, by a series of valves and pipes, it becomes incorporated with superheated steam before entering the crucible. It passes into the tuyeres through the gate of the blowpipe, about an inch above the plug hole, and has a capacity of from ten to one hundred gallons of liquid an hour to each tuyere. * * * Looking through the glass in the gate we saw a beautiful volume of white flame, having all the appearance of a pure hydro-carbon. The flame moved with a very rapid motion, a motion that would seem to melt anything with which it came in contact. The volume ignited almost immediately after striking the blast in the blowpipe. The two volumes, one of superheated steam and the other of oil, becoming one volume, and that volume burning, proves to any one having the least knowledge of chemistry that the burning volume is a pure bicarburet of hydrogen, which proves beyond a doubt that no water is transmitted into the crucible of the furnace by the oil. That crude petroleum is a disphosphorizer is admitted by all, and that the oil improved the gases of the furnace is another admitted fact, and we see no reason why the discovery of Mr. Robertson should not be utilized by all blast-furnace owners in this valley.

TO COMPUTE HORSE-POWER.—First find the average pressure on each square inch of the piston; multiply this by the number of square inches in the piston, and by the number of feet traveled by the piston per minute, then divide this product by 33,000. The quotient will represent the number of horse-power at which the piston is working. This rule is simple enough to apply, but the difficulty is how to find the average pressure. An indicator applied to each end of the cylinder while working would give a card from which the average pressure may easily be obtained. Without an indicator, the average pressure may be found by the following rule: Let L = stroke of piston in inches; l = piston travel in inches to cut-off; $R = \text{ratio} = \frac{L}{l}$; H = hyperbolic log of R; P = initial pressure of steam in pounds per square inch; p = mean or average pressure in pounds per square inch.

$$\text{Thus } p = P\frac{1+H}{R}$$

But this calculation involves the factor of the initial pressure—that is, the pressure that starts the piston, and this must be ascertained by some means. A sensitive spring gauge applied to the cylinder while working might show it near enough for ordinary purposes; and the point of cut-off can be obtained by measurement while the engine is slowly turned, observing the valve's and piston's motion—having removed the steam-chest cover for that purpose—and turning the engine around by hand.—*Manufacturer and Builder.*

DESCRIBING LINES ON BRIGHT SURFACES.—Many workmen find it somewhat difficult to describe the pattern of work upon iron or steel, especially after the surface is finished. Yet it is necessary to have an outline of the intended form. For instance, if the pattern of a hammer for a revolver be required to be made on a piece of iron or steel that has been faced down, the general practice would be to drill the hole for the screw or pin on which it turns, then fasten the pattern to the work by driving a piece of wire in the hole, and with a scriber mark around the pattern, which is then removed and the work filed away to this line. To obtain a more permanent line and one that will show very distinctly in all its tracings, coat the surface on which the line is to be made with a film of copper. To do this take a lump of sulphate of copper, sometimes called bluestone, wet it with water and rub over the bright surface of the work. The moisture will dry in a few minutes, when the pattern may be put in place and the outline described. The line will be clear and show very distinctly through the copper surface. Three or four light rubs with the sulphate are sufficient to produce this surface, which is so very thin that it may be easily removed, when the work is done, with a fine file, or by rubbing with a bit of emery cloth.—*Blacksmith and Wheelwright.*

RULES FOR FINDING THE HEATING SURFACE OF VERTICAL TUBULAR BOILERS.—Multiply the circumference of the fire-box in inches by its height above the grate in inches; multiply the combined circumference of all the tubes in inches by their length in inches, and to the sum of these two products add the area of the lower tube or crown sheet. Divide by 144, and from the quotient subtract the combined area of all the tubes, and the fire door. The remainder will be the number of square feet of heating surface.

SCIENTIFIC PROGRESS.

Improvement in the Construction of Steam Injectors.

Some substantial advances in the construction of steam injectors are reported to have been made by Mr. J. H. Irwin, who has announced certain rules and formulæ for the proportions of the parts of this useful apparatus, and who has embodied the same in an apparatus which has lately been demonstrated by the tests of a committee of the Franklin Institute to be capable of yielding results of a very superior character. The last trials of this apparatus were of the most thorough and exhaustive character, and furnish in themselves a model for future work of a similar nature. The results announced by the committee are that the information gained in regard to this injector is highly important in the cause of science, and that Mr. Irwin has contributed a valuable improvement in the manner of constructing injectors, increasing their power of augmentation to above twice that of the pressure of steam and for practical working without waste, and to about four times with waste at the overflow, and apparently demonstrating the general law "that the lower the steam employed the higher can the proportional augmentation of pressure be carried."

The remarkable thing about this apparatus—and that which gives an air of strong probability to the claim of Mr. Irwin that he has discovered a law of universal applicability relative to the proportions of the parts of the injector—is the fact that the apparatus, as shown by the committee's test, adapts itself to a great variety of conditions. Thus, the experiments ranged from 105 pounds pressure to 15 inches vacuum, the instrument still working; an augmented pressure of 330 pounds was gained with 90 pounds of steam, and at 10 inches of vacuum an augmented pressure of 10 pounds was gained; feed at 122° Fahr. was lifted 19 inches, and forced by 30 pounds of steam against an equal pressure; water was lifted 21 feet by 40 pounds steam, and forced against 60 pounds; and many other tests were made with "the same instrument without a particle of change or alteration."

The law governing the economical action of injectors, as enumerated by Mr. Irwin requires the employment of certain angles and set dimensions of the interior working parts, of which the following are the most important:

Taking the lesser diameter of the combining cone as the standard of measurement of the instrument, and calling it 1, the larger diameter and length of combining cone will be 4, the diameter and length of jet opening in steam cone will be 2, the smaller diameter of receiving cone will be 1, its larger diameter 2, its length 16, and the diameter of the starting steam jet 0.5. The water supply pipe and overflow are set at an angle of 45° to the axis of the instrument, which is claimed to materially increase its power of augmentation.

We cannot do more here than simply present the general features of Mr. Irwin's important invention, and the general tenor of the committee's report. For details in full, we refer our readers to the *Journal of the Franklin Institute.*

USEFUL APPLICATION OF THE TELEPHONE.—The telephone has been found by Herr Niemoller capable of determining very quickly and accurately the resistance of liquids. It is substituted for the galvanometer in a galvanic bridge, and an induction current is used; then, if the resistances compared are a large liquid resistance on the one hand, and a Siemens resistance box on the other, so that the electrodynamic constants of the branches are very small; if, further, a German silver or platinum wire be used as measuring wire, it is found that in the position where the galvanometer shows no deflection, the tone in the telephone has a well-marked minimum of intensity. Supposing the liquid resistance has 2,000 units, a variation of even four units reveals itself in a displacement of the minimum position. A connection was made, a few weeks since by telephone between Plymouth church (Beecher's), Brooklyn, and the towns of Orange, Newark and Elizabeth in New Jersey, also several points in New York city, at each and all of which Beecher's sermon and the music were both heard. The transmitter was placed in front and below the pulpit. The furthest point was 17 miles distant.

AN ingenious method of measuring the quantity of moisture in the air has been devised by Herr Rudorff, who lately announced it to the German Chemical Society. It consists in admitting to a measured volume of air, contained in a suitable glass chamber, a small quantity of sulphuric acid from a graduated tube with stop-cock. The acid absorbs all the aqueous vapor contained in the air, thereby reducing the pressure in the chamber. This diminution of pressure is shown by means of a manometer connected with the vessel. Sulphuric acid is then admitted in drops until the original pressure is restored. The absorbed aqueous vapor is thus replaced by an equal volume of sulphuric acid, and by calculation the percentage of vapor that the air had carried can be readily ascertained. The method is said to give very accurate results, and the operation makes a good lecture experiment.

Cupellation Shown with the Lantern.

A lantern for the oxyhydrogen light has been devised by Mr. D. S. Holman, of the Franklin Institute, which possesses a number of advantageous features. According to the description given of this convenient adjunct of the lecture-room, it may be converted into a vertical lantern for showing precipitations, the action of a magnet on iron filings, and kindred experiments, and with equal facility may be changed into a projecting microscope, or into a megascope, for showing solid objects on the screen greatly enlarged. In the course of some lectures lately delivered before the Institute, by Mr. A. E. Outerbridge, Jr., of the U. S. Mint, on the subject of "Coins and Coinage," the highly interesting and novel experiment was performed of showing to a large audience, by means of the convenient apparatus just named, the cupellation of gold and silver, as performed in the assaying of the precious metals.

A "cupel" was held in the focus of the light from the condensing lenses of the lantern, by means of a ring of copper wire, greatly enlarged image of the same appearing on the screen. The cupel was then highly heated by means of the oxyhydrogen blow-pipe, and a weighed sample of the gold alloy, containing base metal inclosed in an envelope of lead, was then dropped into the white-hot cupel. As the oxidation of the lead and the absorption of the oxide progressed, it formed a dark ring in the bottom. "A little sheet of light was noticed moving over the surface of the molten metal as the non-oxidizable precious metal became exposed to view; then, at the moment that the lead was completely absorbed, carrying with it all the base metal originally contained in the alloy, the purified precious metal became visible as a brilliant globule, reflecting the light falling on its surface like a mirror."

The Electric Light in Factories.

Although the electric light has not yet come into use for domestic purposes, its success for lighting large spaces, such as depots and factories seems assured beyond question. The Riverside worsted mills, at Providence, R. I., have used the light for over a year, with an estimated economy of $14,000 over gaslight. Five dynamo-electric machines with 80 lamps are employed, lighting all of the principal rooms. An extract from the report of the Treasurer of the company is as follows:

They could not have a severer test than we give them, as our mill runs night and day the year through, and we have not had a moment's delay from, or a dollar's worth of repairs on, any of the machines or lamps. The light is all we expected. It is strong and steady, clear and white. It is universally liked by both overseers and helps—so much so that we doubt if we could get along now with the helps if we were to return to the old gas lighting. Certainly we should not get so good work, nor so much of it. We use porcelain globes pretty generally throughout the mill, and we have less complaint of trouble to the eyes than we used to have with gas. The air of the rooms, too, shows a marked difference. In our weaving-room, with its 250 gas-lights, the air became almost unbearable after midnight in summer, and the faded appearance of the men showed how they felt it. With the electric light there is no such trouble, as the air at night is as good as in the day time, and noticeably cooler. The 80 electric lamps take the place of 578 gas burners and effect a saving in cost of $4.73 an hour, or $14,000 a year, as stated above.

PHONEIDOSCOPE.—M. Guebhard describes a method of projecting the colored rings which are produced on the surface of mercury by the breath or by a drop of volatile liquid. He also obtains membraneous rings by substituting a drop of collodion or of varnish for the volatile liquid. These rings may be fixed upon a card and preserved indefinitely. Phoneidoscope figures may be obtained by pronouncing different sounds so that the breath may be intercepted by the mercurial surface.—*Soc. Franc. de Phys.*

THE COMING COMET.—Star-gazers are anxiously scanning the northern skies in anticipation of the coming comet, which has already been seen in the southern hemisphere, and which may make its appearance in the north at any moment. This comet is supposed to be the reappearance of the famous comet of 1843, which blazed out at that time with a most intense brilliancy.

BONE GLASS.—After extracting phosphorus from bones, a glass can be formed from the residue, which consists of lime and phosphoric acid; the ordinary kinds of glass being composed of sand and potash, soda, lime and alumina. Bone glass can be worked as readily as any other glass. It has the valuable property of not being attacked by fluoric acid.—*Les Mondes.*

PHOTOGRAPHS OF THE MOON.—Mr. George Berwick, it is stated, has taken a series of photographs of the moon on very sensitive plate—the bromo-gelatins. One of the plates shows three well-defined rings around the moon. Whether the rings are due to cosmical, atmospheric, chemical or optical causes has not been determined.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 8.		Week Ending Apr. 15.		Week Ending Apr. 22.		Week Ending Apr. 29.	
Alpha	7	6½	7	6	7	6½	7	6½
Alta	2.60	2½	2.90	2.40	3.30	2.85	3	2½
Andes	90c	75c	1½	95c	1.30	95c	1	75c
Alps	....	....	....	....	....	....	....	....
Argenta	65c	55c	65c	50c	55c	45c	50c	35c
Atlantic	....	....	....	....	10c	....	....	....
Aurora Tunnel	....	....	45c	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	3½	2½	2.95	2 15	3	2.40	2.60	1.45
Belmont	35c	15c	40c	35c	40c	30c	55c	40c
Best & Belcher	9½	8½	13½	8½	12½	10½	11	8½
Bullion	3½	2.70	3.40	2½	3.35	2.80	3½	2½
Bechtel	2	1½	1.80	1.60	1½	....	1.60	90c
Belle Isle	1.05	60c	75c	60c	65c	50c	50c	....
Bodie	9¼	8½	9	7½	8½	8½	8½	7⅞
Benton	2.20	1.35	2	1.65	2½	1.80	1.80	1.20
Bulwer	9½	7½	6⅞	5½	6½	6½	6½	5½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	80c	70c	75c	65c	1	70c	90c	75c
Belvidere	3½	2½	3½	2.60	3¼	3.05	3.30	2½
Bookcr	60c	50c	50c	45c	50c	45c	40c	30c
Caledonia	1	80c	90c	60c	95c	85c	80c	50c
California	2½	2½	2.90	2½	2.50	2.20	2.30	2.45
Challenge	1.55	1½	1½	1½	1.85	1.65	1.85	1.45
Choller	5½	5	5½	4.60	5	4½	4.80	3.90
Confidence	6	5½	6½	4½	6½	6½	6½	5½
Con Imperial	45c	35c	50c	35c	45c	40c	40c	30c
Con Virginia	3.05	2.65	3½	2.55	3⅜	3.20	3½	2.80
Crown Point	2.45	1.80	2½	1½	2½	1.95	2.10	1.70
Con Washoe	....	....	....	....	....	....	....	....
Champion	1½	75c	1	85c	1.10	90c	90c	70c
Concordia	1½	80c	1.10	1	1.20	1.05	1	60c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	90c	80c	1.16	75c	95c	85c	90c	55c
Eureka Con	20½	18½	19	18	19½	18½	20	19½
Exchequer	2.60	2½	2.80	2.15	2.70	2.40	2.65	2.05
Endowment	30c	25c	30c	....	30c	25c	30c	25c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1.40	90c	95c	70c	95c	75c	85c	60c
Gila	....	....	20c	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodshaw	40c	25c	35c	30c	35c	30c	30c	25c
Gould & Curry	4½	4.10	5½	4	5½	5	5½	3½
Hale & Norcross	5½	4.80	5½	4.60	5½	5	4.95	3½
Hillside	75c	60c	75c	60c	30c	25c	35c	....
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	1	90c	....	....	....	....	1.50	30c
Julia	1.45	80c	1.35	1.05	1.35	1.10	1.20	75c
Justice	1.55	1½	1½	1.15	2.05	1½	1.65	1
Jackson	4	3	3	....	4	3	4	3½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	4½	3.95	3½	....	4	....	4	....
Kentuck	3	2½	....	....	3	2.90	2½	2
Kossuth	....	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	20c	15c	....	....	20c	....	....	....
Lady Wash	65c	50c	60c	55c	70c	55c	60c	40c
Leopard	10c	....	....	....	....	....	5c	....
Leviathan	35c	30c	30c	25c	35c	20c	35c	30c
Leeds	30c	....	30c	25c	25c	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	20c	15c	....	25c	15c	25c	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1.05	1	1	....	1	....	1	....
Martin White	35c	25c	50c	40c	35c	25c	90c	60c
McClinton	80c	60c	70c	55c	60c	50c	60c	50c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	13½	10	10½	9½	10½	10	10½	6½
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	30c	15c	25c	15c	25c	20c	20c	15c
Northern Belle	18	17½	17½	16	15½	13	14½	11½
New Coso	....	....	....	....	....	....	....	....
Navajo	35c	25c	40c	30c	40c	25c	35c	25c
Occidental	1½	70c	2.60	1.30	2.05	1½	1.60	1
Ophir	15½	11½	11	9½	10½	10½	10½	6½
Oriental	60c	....	....	....	....	....	....	....
Overman	2	1.10	1.65	1½	1.55	1.40	1½	85c
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	2	....	....	....	....	....
Phil Sheridan	....	....	....	....	....	....	15c	10c
Potosi	3.85	2.90	3½	2½	3.70	3.60	3.60	2½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	60c	35c	35c	25c	30c	25c	25c	5c
Richer	....	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	5	3.95	4.35	3.55	4½	3.95	3.95	2½
Seg Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	20	15½	16½	14½	16	15	15½	8½
Silver Hill	70c	55c	65c	55c	75c	60c	60c	30c
Silver King	5	....	5	4½	5	4½	5	4.90
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	1½	1.10	1.15	1	1.10	1	1.10	1
Scorpion	2.80	2½	2.60	2½	2½	2.15	2½	1.10
Solid Silver	....	....	15c	....	10c	....	....	....
South Bodie	50c	40c	35c	....	30c	....	....	....
South Standard	20c	15c	10c	....	....	....	....	....
Star	25c	....	25c	....	25c	....	30c	25c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1.40	1	1½	1.40	1.40	1.20	1.30	1.20
Tioga Con	2.60	2	2.05	2	2	1.90	2.10	2
Tiptop	4½	4	5	....	6	5	7½	6½
Trojan	10c	....	....	....	....	....	....	....
Union Con	33½	26	28½	25	26	24½	26	18
Utah	10½	8½	11	8½	12½	9½	10	6½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.65	1½	2½	1.65	2½	2	2.10	1½
Wells-Fargo	5c	....	....	....	....	....	....	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	7½	6⅞	7½	6½	7½	7½	7½	5½

Sales at S. F. Stock Exchange.

Friday A. M., Apr. 23.

10 Alta 3
10 Alpha ..... 6¢
710 Andes ..... 95c@1
210 Belcher 2.80
525 Bullion ..... 3@2.90
280 Best & Belcher ..... 10½@10⅝
400 Benton ..... 1¢
340 California 2.60
160 Con Virginia 3.35
50 Challenge 1.30
100 Caledonia 85c
300 Con Imperial 40c
190 Crown Point ..... 2.10@2.05
150 C Dorado ..... 1.40@1.45
170 Exchequer ..... 2½@2.55
100 Essex ..... 2¢@2.10
100 Fairfax 40c
95 Gould & Curry ..... 5½@5⅝
435 Hale & Nor ..... 4.90@4.95
230 Julia 1.15
55 Justice ..... 1.65@1.60
20 Kentuck 2½
140 Mexican ..... 10½@10⅝
600 Mackay ..... 10¢
335 N Bonanza 40c
300 New York ..... 18½@19
145 Ophir ..... 10½@10⅝
185 Overman ..... 1.40@1.45
100 Occidental 1½
5 Potosi 3.60
50 Phil Sheridan ..... 10¢
420 Silver Hill 60c
40 Savage ..... 3.90@4.95
10 Sierra Nevada 15½
125 Scorpion 2
125 Union Con ..... 24½@24¾
100 Ward 2.10
80 Yellow Jacket 7½

AFTERNOON SESSION.

300 Addenda 80c
500 Argenta 50c
450 Albion ..... 60@65c
900 Belmont ..... 40@45c
100 Boston ..... 1.10@1.15
165 Belvidere 3½
250 Black Hawk ..... 90¢
100 Bodie 8½
20 Bechtel 1.55
1020 Champion ..... 70@90c
110 Caledonia (B H) 2½
190 C Pacific 3½
300 Day ..... 2@2.90
850 D Standard ..... 60@65c
60 Eureka Con 19½
100 Goodshaw 30c
650 Grand Prize ..... 70@75c
50 Gipsy Queen 30c
100 Independence 45c
10 Mt Diablo 19
550 McClinton ..... 50@60c
170 Mt Potosi 1
100 M White 85c
120 Mammoth 2.40
50 Noonday 4½
20 N Noonday 5½
100 N Belle Is 25c
150 Northern Belle 14½
300 Navajo ..... 30@25c
200 Oro ..... 4.80@4.90
200 Queen Bee 45c
660 Raymond & E 25c
50 Summit 1.10
1000 S Bulwer 50c
50 Silver King 5
600 University 30c

Saturday A. M., Apr. 24.

25 Alta 2.90
25 Andes ..... 95c@1
200 Alhuco 65c
100 Argenta 45c
115 Addenda 80c
10 Booker 35c
30 Bulwer ..... 6¢
100 Belmont 35c
100 Boston 1.10
10 Bodie 8
100 Belcher 2½
510 Best & Belcher ..... 10½@11
470 Bullion ..... 2.85@2.90
150 Benton ..... 1.80@1.82
190 Black Hawk ..... 90@85c
25 Belvidere 3½
120 California ..... 2.80@2.85
120 Chollar 4.80
460 Con Virginia ..... 3½@3.40
50 Crown Point 2.05
120 Confidence 6½
55 Caledonia 80c
30 Challenge 1.85
355 C Dorado 1.35
20 C Pacific 3½
150 Champion ..... 90@85c
25 Concordia 90c
40 Exchequer 2.65
100 Essex 2.10
150 Endowment 25c
80 Eureka Con 20
400 Flowery 10c
80 Gould & Curry 5½
200 Golden Gate 30c
530 Grand Prize ..... 75@75c
120 H & Norcross ..... 4.80@4½
30 Justice 1.60
30 Julia 1.15
150 Jackson 4
285 Mexican ..... 10@10½
350 New York 20c
925 N Bonanza ..... 45@36c
50 N Noonday 5½
40 Overman 1.60
135 Ophir ..... 10¼@10½
50 Occidental 1.60
150 Oro ..... 4½@4.85
190 Potosi 3.60
250 Paradise 6½
100 Raymond & Ely 25c
50 Real del Monte 1.40
25 Red Cloud 40c
200 Silver Hill ..... 55@60c
150 Scorpion 2½
100 S Bulwer 50c
100 Sierra Nevada ..... 15½@15⅝
80 Savage ..... 3.85@3.80
50 Syndicate 1.30
100 Tiptop 6⅝
235 Tioga Con ..... 2@2.10
85 Union Con 26½
150 Utah 10½
20 University ..... 30@25c
140 Ward ..... 2.05@2.10
95 Yellow Jacket ..... 7¼@7¾

Monday A. M., Apr. 26.

100 Alta 2.60
100 Andes 1
30 Alpha 7
960 Belcher ..... 2.40@2½
210 Benton 1½
445 Bullion 2.80
310 Best & Belcher 10⅝
60 California 2.65
220 Challenge 1.70
10 Caledonia 80c
45 Confidence 6½
235 Crown Point ..... 2.05@2.10
430 Con Virginia ..... 3.40@3.46
40 Chollar 4½
50 Essex ..... 2¢
165 Exchequer ..... 2½@2.65
430 Gould & Curry ..... 5½@5⅝
530 Julia ..... 1.15@1.20
200 Justice ..... 1½@1.55
50 Leviathan 35c
550 Mackay 10c
20 Mexican 9½
470 N Bonanza ..... 40@35c
100 Occidental 1½
200 Overman ..... 1½@1.35
245 Ophir ..... 9¼@9½
140 Potosi 3.60
45 Savage 3.60
185 Scorpion 2½
1300 Silver Hill ..... 55@50c
150 Sierra Nevada 15½
10 Utah 9½
365 Union Con ..... 25@25½
235 Yellow Jacket 7

AFTERNOON SESSION.

300 Addenda 95c
300 Albion 70c
195 Argenta 40c
200 Belvidere 3½
70 Bodie 8
40 Bechtel 1.60
110 Bulwer ..... 6@6½
160 Boston 1.10
300 Black Hawk 85c
210 Belle Isle 50c
250 Belmont 55c
450 Champion ..... 85@90c
250 Concordia ..... 95c@1
85 C Pacific 3½
170 Day ..... 80@90c
300 D Standard 60c
95 E Mt Diablo ..... 60@70c
100 Endowment 30c
50 Goodshaw 30c
600 Grand Prize 80c
200 Holmes 50c
100 Independence 40c
30 Jackson 3½
50 Jupiter 4½
215 Mammoth ..... 2.20@2½
10 Mt Diablo 18
95 Mt Potosi 1
100 McClinton 65c
500 May Belle 25c
250 M White 85c
90 Manhattan 1
450 Navajo 35c
365 Northern Belle ..... 13½@13
30 Noonday 4½
125 Oro 4.85
230 Paradise ..... 55@40c
200 Queen Bee 40c
100 S Bulwer 45c
500 Silver King 4.90
500 Syndicate 1½
50 Star 30c
1250 Tiptop 7
150 University 30c
30 Wales 3.05

Tuesday A. M., Apr. 27.

415 Alta ..... 2½@2.10
1295 Andes ..... 75@90c
25 Alpha 7
350 Belcher ..... 2@2.05
420 Benton ..... 1.20@1.30
1485 Bullion ..... 3@2²
885 Best & Belcher ..... 9¾@9½
310 California ..... 2½@2.55
340 Con Virginia ..... 3.10@3.15
265 Caledonia ..... 50@60c
195 Confidence ..... 5½@6
1220 Con Imperial ..... 30@35c
150 Crown Point ..... 1½@1.85
380 Chollar ..... 4½@3.90
110 Exchequer ..... 2.20@2.30
50 Flowery 10c
795 Gould & Curry ..... 3½@4.10
190 H & Norcross ..... 4.95@4
460 Julia ..... 75@90c
120 Justice ..... 1.30@1.35
50 Kentuck 2½
200 Leviathan 30c
50 Lady Wash 60c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Apr. 22. Thursd'y A. M., Apr. 29.

50	Andes 1.30	20	Alpha ..... 6¢
100	Alta ..... 2½@2.60	100	Andes ..... 85c@90c
965	Bullion ..... 3@2.80	345	Alta ..... 2.05@2
60	Benton ..... 1.80@1.90	415	Best & Belcher 8½
495	B & Belcher ..... 10⅜@10⅝	830	Belcher ..... 1.70@1.45
100	Con Imperial 40c	275	Benton 1.20
240	Crown Point ..... 2.10@2	600	Bullion ..... 3.30@3
100	California 2.80	190	California ..... 4.30@4½
200	Con Virginia ..... 3½@3.30	110	California ..... 2.45@2½
40	Chollar 4½	600	Con Virginia ..... 2.95@2.90
20	Caledonia 85c	160	Crown Point 1.90
140	C Dorado 1.30	300	Con Imperial ..... 30@35c
155	Exchequer ..... 2.40@2½	10	Confidence 5½
50	Essex 1.90	65	Challenge 1½
365	Gould & Curry 5½	150	Caledonia 65c
100	Golden Gate 20c	350	C Dorado 1.10
80	Hale & Nor 5	200	Exchequer ..... 2.05@2.10
595	Mexican ..... 7½@7¾		
1175	Mackey 10c		
600	N Bonanza ..... 30@35c		
50	New York 15c		
260	Occidental ..... 1@1.10		
915	Overman ..... 85c@1		
675	Ophir ..... 7½@8		
120	Phil Sheridan 10c		
230	Utah ..... 8½@8¾		
645	Union Con ..... 24@23½		
200	Ward 1.90		
360	Yellow Jacket ..... 6½@5½		

AFTERNOON SESSION.

725	Addenda ..... 95c@90c	515	Justice ..... 1.65@1½
1220	Albion ..... 60@50c	50	Julia 1.15
550	Argenta 40c	40	Lady Wash 60c
100	Belding 50c	60	Leviathan 35c
120	Bodie 8½	500	Mackey 10c
230	Utah ..... 8½@8¾	165	Mexican ..... 7½@7¾
645	Union Con ..... 24@23½	80	Mexican ..... 7½@7¾
200	Ward 1.90	455	Gould & Curry ..... 3.85@3.80
360	Yellow Jacket ..... 6½@5½	150	Golden Gate 15c
725	Addenda ..... 95c@90c	165	Hale & Nor ..... 5@4.85
1220	Albion ..... 60@50c	375	Julia ..... 80@85c
550	Argenta 40c	200	Justice ..... 1.10@1
200	Belvidere ..... 3.30@3	80	Kentuck ..... 2½@2
830	Champion ..... 75@80c	195	Lady Wash ..... 45@40c
300	Concordia ..... 60@70c	595	Mexican ..... 7@6½
300	Caledonia (B H) 2½	50	Mackey 10c
90	C Pacific 3½	950	Mexican ..... 7@7½
345	Dudley ..... 75@70c	70	N Bonanza 40c
500	D Standard 50c	550	New York 16c
540	E M Diablo ..... 55@70c	65	Occidental 1.16
270	Eureka Con 20	110	Overman ..... 1.05@1.10
300	Endowment 30c	685	Ophir ..... 6¾@7½
500	Grand Prize ..... 60@65c	100	Phil Sheridan 15c
1590	Goodshaw ..... 30@25c	830	Potosi ..... 3@3.15
400	Holmes 50c	300	Silver Hill ..... 40@35c
100	Hillside 35c	865	Sierra Nevada ..... 10½@10⅝
200	Jackson ..... 3½@3½	745	Scorpion ..... 1½@1.45
120	Jupiter ..... 1½@1.40	50	Trojan 10c
150	Mackey 10c	375	Utah ..... 7¼@7⅜
950	Mexican ..... 7@7½	580	Union Con ..... 20@23½
70	N Bonanza 40c	240	Ward 1.60
550	New York 16c	550	Yellow Jacket ..... 5½@5⅝

AFTERNOON SESSION.

120	Addenda 90c	100	Essex 1½
1050	Argenta ..... 40@35c	150	Flowery 10c
700	Albion ..... 50@45c	455	Gould & Curry ..... 3.85@3.80
100	Belmont 45c	150	Golden Gate 15c
170	Bulwer ..... 5½@5¾	165	Hale & Nor ..... 5@4.85
65	Bodie ..... 7½@7⅝	375	Julia ..... 80@85c
150	Boston 1	200	Justice ..... 1.10@1
150	Booker ..... 35@40c	80	Kentuck ..... 2½@2
100	Belvidere 2½	195	Lady Wash ..... 45@40c
290	Champion ..... 75@80c	595	Mexican ..... 7@6½
1050	Concordia ..... 90c@1	50	Mackey 10c
100	Caledonia (B H) 2.60	950	Mexican ..... 7@7½
550	C Pacific 3½	70	N Bonanza 40c
800	Day ..... 55@65c	550	New York 16c
600	D Standard 50c	65	Occidental ..... 1.15@1.10
50	Eureka Con 20	200	Overman ..... 1.05@1
300	Endowment 30c	130	Potosi ..... 3.10@3
1590	Goodshaw ..... 30@25c	100	Phil Sheridan 10c
300	Grand Prize 80c	105	Savage 2½
1750	Hillside 30c	875	Sierra Nevada ..... 9½@9¾
85	Independence ..... 40@30c	345	Scorpion ..... 1½@1.10
30	Jupiter 1.35	1000	Silver Hill ..... 36@35c
160	K K Con 4	580	Union Con ..... 18@18¾
100	Leopard 5c	195	Utah ..... 6½@6¾
300	May Belle 25c	165	Ward 1½
100	Mammoth 2½	335	Yellow Jacket ..... 5½@5⅝
100	McClinton 50c		AFTERNOON SESSION.
80	Martin White 90c	470	Argenta 15c
75	Metallic 1.10	350	Albion ..... 50@55c
235	Mono 6½	320	Addenda 95c
585	N Belle Is 25c	130	Bodie ..... 7½@7¾
300	Noonday 4½	200	Bechtel 1.30
50	N Noonday 6½	100	Boston 90c
100	Oro 4½	160	Belvidere 2½
125	Paradise 40c	100	Booker 90c
350	Red Cloud ..... 10@60c	190	Black Hawk ..... 55@60c
150	Raymond & E ..... 5@10c	600	Belmont 35c
400	Syndicate ..... 1½@1.20	150	Concordia 80c
545	Summit 1	200	Caledonia (B H) 2.65
100	S Bulwer ..... 45@50c	350	Goodshaw 30c
100	S Noonday 1.40	500	Hillside 30c
10	Tioga 2	300	Jupiter 1½
30	Tiptop 7	40	K K Con 4½
300	University 30c	100	Leopard 5c
200	Wales ..... 3@3.10	50	Belvidere 3.20

50	Gipsy Queen 80c	300	Paradise 40c
150	Jackson 3½	350	Queen Bee ..... 36@30c
250	Mt Potosi 1	425	Red Cloud ..... 60@50c
75	Mono 6½	655	Raymond & Ely ..... 6@10c
40	Martin White 85c	100	Star 25c
200	Mammoth ..... 2.35@2.40	100	Syndicate 1.10
180	Noonday 4.15	100	S Noonday 1.40
100	Oro 4½	150	S Bulwer 35c
60	Phenix 2	200	Silver King 4½
120	Raymond & Ely ..... 25@30c	155	Summit 1
650	S Bulwer 60c	150	Tiptop 6½
100	Tioga Con 1.90	200	Tioga Con 2
300	Tiptop 6	230	University ..... 30@26c
400	University 30c	260	Wales 3

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	3	20	Mar 25	Apr 30	May 21	T H Dixon	328 Montgomery st
Alta S M Co	Nevada	17	50	Apr 5	May 10	May 31	W H Watson	302 Montgomery st
Argenta M Co	Nevada	6	25	Apr 28	June 2	June 22	E M Hall	327 Pine st
Belmont M Co	Nevada	23	20	Mar 3	Apr 8	May 5	J W Pew	310 Pine st
Belvidere M Co	California	6	50	Mar 4	Apr 6	May 1	C V D Hubbard	203 Bush st
Belcher S M Co	Nevada	22	75	Apr 2	May 6	May 27	J Crockett	203 Bush st
Benton Con M Co	Nevada	3	50	Apr 2	May 7	May 25	W H Watson	302 Montgomery st
Bullion M Co	Nevada	14	1 00	Mar 25	Apr 28	May 18	J M Brazill	Safe Deposit build'g
Commonwealth Con M Co	Nevada	2	10	Mar 24	Apr 26	May 13	C A Morse	217 Sansome st
Con Pacific M Co	California	1	1 00	Mar 13	Apr 16	May 8	F E Luty	330 Pine st
Day S M Co	Nevada	5	05	Mar 2	Apr 6	May 3	J F Pew	310 Pine st
Dudley M Co	California	2	25	Apr 20	May 24	June 22	E O Masten	309 Montgomery st
Equitable T & M Co	Utah	22	10	Mar 22	Apr 30	May 25	C J Collins	227 Montgomery st
Gila S M Co	Nevada	7	25	Apr 20	May 24	June 14	W W Parrish	330 Pine st
Independence M Co	Nevada	6	25	Apr 19	May 25	June 14	E M Hall	327 Pine st
Jupiter M Co	California	3	40	Mar 31	May 4	June 2	E O Masten	309 Montgomery st
Leopard M Co	Nevada	15	10	Apr 5	May 7	May 28	E M Hall	327 Pine st
Mexican G & S M Co	Nevada	11	1 00	Apr 28	June 1	June 21	C L McCoy	203 Bush st
Mammoth M Co	California	4	1 00	Feb 18	Apr 24	May 21	A W Rose	302 Montgomery st
Martin White M Co	Nevada	6	50	Mar 22	Apr 28	May 20	J J Scoville	309 Montgomery st
Mackey G & S M Co	Nevada	3	10	Apr 25	June 1	June 21	J M Buffington	309 California st
Modoc Con M Co		9	1 50	Mar 18	Apr 26	May 17	J W Pew	310 Pine st
Mono G M Co	California	7	1 00	Mar 9	Apr 13	May 4	W H Lent	309 Montgomery st
Monte Christo Con M Co	California	3	10	Mar 19	May 8	June 3	B Burris	309 Montgomery st
Navajo M Co	Nevada	6	10	Mar 22	Apr 23	May 14	E M Hall	327 Pine st
North Bonanza M Co	Nevada	5	25	Mar 20	Apr 24	May 18	W W Stetson	309 Montgomery st
Occidental M Co	Nevada	6	50	Mar 9	Apr 12	May 3	A K Durbrow	309 Montgomery st
Ophir S M Co	Nevada	35	1 00	Apr 10	May 13	June 3	C L McCoy	203 Bush st
Overman S M Co	Nevada	45	50	Apr 6	May 12	June 2	G D Edwards	414 California st
Raymond & Ely M Co	Nevada	14	25	Apr 5	May 10	June 7	W L Elliott	328 Montgomery st
Real Del Monte M Co	Nevada	10	50	Mar 4	Apr 10	May 8	C V D Hubbard	203 Bush st
Savage M Co	Nevada	42	1 00	Apr 3	May 6	May 26	——	309 Montgomery st
Scorpion G M Co	Nevada	7	40	Apr 28	June 7	June 30	Geo R Spinney	310 Pine st
Solid Silver G & S M Co	Nevada	3	25	Apr 13	May 15	June 5	R Newson	320 Sansome st
South Bodie G M Co	California	3	15	Apr 8	May 12	June 2	H Deas	309 Montgomery st
South Bulwer G M Co	California	7	50	Apr 2	May 5	May 27	W Stuart	320 Sansome st
Utah G M Co	Nevada	30	2 00	Apr 28	June 2	June 22	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Argonaut M & M Co	California	3	1 00	Mar 30	May 1	May 24	J L Fields	240 Montgomery st
Atlanta M Co	Utah	1	05	Dec 23	Apr 29	May 24	A F McGrew	420 Montgomery st
Blackhawk G M Co	California	3	25	Mar 17	May 13	June 3	F W Charles	419 California st
Black Rock M Co	California	3	15	Apr 2	May 21	June 21	N T Root	225 Beale st
Eintracht G M Co	California	3	1 00	Apr 13	May 15	June 1	H King	320 Sansome st
Esta Buena Con S M Co	California	6	20	Feb 21	Apr 19	May 4	R N Brooks	509 Sacramento st
Excelsior Deep Gravel M Co	California	10	10	Apr 21	May 24	June 15	D F Verdenal	327 Pine st
Fairfax M Co	Nevada	2	20	Apr 7	May 10	May 31	O C Miller	324 Pine st
Florida Hill M Co	Idaho	2	10	Feb 25	Apr 7	May 4	R Wegener	414 California st
Gover M & M Co	California	41	10	Mar 8	Apr 12	May 3	W O Wilson	402 Front st
Headlight M Co	California	2	10	Mar 20	Apr 10	May 14	A W Rose	302

200 Con Imperial	.32¢	100 Enterprise	.1¢
75 Crown Point	1.65	10 Exchequer	.2.30
30 Exchequer	.2.40@2.15	100 Goodshaw	.27¢
150 Goodshaw	.27¢	20 Gould & Curry	.4.10
40 Gould & Curry	.4@4.05	100 Gipsy Queen	.80c
75 Gipsy Queen	.80¢	50 Julia	.95c
30 Hale & Nor	.3.85@3.90	20 Kentuck	.2¢
60 Julia	.85@82½¢	150 Lady Wash	.50@52½¢
150 Justice	.1.20@1.15	20 Mexican	.7¢
30 Mexican	.7¢@7¢	150 N Sierra Nevada	.3c
250 N Sierra Nev	.3@3c	10 Occidental	.1.10
20 N Noonday	.6¢	20 Ophir	.7¢@7¢
20 Ophir	.7¢	30 Overman	.1.10@1¢
20 Overman	.1¢	100 Phil Sheridan	.15c
30 Potosi	.2.75	20 Savage	.3
30 Sierra Nevada	.10¢@10	20 Sierra Nevada	.12¢@11
10 Scorpion	.20¢	140 Silver Hill	.40@45c
160 Silver Hill	.40c	10 Utah	.7¢
40 Union	.20¢@21	40 Union	.21¢@20
20 Ward	.1.85@1.90	30 Ward	.1¢
100 W Comstock	.20c	100 W Comstock	.20c
10 Yellow Jacket	.2¢	10 Yellow Jacket	.6

Mining Share Market.

The market for stocks is still dropping, aod it does not seem as if prices could get much lower. The present depression shows how much the stock market was dependent ou the Comstock alone for its animation. On that lode, affairs are at a low ebb, owiog to failure in striking bonanzas. Everywhere else on the coast mining matters are more prosperous and "booming" than ever before. Yet, "stocks are down." The "outside stocks" do not show the depression that those on the famous lode do.

A dispatch from Virginia City, April 28th, says: "A blast in the north-header of the Sntro tunnel, to-day, knocked a hole down into the workings of the 1750-level of Consolidated Virginia, the dirt filling a drift completely on that level. The header will be passed in a day or two, and the 30 men—not 300 as reported—laid off, will be returned. Chollar and Belcher are doing nothing except raising water, but the floods in both places are under control."

It seems rather strange that all the Comstock papers should have annouoced the dischnrge of 300 miners, when it was only 30, and it is no wonder that the announcement created such a sensation.

From all parts of the coast come news of rich discoveries and strikes. Our exchanges are filled with snch notices. Arizona is being very thoronghly prospected, and in a few years will prove np a magnificent mineral country. New Mexico will soon come to the front, no doubt. Colorado is all the go jnst now, and great things are expected of the Gnnnison country, which, it is anticipated, will eclipse Leadville. The deposits are of the same character as those of Leadville, but very much more extensive. People are already flocking in that direction. Idaho also is coming to the front, and will no donbt give a good account of herself in time. California is just now somewhat overlooked, owing to more glittering prospects elsewhere. Nevertheless her miners are making money in a quiet way, without much blnster. The mining boom is increasing rather than declining.

The members of the San Francisco Board raised their commission rates to $1 for each transaction under $200, and one-half of one per cent. on all transactions over $200—to go into effect on Monday next.

Bullion Shipments.*

Since our last issue, we have noticed the fol owing bullion shipments:

Hillside, April 26th, $4,000; Paradise Valley, April 22d, $4,286.57; Paradise Valley, April 24th, $4,590.25; Grand Prize, April 26th, $11,600; Con. Virginia, April 26th, $47,470.64; Union Con., April 26th, $41,350; Christy Con., April 23d, $6,707; Standard Con., April 19th, $22,577.08; Northern Belle, April 19th, $6,185.33; Northern Belle, April 21st, $6,506.27; Northern Belle, April 24th, $8,970.13; Contention (Arizona), April 24th, $11,787.26; Tombstone (Arizona), April 22d, $18,548; Fresno Enterprise, April 27th, $15,000; Hillside, April 28th, $4,000.

*Desiring to make our list of Bullion Shipments as complete as possible, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

ASSESSOR BADLAM and his deputies and clerks are having a busy time of it at present, in order to complete the personal property rolls in June next, as required by the new Revenue law. The roll will be very large, and it is considered probable that the valuation of personal property in this city will exceed last year's valuation hy over $100,000,000.

Resources of Arizona.

In another column we give the first of a series of articles on Arizona, which have been compiled for the PRESS in order to give our readers as full and reliable information concerning that growing Territory as is at present attainable. As we have had to use the testimony of other writers, we can only say we have sought to give our readers the best at command. We intend soon to send a special correspondent to this new and important field, and to furnish every detail concerning the different mining districts and the material resources of the Territory which it is possible to procure. Our correspondent will visit all the mining fields in Arizona and collect such statistics and details as are available. What we now give is somewhat general in its character. So great an interest is manifested in all that relates to the Territory, and especially its mining resources, that we shall spare no trouble to gather and publish such information concerning it as will be of value to our readers.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

OLETA MINES.—Cor. Amador *Ledger*, April 24: The new mines at Oleta have started to work with a small force of men. Another mine is to be opened in that neighborhood this week. Both mines formerly belonged to Figg. Some rich rock has been discovered in sinking. William Coleman, formerly nnder at the Empire, is foreman of this property.

LINCOLN.—Last Friday or Saturday the pump of the Lincoln mine gave out at the 600 level. Upon examination it was found that the valve was out of order. Owing to the unusually heavy rain, the flow of water is very strong.

THE CON. AMADOR is improving. The rock is getting richer as the mine is explored. A large number of hands are kept steadily employed, and the 40-stamp mill is running constantly. A clean-up was made this week that was of a more satisfactory character than for some time past.

THE WILDMAN is tangled up in law, and no telling when a final decision will be reached.

BUTTE.

THE EOCENE TUNNEL & M. CO.—Butte *Register*, April 23: On Friday last the largest mining enterprise in the State was located and recorded in the Yankee Hill mining records. Eleven miles of the North Fork of Feather river bed was taken up for mining purposes by some of the heaviest capitalists of the United States, among whom will be found the names of William H. Vanderbilt, Hon. G. C. Perkins, A. J. Drexel, James C. Logan, G. W. Cummings, Thomas A. Edison, James H. Banker, Hon. P. G. Hundley, Frank McLaughlin and Hon. E. W. McKinstrey. These parties propose to dam the North Fork river at or near the upper end of the Big bend. This will dry the North Fork to the mouth of the West Branch. The waters will be diverted from their natural channel to the West Branch of Feather river by a tunoel. Said tunnel will conduct the water to Dark canyon, which empties into the West Branch 1 mile above the junction of the North Fork and West Branch. This outlet will be 3 miles in length, and consist of 1½ miles of tunnel and 1½ miles of an open cut. The discharge will bo 300 ft lower than the mouth. These 11 miles of the river that will be dried, consist of the richest mining deposits in the world. This project has been talked over for years, but the undertaking was so immense that it was thought capitalists would not engage in it. For years the North Fork has been flumed and wing-damed, and in no instance has it failed to pay well, leaving out misbaps incidental to mining in the river.

YANKEE HILL ITEMS.—Of other mining operations, we can say there bas been a great deal of prospecting, and it has paid well. Williams & Rowe have bonded ther quartz ledge for $20,000, and the parties will take it. Chris. Nate, near this place, has taken out nearly $4,000 in a decomposed ledge. Patterson & Rudd have made big wages this winter at Hump hill, considering the inconvenience of working under ground in such a wet spring. The Big Bar company has washed more ground than they have for years before. The deposit is of the coarser grade of gold. William Pinchoun has been making 3 to 4 ounces per day in old ground. Old Pinchstoun picked up a 21-ounce nugget in Chub gulch. It is a common thing for Mexicans to find nuggets from 2 ounces up to 10 or 12. This part of the county is rich in mines, but poor in capital. There is a prospect of the '49 & '56 company and the Venus quartz company joining and building a 40-stamp mill this coming summer.

CALAVERAS.

GWIN MINE.—Calaveras *Chronicle*, April 24: Additional hoisting works are to be put up at the Gwin mine. Some distance south of the main works is a shaft about 500 ft deep, sunk several years ago. Lately a bonanza has been developed in that portion of the mine and Mr. Gwin has determined to open and sink the shaft above mentioned, as by its use the new ore body south can be rapidly and economically worked. Mr. John Rider, the well-known mechanician and millwright, is to put up the machinery. The new ore body discovered to the south in the Gwin mine is proving both rich and extensive. The mine is paying as well or better now than it did in its palmiest days.

DISASTER AT THE EUREKA.—We learn that the ditch which supplies the Eureka hydraulic with water is broken, and that operations in the mine have been brought to a standstill.

WHISKY SLIDE MINE.—We understand it to be the intention of the Eastern company, now owning the well-known Whisky Slide mine, to put a 20-stamp mill on that property. An agent of the company is now here and members of it will soon follow.

CHAMPION.—There is no diminution of the yield of the Champion. A depth of 600 ft has now been reached, and at that point the ledge is showing even more favorably than anywhere above. To-day the Champion stands as one of the best, most permanent and valuable mine in the State.

WEST POINT ITEMS.—Our mines continue to look good, and our prospects for the future also. I have called at the different mines now working, and find their owners in high glee at their present prospects. Terbur & Co. are taking out splendid quartz on the old Lockwood mine which will assay $80 per ton. I called the other day to have a look at the Lone Star mine. The mine is on the North Fork of the Mokelumne river, where the hills rise on each side over 1,000 ft high. It is at present worked by tunnels, which tap the lode on four different levels. The first, or lower level, being about 150 ft from the bed of the river, is kept running day and night, prospecting along the lode. In the second level they are running a winze on rock that will average $150 a ton, to connect with No 3 level, where they are sinking a winze on very rich rock to connect with the winze of the No. 2 level. I found in every level that the lode looks splendid, full of sulphurets, and prospects big in the "horn." Mr. W. Johnson and R. Smith are taking out rich rock about one-half mile below the Lone Star; likewise Mr. G. and F. Cheek are rolling out bullion in that vicinity. I understand that the old Woodhouse mine is again to be opened, the mine in past years having been very rich. Superintendent Lascy is still running the Hunter's Flat tunnel for gravel.

MARIPOSA.

MARIPOSA G. & S. M. CO.—Mariposa *Gazette*, April 24: This is a new company recently incorporated, and from present appearances there is a fair prospect of its importance to this mining section. Last week Dr. H. H. White, a prominent attache of the above company, exhibited to us quite a quantity of rock taken from the shaft at present being sunk upon the mine, which shows in equal quantities of gold and silver, and without assay appears to predomioate in gold; both, however, are plainly visible, and the rock thoroughly impregnated with the valuable metals. At the bottom of the shaft, which is about 25 ft deep, the vein shows 2 ft.

PAUL'S AMERICANIZED ARASTRA.—One of these machines is now being put up at the Pool mine, near Hornitos, and it is expected that it will be running the first of the ensuing week. Mr. A. B. Paul, the inventor of it, we understand, will be on hand at the starting. It is well known that the ores of Mariposa county contain more or less silver, which is lost by our battery working. Mr. Paul claims that with this arastra a large per cent. of this silver can be saved, as well as an increased per cent. of gold, and that any rebellious metal which may not amalgamate is also saved by concentration.

HAMBLETON S. M. CO.—This company is unincorporated, and is composed of Mr. John Hambleton, Mr. James Hambleton (his son), and Capt. E. T. Cady. They each have a claim of 1,500 ft, which are consolidated into ons company. One of these claims is the original discovery, located some 12 or 15 years ago, on which a shaft was sunk to a depth of 125 ft by J. H Neale, A. W. Jee and others, and ever since known as the Rockwell shaft. The reasons assigned for the abandonment of the works at that time are inexperience in silver mining and not sufficient in sight to meet the expectations of fortune-hunters, when other mines were producing great quantities of gold that could be heard from every day at that early period of mining activity.

NEVADA.

GOOD CLEAN-UP.—Grass Valley *Union*, April 24: A clean-up of 52 loads of Centeonial ore has been made at the Orleans mill, which gave a yield of $4,500, or $86.50 per load. This does not include the sulphurets, which were also rich. There were a number of loads more of the same quality of rock on the dump at the mine, but the bad weather prevented it being hauled to the mill. The lot of rock yielded a higher figure than it was estimated at.

THE NORTH END DISTRICT.—Novada *Transcript*, April 21: Work in the recently-discovered quartz field of the North End district near this city has been pushed ahead as rapidly as the weather would admit of. Messrs. Campbell, Chadwick & Co., who made two locations of 1,500 ft each on cross-ledges at a point about a mile northeast of Kirkham & Hitchcock's mine, have prospected sufficiently to ascertain that they have two good bodies of ore, both of which possess first-class indications of permanency and richness. As soon as the present storm ceases they propose to continue the work of development. The various other parties who have locations in the same section, although prevented by the elements from continuing their prospecting as vigorously as could be wished, feel so well satisfied with what they have already opened up that they are exceeding anxious for the time to come when they can recommence work on the tunnels and shafts.

SHASTA.

SILVER DISCOVERIES.—Reading *Independent*, April 22: Visiting the county seat last Saturday we found things rather quiet, but still some excitement over the discovery of an extensive silver ledge on McGee and Camden's iron mountain; this discovery is reported to be very rich. The good old town of Shasta, as well as the county in general, will be much benefited by this "find," if it proves as rich as reported.

SIERRA.

ENCOURAGING.—*Mountain Messenger*, April 17: After one day's run at the North Fork drift gravel claim, Forest City, recently, a clean-up of 78 ounces of gold was made. The owners who have had many difficulties to contend with in the past, are highly elated over their present good prospects.

SOFT ROCK.—We understand that the Savage company have struck much softer rock in their tunnel. This being the case the work will go ahead rapidly.

WORK.—Mining has been commenced at Eureka, Beard having water enough to begin piping.

THE company which bought the Irelan ground are about to commence a tunnel in Little Rock creek, to prospect the lead. H. Wallis has been appointented Superintendent.

TRINITY.

SPLENDID STORM.—Trinity *Journal*, April 24: While other sections of this State may think they have too much storm of late, it is not so here. Mining cannot be successfully carried on without water, and water is only furnished by good storms, just such as we have been favored with of late. Since our last issue 3.40 inches of rain and 19 inches of snow have fallen, making 35.31 rain and 135½ snow for the season—an aggregate waterfall to date of 47.65 inches. This insures a splendid spring and summer run of water, say until about August. The gold yield of Trinity will doubtless be far above the average this year.

DOING GOOD WORK.—Mr. John Yule, Superintendent of the McGillivray property, tells us that he is now working 14 men in the mine and making a good showing. Although no clean-ups have been made of late, indications are most favorable for a profitable season. Mr. Yule is energetic and a thoroughly practical miner, one who is bound to succeed.

TUOLUMNE.

STARR KING.—Cor. Tuolumne *Independent*, April 24: The Starr King mine is turning out some very rich ore at present; richer than ever before. With the present prospect, and under the charge of our worthy Superintendent, Mr. Alexander, this mine will be one of profit instead of expense, which it has been heretofore.

W. H. HOWLANN'S new mill, which he is trying to make answer in place of stamps, which crushes the ore by means of rollers, has been tried at the Spring Gulch mine, and would have been a success only for the lack of sufficient screens. He has gone below to remedy this deficiency. They run it at Spring Gulch with a small donkey engine. It only required 3 days to put it up in running order, which you can see at once is a profit.

ORE.—Last week while crosscutting in the Spring Gulch, the miners struck a new chute of ore. Our informant saw a piece, weighing about 20 pounds, literally filled with long streaks of gold. If there is any company in Tuolumne that deserves good fortune, it is the Spring Gulch. They have expended a great deal of money in fine mills, hoisting works and general improvements.

COLUMBIA, and the country around its immediate vicinity, has been greatly benefited by the bountiful rains of the past 2 weeks. Mining interests in and around Columbia are looming up in every direction. Never during the history of old Tuolumne county has there been so many capitalists with capital, examining, purchasing, bonding and preparing to extensively work the quartz and gravel mines in every district in the county. What is still better and giving great encouragement to our people, are the new comers among us, who are, as a general thing, men of experience, enterprise and ample means at their command. The work and prospecting so far done establishes the fact, beyond peradventure, that we have in Tuolumne county very many valuable mines.

A NEW and prospectively valuable mine has recently been discovered but a short distance from the town limits of Columbia. Mr. Frank Vassallo and Mr. Alfred Evans are the discoverers and locators of the mine, which they have christened with the name of the Columbia gold and sulphuret mine.

MR. DAVE LEVY has started up work again upon his mine in Wet gulch, situated about 2½ miles northeasterly from Columbia, and near the famous Pine Log precinct. He has come upon some very rich rock in the 100-ft incline. As the developments progress, the ledge is widening out.

THE Vineyard Hill mine, on the easterly side of the county road, near Springfield, owned and worked by Messrs. L. A. Crandall and Andrew Greenman, is now down 45 ft, showing a 2½-ft ledge, which prospects well. In the gulch near where the mine is situated, Capt. Whiteside in early days took out in a short time $10,000, and near by a Mr. Marston something over $5,000.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—Gold Hill *News*, April 28: From the north drift on the 2300 level, after drilling ahead to guard against water, a drift has been started west on the line of the proposed raise to connect with the main shaft of the mine. This work was commenced but yesterday.

COX. VIRGINIA.—The C. & C. shaft is being continued on down; total depth, 2,330 ft. The joint California crosscut east on the 2300 level continues in a heavy vein material carrying clay and quartz; total length, 85 ft. The similar crosscut on the 2200 level is in vein matter; total length, 315 ft. The bottom of the north lateral branch of the Sutro tunnel is but 9 ft above the top of the drift on the 1750 level.

OPHIR.—To-day a crosscut was started east on the 2500 level joint with Mexican, the object being to reach a point where a raise can be made to connect with the joint winze coming down from the 2300 level.

CALIFORNIA.—Explorations for ore on the 1500 level east of the old stopes goes on. A winze has been started from the 2000 level to meet the raise being made from the 2100 level in the ore vein north. On the 2300 level a drift has been started north to connect with that which was pushed 191 ft south from the Ophir line. When this connection is made the thoroughfare will be opened from the C. & C. to the Union shaft.

UNION SHAFT.—The shaft has been drained of the recent accumulation of water. Should a large increase be encountered in sinking, a sinking pump will be put in position and the influx thus readily handled. The flow of water into the shaft is draining the Sierra Nevada incline. The pumps in the shaft handled all the water encountered and that coming from the Mexican and Sierra Nevada, and are required to make only four strokes per minute.

UNION CON.—The drift, 2500 level, to connect the bottom of No. 1 winze from the 2400 level with the Sierra Nevada incline station on the 2500 level, has been commenced.

CHOLLAR.—Raising water at the rate of 7,000 tons of 2,000 pounds each per day. Of this amount, 5,200 tons are raised by the pumps to the Sutro tunnel level, and the balance is raised by bailing tanks to the surface. The water is controlled, but all other work must be stopped till the flow decreases.

CROWN POINT.—The incline winze is averaging 6 ft per day, on the slope, in additional depth, and is now 420 ft on the incline below the 2700 level. It will reach the 3000 level about the 1st of the coming month.

SAVAGE.—The flow of water encountered in the drift from the C. N. S. shaft, 2400 level, and which was struck Sunday, and filled the bottom of the drift to the hight of 5 or 6 inches, is now conducted to the sumps in a sub-drain.

BELCHER.—The Belcher has a big job of pumping on hand which is liable to last 2 or 3 days yet. Until the flood is reduced from the 3000 level no air can be spared to ventilate and resume work on the 2700 level.

YELLOW JACKET.—The shaft has attained a perpendicular depth of 2,905 ft, the bottom in harder rock; no increase of water.

BRISTOL DISTRICT.

STARTING UP.—Ploche *Record*, April 17: The finishing touches were put on the Hillside water jacket last Wednesday and connections made preparatory to starting up on Monday. The furnace is a model of beauty and pronounced by John Reynolds, the foreman of the Richmond, as being the most perfect and finest of its kind in the State.

AT the mill site of the Bristol mill and mining company work in setting the boiler and engine in connection with the boring apparatus was completed yesterday, and operations will soon commence sinking for flowing water.

EUREKA DISTRICT.

NOTES.—Eureka *Sentinel*, April 24: A company of miners are negotiating with the owners of the Metamoras mine for a lease of that property, and if satisfactory arrangements are made work on an extensive scale will be commenced about the 1st of May. An important series of mines on Adams hill have been bonded to an English company, and everything indicates that a sale will be made at an early day. W. H. Taylor & Co. have been extracting about two tons of ore daily from the San Jose, on Prospect mountain, since the last important strike was made, the ore averaging from $120 to $165 per ton. Mr. D. K. Ralston, who is largely interested in the Bayard Taylor Con. and Maryland tunnel, intends returning to Eureka about May 1st, and will commence work on both properties soon. Mr. Jerry McMahoo was in town last evening making arrangements for the shipment of ore from the Grant mine to the Richmond furnaces, and reports the mine improving.

STRIKE IN THE EL DORADO.—What promises to be a development of great importance, has been made in the El Dorado mine, Prospect mountain. The ore was struck in a drift between 150 and 100 ft from the surface. The extent of the body is not yet known. It was cut on one side of the drift, and it has maintained this position for about 10 ft. Good judges say the samples brought down will assay from $400 to $500 per ton, going very high in gold. Mr. Reilley thinks he has, at last, got a bonanza, and feels much encouraged. He has industriously pursued a fruitless search for ore for the past year, never having struck as much as a trace until now. The El Dorado has, in the past, been one of the best paying mines on Prospect mountain. Several parties have made handsome piles out of it. The mine, in all, has probably yielded in the neighborhood of a quarter of a million. It is the property of the Ruby-Dunderberg company. Mr. Reilley has a two-years lease of it.

Two prominent mines were bonded yesterday for the Eastern market. We are requested to withhold names and particulars for the present.

MOUNT ROSE DISTRICT.

WORK TO BE RESUMED.—Paradise *Reporter*, April 17: Operations will shortly be resumed on the Big Prize and Mount Rose mines, in Mount Rose district. A complaint has been heard on all sides about the management of these claims, but doubtless the speedy resumption of work will silence the murmurings of the dissatisfied stockholders.

PARADISE DISTRICT.

STRIKE.—Paradise *Reporter*, April 17: The Paradise claim is reported to have encountered a rich and extensive ore body in No. 4. The Paradise company employ a force of 40 men, ships nearly $20,000 monthly, have extracted over $250,000 since the incorporation, less than 2 years ago, and claim to have sufficient ore in sight to run a 20-stamp mill for 2 years; still the stock operates like a wet blanket on the prospects of the camp, and drags heavily along at 50 cents per share in the San Francisco market.

THE negotiations for the transfer of the "Bullion of Paradise" stock have fallen through, the timid New Yorkers having forfeited the bond by failing to comply with the cash stipulations of the agreement.

SOME very rich ore is being uncovered in the Bullion winze, and the mill is crushing, on an average, 18 tons daily.

THERE is every indication that the mining industry of this vicinity will be prosecuted vigorously during the ensuing season.

PIOCHE DISTRICT.

CONCENTRATING WORKS.—Piochc *Record*, April 17: The concentrating works of W. J. Montgomery at Bullionville, concentrating the Raymond & Ely tailings, are now an assured success. He has now put up four tables and run railway tracks down to the pit and is concentrating 100 tons of tailings per day. These are being shipped as rapidly as teams can be procured to the furnaces in Utah for reduction. Mr. Montgomery, if he makes the necessary arrangements with the American Flag M. & M. Co., will erect a furnace and smelt his concentrations at Bullionville instead of shipping them. There is in the tailing pit over 250,000 tons of tailings, which the Raymond & Ely company can sell at any time at $1 per ton.

RAYMOND & ELY.—The Raymond & Ely mine and mill have been mortgaged to Messrs. Sazard Freres & Cahn, of San Francisco, for $105,675. Captain Garber arrived one day last week and took possession of the property. The people of Pioche were thrown into excitement over the occurrence. Some of the miners, after working a day or two under the new order of things, threw up their jobs. They were told to go to the office and get their money, but when they presented themselves they were offered 30-day drafts on San Francisco, which they declined, a few of them filing labor liens on the property. Captain Garber informed the *Record* that the mine would be worked the same as usual under the new management, and that the transfer would redound to the best interests of Pioche.

SILVER KING DISTICT.

LOOKING WELL.—Pioche *Record*, April 17: The mines at Silver King district are looking well. Developments are being rapidly pushed ahead and sinking has already begun upon the Cæsar and Highbridge mines.

SILVER PARK DISTRICT.

RESUMING ACTIVITY.—Pioche *Record*, April 17: This

CONTINUED ON PAGE 284.

The Microscope in Geology.

Abstract of a short lecture delivered before the S. F. Academy of Sciences in November, 1878.]

I have thought that a short account of the important results that have been brought about by the introduction of the microscope as an instrument of geological research, might prove not uninteresting to the members of the Academy.

Geology, although the youngest of the sisterhood of natural sciences, has nevertheless made most rapid progress toward the condition of a true inductive science. But its progress has been unequal in different directions.

Since Lyell first gave us the key to dynamical geology in his doctrine of the interpretation of past geological phenomena as the effects of existing forces acting upon and within the earth, and since Buffon first made clear to us the true significance of the organic remains of the sedimentary rocks, progress in the direction of *dynamical* geology and in the direction of *historical* geology has been rapid and satisfactory. The same cannot be said, however, of the branch of geology known as *petrography* or *lithology* which has for its object the study of the mineral constituents, structure, and relative position of rocks in order to arrive at a true conception of rock-genesis or rock-formation.

A portion of this subject is well understood. The formation of sedimentary or stratified rocks, such as sandstones, marls, shales, clays, etc., goes on under our very eyes, so that we have but to observe carefully and the whole process becomes clear. The formation of sedimentary rocks, then, is well understood. Not so, however, that of the rocks known as crystalline schists, and the massive, igneous, or eruptive rocks.

I may be pardoned if I devote a few moments to a brief exposition of the nature of these different rocks. A clear conception of their general character, at least, is essential to a just appreciation of my subsequent remarks.

First, as to the difference between a *mineral* and a *rock*. I will give you the strictly scientific definition which I give to my students in mineralogy: "Any homogeneous solid or fluid body, which is a direct production of nature without the agency of organic processes," we call a mineral. A rock, on the other hand, consists of two or more minerals intimately mixed. The essential idea of a mineral is *homogeneity*, both of molecular structure and chemical composition; of a rock, *heterogeneity*, of either or both. The definition of a rock, however, is still farther extended to include minerals occurring in very extensive deposits.

There are many different kinds of rocks, differing in structure, mineral composition and genesis. We distinguish:

I. Clastic or fragmental.
II. Crystalline.
III. Amorphous.

A careful examination of a large number of rocks shows that they are composed entirely of the fragments of pre-existing rocks which have been bound together by a cement or by great pressure, or both, to a more or less compact mass. To this class of rocks we give the name *clastic* or *fragmental*. It comprises the sedimentary rocks, sandstones, shales, clays and the like. Another large class of rocks are composed either of crystalline mineral grannles in immediate juxtaposition, *i. e.*, without any cementing material between them, such as granite, or cemented by a glass like many lavas.

These rocks are distinguished, according to the size of their granules, into *macro-crystalline* (distinctly crystalline) and *crypto-crystalline* (concealed crystalline), and, according to the mutual position of their grannles, into *shistoid* and *massive*. The third class, comprising the amorphous rocks, is of much less extent than the other two, although it is of great genetic value as throwing light upon the true nature of many of the crystalline rocks. It includes the natural glasses, obsidian, pumice-stone, pitch-stone and the like.

Now, as I observed before, the composition and genesis of the clastic or fragmental rocks is well understood. It is in these macro, and crypto-crystalline, shistoid and massive rocks that the great interest in petrography centers itself at the present time. It is in these that the great work is being carried on.

We have seen that rocks are often developed crypto-crystalline—*i. e.*, apparently homogeneous—and up to comparatively recent times such rocks passed for *really* homogeneous mineral substances, whereas in fact most of them are just as heterogeneous in composition as granite, consisting of three, four, five or more minerals, these minerals being quite different for different crypto-crystalline rocks. Sometimes their composite character was recognized, the exact mineral composition, however, being entirely a matter of conjecture. Is it to be wondered that such great confusion should characterize this branch of geology as does actually exist? Rocks of widely different nature are classed together under one name, because they are crypto-crystalline and of the same color, and on the other hand similarly constituted rocks are as widely separated from ignorance of their true character.

What would the modern zoologist say of one who classed the porpoise, the whale and the shark together and denied the value of specific designations because all lived in the water and were of nearly the same color? And yet this is exactly what most of our American geologists do when they speak of the rock *trapp* for instance, a term under which is included a great variety of rocks of different mineralogical composition, structure and geological position, but all possessing in common the characteristic crypto-crystalline structure and black color.

In consequence of this condition of things, it is simply impossible for two geologists to talk with each other about igneous rocks without continually defining the meaning they attach to the names they use.

In view then of the misapprehension and ignorance of the true nature of this most important class of rocks, is it strange that in the course of the development of the sciences of geology many wild theories of rock-genesis should have been suggested and defended even by eminent geologists, theories for which there existed not a particle of foundation in fact? It is in this, as in all of the natural sciences, all speculation, all theory, all hypothesis must be based upon accurately observed facts. Every separate mineral, every peculiarity of structure, every crystal-form even, is the expression of some condition (we know not how important) that existed at the time of the formation of the rock in which they are observed. And it is only when we know the minerals accurately, when we are familiar with every peculiarity of structure and crystal-form, that we can reason backward to the conditions of which they are the expression.

It is right here that the microscope has, comparatively, recently come to our aid. Not only are we now able to study the intimate structure of the coarse granular (macro-crystalline) rocks, but, in extremely thin sections, by means of its aid, the indefinitely small crystallins granules which make up the crypto-crystallins rocks can be accurately investigated. Their mineralogical nature and the detailed structure of the rock can be definitely determined, and we are thus enabled to throw some light upon its genesis.

Not of *all* rocks, however, some few are still involved in absolute darkness. Nothing can be determined about them—composition, age, genesis are all a mystery. Many geologists do not recognize this fact. Present to them such a rock and they will easily and quickly give you a name for it. It will probably be "trapp." But such man have so long deceived themselves with regard to this entire class of crypto-crystallins rocks, that they have come to think the whole matter very simple. It is a great mistake however. In no department of natural science are we treading upon such uncertain ground as in petrography; unsolved and apparently unsolvable problems meet us at every turn, and until within a very few years geologists have been compelled to acknowledge that they knew scarcely more of the true nature and origin of the crystallins rocks than they did nearly a century ago. No method of investigation applied to the rocks, however, has been attended with such peculiarly gratifying success as the microscopic study of thin sections. It has thrown a flood of light upon a class of rocks hitherto the most obscure, and with its aid the whole subject has for the first time been reduced to some kind of system. It may be premature to speak of "system" yet. Rather let me say, that in the last ten years an enormous amount of material has been collected, and is still being collected, out of which future systems will be formed.

Perhaps no better instance than this can be adduced of the reanimating effect upon any department of science of the introduction into it of a new method of investigation. Further progress in the direction of petrography seemed to be at an end. Chemistry had grappled with the problems presented, had worked long and faithfully, but had finally been compelled to acknowledge herself unable to solve them. Then, after a space, came the microscope. Just as the telescope, in the hands of Galileo, first gave us a true conception of the creations and processes of *infinite space*, and infused new life and spirit into astronomical research, so the microscope, in the hands of Henry Clifton Sorby, first gave us a true conception of the creations and processes of *infinite time*, and reanimated to a wonderful degree geological research in this direction.

On the present occasion I desired simply to call your attention to the nature and extent of the vast field of activity that has been within a comparatively short time opened up to the geologist in the direction of microscopic petrography. The strife which has so long been waged between the Plutonists and the Neptunists has been transferred to this new field of observation, and no geologist, who would contribute his share to the solution of the many intricate questions involved, can afford to be ignorant of the results nor altogether unfamiliar with the methods employed.

At another time I will give you some more detailed accounts of these methods and results, and indicate their bearing upon the important questions of rock-genesis.

A. W. Jackson, Univ. of Cal., Berkeley.

Mining Experts in Colorado.—The Ouray (Col.) *Solid Muldoon* says that under the local mining laws of Ouray county, mining expert scalps will be taken at $4 each in payment of taxes. When a New York mining expert arrives in Ouray with letters of recommendation from "prominent Eastern capitalists," he is given just four hours to skip, and he generally skips.

The Concentration of Ores.

There are undoubtedly now lying in the Comstock mineral belt, in the ground that has been passed by in the downward race after the sugar plums in the shape of bonanzas, many more millions than have ever been extracted. The great lode has thus far been gouged; everybody has been going for the cream of it. When ore would not pay in bulk, just as dug down from the vein, it has as a rule been passed by. Some little assorting, so called, has always been done in the mine and at the time of digging down the ore. It could hardly be called assorting even, as it consists merely in digging out the richest ore and rejecting the poorest. Sometimes men merely looked over the entire mass as dug down and threw out such of the larger blocks of porphyry as they happened to see. Very little pains has ever been taken in this business, as Superintendents and owners of mines have always been in haste to get on down in the expectation of finding something richer—bonanzas, where solid masses of black sulphurets and chloride ores could be blasted down, shoveled into cars and shot up to the surface and away to the mills.

Where a block of ground would not pay as it stood, or with slight and hasty assorting on the spot, it was left behind and it is there yet. No one has ever tried the experiment of making one ton, or half a ton of two tons, of rock that would not pay for reduction as it stood in bulk. Even in ore of low grade that will pay a small profit for working it would seem that there would still be economy in concentration if it could be cheaply done, as there would then be a much smaller bulk to be treated in the amalgamating pans, smaller quantities of chemicals would be required and the material could be more carefully worked.

In the Leadvills country they are working mines where they are obliged to concentrate from the start—to concentrate all the ore taken out—and these mines are considered great properties. Our people should begin to look after the machines and apparatus by means of which these results are achieved. We have millions of tons of low grade ores in the croppings of the Comstock, and at slight depths below these croppings, which will pay by making one ton or half a ton of what is now two tons of material. This is quite certain, as even now persons are gouging into these croppings in several places, and by men hand assorting are getting out ore of which a ton must be worked through pans and all else as a ton, and must therefore pay as much as any other ton extracted on the Comstock.

It would seem that with some cheap and rapid method of concentrating—either dry or by means of water—that employment should be found at fair wages for the hundreds of men now idle on the Comstock, and the thousands who would flock hither, could they be sure of work at which they could lay up some money.

The experiment of concentrating base metal ores will soon be tried here. Although this is a thing somewhat different from what we have been talking about above, yet it is a beginning and a move in the right direction. The experiment of which we speak is that of concentrating the base metal ores of the North Bonanza and Flowery mines. Mr. Jackson, Superintendent of said mines, has left for San Francisco to examine some of the machines used for the concentration of ores, and for the purpose of making other arrangements with a view to setting up concentrating machinery on Six mile canyon, near his mines.

In this business of the concentration of ores is a splendid field for inventors, for there are millions in it. We think it will yet be seen that in the final cleaning up of the Comstock more money will be taken out than in the first dash at the cream. It will be as in California in the early days, where, in many instances, those who worked mines the second time took out more gold than did those who first worked them.—*Virginia Enterprise.*

To Reduce Miners Wages.—It is being hinted in some of the papers in the western part of the State that an effort is shortly to be made to reduce miners wages. If the effort is made the *Sentinel* hopes it will prove unsuccessful. Miners get little enough, with the present cost of living in this State considered. If it is desired to reduce the expenses of mining the rates of transportation should first be assailed. The labor account is a small item in comparison with the cost of mining supplies in general. No miner can live and support a family on less than $4 a day. At best they do not get steady employment, and their earnings are not one farthing more than they should be. The *Sentinel* will always oppose any reduction in wages until miners can support themselves and families for one-half what it now costs them.—*Eureka Sentinel.*

Air Motors in the Sutro Tunnel.—The Gold Hill *News* says: Four compressed air motors, manufactured by the Grange Iron Company, Durham, England, will be used in transporting material, rock, etc., through the tunnel. Each of these motors or engines has an extra air receiver, all of which will be supplied with air from a stationary receiver at the station at shaft No. 2 as they pass in and out. The motors are each five feet high, and are built on the same plan as those in use on Second avenue, New York city, where they serve as power for street cars. Each motor, with its extra receiver, has a capacity for hauling 40 carloads (two tons each) of rock from the header.

Recent Decisions Relating to Patents, etc.

We give below brief abstracts of decisions* rendered upon patent cases in litigation, for the benefit of our readers:

Imhaeuser vs. Buerk.

Supreme Court of the United States—Decided October term, 1879. Mr. Justice Clifford delivered the opinion of the court.

1. Equivalents may be claimed by a patentee of an invention consisting of combination of old elements or ingredients as well as of any other valid patented improvement, provided the arrangement of the parts composing the invention is new and will produce a new and useful result.

2. The term "equivalent," as applied to a combination of old elements, is special in its significence and somewhat different from what is meant when the term is applied to an invention consisting of a new device or an entirely new machine.

3. In the former case it means that the patent in respect to each of the respective ingredients comprising the invention covers every other ingredient which in the same arrangement of the parts will perform the same function, providing it was well known as a proper substitute for the one described in the specification at the date of the patent.

4. When the thing patented is an entirety, consisting of a single device or combination of old elements incapable of division or of separate use, the respondent cannot escape the charge of infringement by alleging or proving that a part of the entire invention is found in one prior patent, printed publication, or machine, and another part in another prior exhibit, and a third part in another, and from the three or more draw the conclusions that the patentee is not the original and first inventor of the patented improvement.

5. The burden of proving infringement is upon plaintiff or complainant, and never shifts if the charge is denied in the plea or answer.

6. Sufficient proof of infringement may be derived from the comparison of that which is used by the defendant with the description of the invention given in the specification of the patent which constitutes the foundation of the suit.

Appeal from the Circuit Court of the United States from the southern district of New York.

Exceptions were taken to the Master's Report, but the rulings of the court in respect to the amount adjudged to the complainant for the infringement, not having been assigned for error, are not the proper subject of re-examination.

Decree affirmed.

Liggett & Myers' Tobacco Co. vs. Miller et al.

United States Circuit Court, Eastern District of Missouri—Decided March term, 1880; McCrary, Justice.

1. The proceedings contemplated by section 4,918 of the Revised Statutes contemplate an ordinary proceeding in chancery. It is an adversary proceeding, in which the party must file the usual bill in chancery and issue the subpœna required by the chancery practice.

2. No law in the United States makes provision for the service of any process outside of the district, and section 4,918 does not permit the Circuit courts, by the issuing of a notice of the filing of a bill to declare an interfering patent invalid, or by any other process to bring before it citizens from any and every part of the United States to have their rights adjudicated there.

3. Such section clearly contemplates that the ordinary course of equity proceedings shall be pursued, and that the judgment shall operate only so far as the jurisdiction of the court shall extend.

Motion to quash notice is sustained.

Howes et al. vs. McNeal.

United States Circuit Court, Northern District of New York—Decided Jan. 15, 1880; Blatchford, Justice.

1. The file-wrapper contents and drawings of a patent set up in defense in an action for infringement are not competent to show that the invention described in such patent was made at the date of the oath; nor is it the proper way to show reduction to practice and use of the invention, so as to invalidate the patent issued upon.

2. When patents are cited as anticipating the plaintiff's patent they speak only as public grants, and nothing from the Patent Office can be admitted in evidence of earlier dates than the patents themselves.

3. The preliminary papers filed in the Patent Office are merely the declaration of third persons not parties to the suit or connected with them in interest or title, and are incompetent as hearsay and secondary.

In this case a motion is made by the defendant that copies of three file-wrappers, contents and drawings in the matter of three several letters patents may be made a part of the defendant's exhibits and proofs with the same effect as if they had been put in evidence when said three letters patent were put in evidence, or that the suit be referred back to the examiner with leave to the defendant to introduce such evidence, or that it be referred back for both parties to introduce further proofs, and that the interlocutory decree made herein be so far opened as that the defendant have leave to reargue the case after such new evidence shall have been received, with the same effect as though the same had never been argued.

The motion is denied in all its branches.

ACTING COMMISSIONER'S DECISIONS.

Rice ve. Burt et al.

Motion to Dissolve Interference—Decided Mar. 6, 1880; Doolittle, Act. Com.

1. A mere aggregation of processes, each accomplishing independently of the other its well-known result, not patentable any more than a mere aggregation of mechanical device.

2. Hence a claim for the "process of purifying common salt, consisting in washing the salt, after being taken from the graniers, with brine and decomposing any remaining earthy chlorides with carbonate of soda by mixing the salt and carbonate of soda together," rejected in view of separate references describing, first, washing the salt, after being taken from the graniers, with brine; and, second, decomposing the earthy chlorides by mixing the salt and carbonate of soda together.

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* More complete reports of the proceedings may be found on file in the office of the Mining and Scientific Press Patent Agency, 202 Sansome street.

Cement for General Use.—For joining paper, card-board, or model work, or similar articles a good glue can be made of glue, vinegar, and alcohol. Dissolve 2 ounces of the best transparent glue in a quarter of a pint of strong cider vinegar. Let it simmer slowly by placing the dish containing it in a dish of boiling water. When it has become liquid, add one ounce of highest-proof alcohol, and keep it tightly corked. If solidified by cold, heat in hot water when needed for use. Dilute acetic acid may be substituted for the cider vinegar.—*Chemist & Drug.*

A Queer Bone-Anza.—The shaft of the Rosebud mine is down about 110 feet, and presents some queer phenomena. On one side of it for many feet the porphyry has been thickly interspersed with promising ore, and on the other it is a solid mass of old jawbones, skeletons of men and animals of races long extinct. A bonanza of mingled gold and fossils is something new even in this wonderland.—*Black Hills Pioneer.*

On the Gum-lac from Arizona.

[Read before California Academy of Sciences, Mar. 1, 1880.]

In a previous communicatiou I gavo a description of the properties of a resinous incrustation on the twigs of the *Larrea Mexicana*, which seems to be identical or nearly ideatical with the gum-lac of Iodia. I mentioned, if I remember correctly, in that communication, that the same or a similar gnm was said to appear on the so-called "cat-claw" of Arizona. Since writing that communication I have come into possession of a small bundlo of twigs of that plant, which has bceo identified for me by Prof. Hilgard, of this University, as the *Acacia Greggii*, a deciduous shrub or tree common in Arizoaa and Mexico. The twigs were coated with a scantier deposit of the gum than tho twige of the larrea possessed, and the irregnlarity of tho surface of the resin also appears to indicate that the acacia does not presont ao favorable conditions for the production of the resiu as tho larrea.

In its general properties and chemical reactions, the lac from the acacia agrees with that from the larrea. It softens at low temperatures, possesses the samo peculiar aromatic odor, dissolves partly in alcohol, almost entirely in caustic potash, dissolvcs in borax solutions on boiling, and is again reprecipitated hy acidulation. Its solutions in canstic potash and borax possessed a red color, but not the deep purple-red of the lac of the larrea. The amonat of coloring matter is decidodly less. On boiling with water, no red coloration was produced in the extract. On addiag an alkali to this water, however, the color is immediately turned red. I noticed, however, that quite an appreciable quantity of alkali had to be added before this was effected, ehowiag that eome acid was present in the extract which had first to be neutralized before the coloring matter hecame visible. The question suggests itself whether this may not bo the laccic acid of Dr. John—(Muspratt.)

The specimens of acacia-lac were collected dnriag the season when the twigs were dry and the leaves dead, and none of the specimens examined contaiaed the massee of egge with red juice in the ccile. The cells were dry and contained only the dried or nearly dry sacs. It is therefore not improbable that if collected at other seasons the dye would he present in greater quantity.

From observatione hy a number of gontlemen acquainted in that region of the country it appears that the larrea-lac is very widely distributed through Arizonia and the southern part of California (notably the Mohave and Colorado deserts), and the resinous gnm is used in the place of eolder for mending kettles, etc., by the inhabitants. This nse is suggestive of the use of the India-lac for the manufacture of sealing-wax. Whether the lac from either or both of these sourcee will prove of important commercial value, will depend on the quality and cost of prodnction of the shellac prepared from it.

J. M. Stillman.

University of Cal., March 1, 1880.

El Dorado County Mines.

In tbis connty there are a great many mines, placer, hydraulic, quartz, porphyry, gravel, and one silver mine. And all kinde are being worked more or less. Some are only slightly prospected, some are partially opened up, but very few have had work enongh done on them to show what there is to be found in them, as to extent, depth, and, therefore, as to their valne. As time rolls along capitalists and experts, reaching for good property to place their money in, come to El Dorado county, see some one of the many that pleaee their fancy, and invest in it. Within the last year a great number of our mines have been purchased by Eastern, European and California capitalists, and ae nearly all of them are going to do more or less work on tbem this summer—many being at work now—we are certain of a good seasoa of mining business.

The mines of this county are yet to be the best in the State, and, as the county contaias eo many different kinds, almost any class of mining capitalists and experts can be suited. Immease deposits of gravel are yet to be washed down, and the amount of ground that will pay largely to hydraulic is yet to be measured, as it extends the entire length of the county, and almost its width.

The pocket leads are legion, and an immense amount of gold has been, and is now being taken ont monthly from these porphyry streaks, often running up to tbousands of dollars from one in a week.

Bnt in our quartz mines our permanency as a mining community exists. There has never been one mine snnk deep enough, nor had work enough done on it to find where the pay rock ceases. The only one that has come anywhere near being developed is the Placerville gold quartz company's mine, and they have just put up and are working a new 20-stamp mill, with new hoisting works, and everything complete, and they do this hecause they have sunk deep enough and know perfectly well what is above them, and know that what is in eight is a good investment for their expenditure, and, as to what is under them, whether good or bad, their investment ie good. No one hae snnk down any deeper than they have on thie divide, and there is no reason to helieve that the mines are not better the deeper they go down, even helow the lowest depthe of the "old Pacific."—*Mountain Democrat.*

Useful Information.

Dyes from Camphor.—Dr. W. H. Gregg, of Elmira, N. Y., is reported to have succeeded in obtaining a new coloring principle from camphor, to which he gives the name of "Lanrelioe." Thus far he has only succeeded in producing various shades of yellow from it; but he is reported to be engaged in certain experiments which he hopes will result in the production of carmine and scarlet. The chief feature of the cew dyestuff which recommeads it to the attention of textilo manufacturers, is in the brilliancy and fastness of the colors. It can be used upon linen, cottoa and silk with no apparent differonce in dcusity and hrilliancy, and goods thus dyed are eaid to be entirely unaffected hy the ordinary tests to which they will be subjected in use. Boiling for hours in a strong eoap solution barely turaed the shade of a cotton samplo. With indigo, a handsome green is produced. The inventor is not yet prepared to givo special details respecting the cost of produciag the new dye, or of tho precise methods of nsing it; but as regards tho first item, he intimates that it will be one of tho cheapest, and as to the sscond, ono of the eimplest coloring mattere to make and apply. The textile journale speak in terme of great interest of the new discovery.

Gold Wire.—An interesting mechanical operation is the maaafacture of gold wire for what is known as gold lace. The refiner firet preparee a solid rod of silver about an inch in thickness; be beats this rod, appliee npon the surface a ehcet of gold leaf, burnishes this down—and so on, until the gold is about one-hundredth part the thickness of the silver. The rod is then subjected to a train of processes which brings it down to the stato of fine wire, when it is passed through holes in a steel plate lessening step by etep in diameter. The gold never deeerts the silver, bnt adheres closely to it, and ehares all its mutations; it is one-hundredth part the thickness of the eilver at the beginniug, and it maintains the same ratio to the end. As to the thinness to whicb the gold-coated rod of silver can he brought, the limit depends upon the delicacy of human skill. It has been calculated, however, that the gold actually placed on the very finest silver wire for gold lace is not more than one-third of one-milliontb of an inch in thickness, or about one-tenth the thickness of ordinary gold leaf.

Manufacture of Lager Beer in Small Quantities.—The following recipc ie said to make an excellent beer for home use: To make 5 gallone of beer, take somewhat more than that quantity of soft water, euspend in the vessel containing it a bag with about two ounces of hops, and boil for about half an hour; then add abont 3 pounds of gronnd malt, or, if preferred, a quart of thick sugar syrup (or of molasees); allow the whole to boil up several times, then pour the decoction in a tuh or vat. As soon as it has become say luke-warm, add to it about a half pint of good brewer'e yeast, and allow the whole to remain in a cool place to ferment. At the expiration of six to eight days, it will have become quite clear, and may then be bottled. This beverage may be made stronger or weaker, or more or less bitter, by varying the above proportions; and, when prepared according to this recipe, ie said to make a refreshing and pleasant drink, which will keep very well in a good cellar.

A Bed-Bug Trap.—Edison may be a chieftain among inventors, but if he had lived 3,000 yeare before Christmas he never would have dropped on euch a family blessing as our mining friend, Tom Ortou, did when he accidentlly left his cribbage board in the blankets at the foot of his bunk. Tom didn't have bugs, but his bed did, and had 'em bad. After tbe crih-hoard had been in the bed all night hie eagle eye made the discovery that moet of the holes had been located by enterprising bugs, and he instantly "tumbled" to the idea. False head-boards, foot-boards, and side-boards, bored with innumerahle gimlet holes were provided, and every morning the boards were taken out and the locators scalded. The mortality among the bugs has been fearful since the inventiou, and the hoys down that way, as they roll into their blankets, and drop peacefully into pleasant dreams, pray for blessings to fall on the inventor of the "Orton Thousand-Holed Crib-Board Bed-Bug Destroyer," which has brought peace, rest and comfort to the sleepers of the North Fork.—*Plumas National.*

Sponge Cloth.—A Berlin inventor has patented a new kind of cloth, wheh consists principally or entirely of sponge. The eponges are first thoronghly beaten with a heavy hammer in order to crush all the mineral and vegetahle impurities, so that they can be easily washed out. They are then dried and pared, like a potato, with a sharp knife, the parings beiag sewed together. The fabric thus obtained is free from all the danger which sometimes arises from the absorption of poisonons dyes into the system. It absorbs without checking the perspiration, so as to diminish the danger of taking cold. It is a bad couductor, and therefore helps to maintain a uniform surface temperature. It can be more readily cleansed than the ordinary woolen garments. Its flexihility diminishes the liability of chating. The ease with which it can he employed in shoes, stockings, underware, hat linings and other articles of clothing, seems likely to make it especially useful as a protection against rheumatic and pulmonary attacks.

Conversion of Cane Sugar into Grape Sugar in Cooking.—At a sanitary convention in Grand Rapids, Michigan, recently, the President of the State Board of Health called attention to the bad practice among cooks, by which cane sugar is converted iato grape sugar in cooking, thereby loosing more than half of its sweetening power. Some women, he said, will put the sugar in with a mass of acid fruit to be cooked, and keep cooking and keep adding sugar while it keeps on growing sonrer, until at last they will use two and a half times as much sugar as they ought to secure the desired results. The cane sugar has been changed to grape sugar. Now, if tho sugar had been added after the fruit was cooked, much less would have been required, and the result would have been far more satisfactory.

Petroleum in France and Italy.—A Franco-Italian company has besn formed to explore southern Europe for petroleum. Experts, with boriag apparatus, have been brought from the United States, and the local authorities have promised liheral aid to the undertaking. The first wells are to be sunk at Tocco, in the Abruzzes, and at Rivanazzano, in Lombardy.

Considerable has been writtea about toughened glass as a material for railway sleepers, and now Mr. Bucknall, of Eagland, intends to manufacture toughened glaes pipee for water and gas works, for drains aud chemical pnrposes, ae well as transparent bricks, telegraph insulators and numeroue other articles.

In buying rubber goods, as car-springs, buffers, etc., chooso light ones; heavy onee are loaded up with barytes to make the weight. Color is no test. Never buy old india rubber goods, as that material deteriorates with age.

Clearance for narrow eaw blades may be given, without either epring or spread set, by griuding the back to a knife edge. This is especially useful for keyholé, pruning and fret eaws.

To prevent nickel plating from scaling off from iron or steel objects, copper them first by battery or by simple immersion in a strong solution of sulphate of copper (blue vitriol).

Good Health.

Boys and Tobacco.

A very large proportion of the boys of the present day use tobacco in some form. Their favorite method of poisoning themselves is with the paper cigarette. Boys of very tender years may often be seen with lighted cigarettes in their mouths, puffing away with more industry than would in most cases be shown if they earned their living by it. The effects, in the first place, are not usually pleasant, but during the process of tobacco seasoning, the average boy exhibits considerahle fortitude. We presume very few of these lads realize the inevitable consequences of smoking during the growing period, when bones and musclee are developing. All boys want to be strong and vigorous—to have sound bmbs, hard muscles and rich blood. But if medical science can establish any fact, it is that the use of tobacco in youth checks growth, arrests muscular development, and impoverishee the blood. A physician made test cases of 38 boys, from 9 to 16, who had been in the habit of smoking, and in 27 of the 38 he found ohvious injurious effects. In the remaining 11 the consequences were not so pronounced, but it by no means followed that the seeds of premature debility were not eown. The impairment of nervoue force, which inevitahly results from the use of tobacco, involves a long list of disorders, which take one form or another, according to the constitutional tendouciee of the individual. One of the most common and prominent effects is the impairment of growth. Thie is a misfortune from which there is no remedy. The system may be cleansed and purified, after having arrived at maturity, but the human structure cannot be set to growing again if development ie arrested in the latter yoars of the growing period. Many boys do not know the consequences of their habits, and others, with the disregard of future penalties peculiar to the boy period, do not care what the consequnces mey bs so that their present pleasure is enhaneed. There are hut few boys, however, who would remain insensible to appeale to their reason and to their pride in manhood. It is better, as a rule, to convince a boy that the use of tobacco is injurious, than eimply to convince him that physical chastisement will follow his being caught using it.—*Call.*

Local physicians of Los Angeles say the past winter has been the healthiest in their recollectiou. They ascribe this result to the unusually cold weather which prevailed for some weeke. The cold ecotched and killed the seeds of the zymotic and malarial diseases which are sometimes engendered by wet winters.

Danger from Leaks in Pipes.—An examination made by the Boston Board of Health to discover leaks in pipes by the use of strong volatile oils, show that more than one-half of them were defective and leaky. Thie well illustrates the need of official inspection of bonse fixtures.

Pathological Effects of Starvation.—Tbe autopsy of the remains of the woman who starved herself to death in Cincinuati has not revealed any matcrially diseased condition of the stomach. The fact that she lived 30 days without using any nourishmeut whatever, would justify the conclusion that persons possessed of strong will power, and having the hallucination or delusiou that they are suffering with some orgaaic disease or bodily disorder, may live until the body is entirely consumed. This lady was possessed of great power of will, and she had a delusion that she had no stomach, and, therefore, made up her mind that she wonld not take food or drink, and continned in this condition uutil there was a gencral exhaustiou of the nerve centers and mental faculties, when she went quietly into a calm sleep and died without a struggle. The pathological condition of the passagee leadiug to the stomach, all being normal with no obstruction, and all the organe in a healthy state ready to perform their various offices, wonld warrant the conclueion that thie lady would have lived many years if she could have been induced to partake of sufficient nourishment to eustain life.

Bread.—The indigestion and dyspepsia so rife in the United States can be traced almost directly to the use of alum in bread-making. Alum is an astringent, and taken into the stomach daily cannot fail to produce chronic constipation, followed by a train of serious complaints. The high price of cream of tartar tompts dishonest manufacturers to substitute alum for it in the preparation of the innumerable baking or yeast powders in the market. It is said that there are 500 different brands of powders, and 499 of these have been declared adulterations. Thus the people continue to be poisoned by mercenary merchants, while the authorities sit still and ece the work go on. In California we have what is called a State Board of Health, which is kept up at a considerable expense to the State. What good results from the commission, the public have no means of knowing. It would seem that the examination of the yeast powders in the market, and the punishment of the culprits, would properly come under its province. Let them move in the matter.—*Cal. Medico-Literary Journal.*

Effects of Turpentine on the Health.—A Frenob physician, who has studied the effects of turpentine on some 300 painters coming nnder his observation, arrives at the conclusion that the injurious effects produced by turpentine fumes can never be sufficiently severe to cause death, unless they be volatilized in an extremely confined space—that, where there are frec movement of the air and good ventilation, there need be no fear whatever of fatal accidents from this cause. He has noticed that the vapors of the turpentine coming from different sources have not at all the same energy; that of the French product, for inetance, being far less injurious than those of Hungarian or American turpentines. Again such evil effects as are produced, are, he eays, mostly in the cases of workmen unused to the trade; a very short time, however, sufficing to habituate them thoroughly to its effects. The most general form of indisposition met with among them, which may be directly attributed to the turpontine, are headache, watering of the eyes, coryza, cough, granulations on the larynx and disordered digestion.

Onions.—From our own experience, and the observation of othere, we can fully indorse the testimony of the St. Louis *Miller*, on the healthful propertics of the above esculent. Lung aud liver complaints are certainly benefited, often cured, by a free consumption of onions, either cooked or raw. Colde yield to them like magic. Don't be afraid of them. Taken at night all offense will be wanting by morning, and the good effecte will amply compensate for the trifling annoyance. Taken regularly, they greatly promote the health of the lungs and the digestive organs. An extract made by boiling down the juice of onions to a syrup, and taken as a medicine, answers the purpose very well; but fried, roasted, or boiled, onions are better. Onions are a very cheap medicine, within everybody's reach, and they are not by any means ae "bad to take" as the costly nostrums a neglect of their use may necessitate.

Surgery by the Electric Light.—Dr. Berkeley Hill, of London, recently operated for vaginal fistula in University College, while the vagina was lighted up by Coxeter's application of the glowing platinum wire. The apparatus consisted of a fine wire twisted into a knot. Through this knot was sent a continuous galvanic current, strong enough to maintain the wire at a white heat. The wire was eucloeed in a glass chamher, which was itself also enclosed in another glass cover. Through the space between the glasses, a current of water was allowed to flow, in order to preserve a low temperature aronnd the light. A strong light was maintained for over an hour, close to the margins of the fissure, without impeding the operator's manipulations.

Pie is vile, because it is indigestible, inexcusable and mysterious. It is indigestible because of the very nature of its composition; it is inexcusable because of its tampering with the holiest functions of the stomach to offer pie to it in place of food, and it is mysterious, because you don't know what you are eating. Purchased pie is the worst of all.—*W. A Hammond.*

MINING AND SCIENTIFIC PRESS

W. B. EWER.....SENIOR EDITOR.

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The Week.

The past week has been in these latitudes an exceptionally pleasant one as to weather, and the sunshine has seemed doubly welcome after the long-continued storms. All the creeks and gulches are "booming" with water, much to the delight of hydraulic miners. The hydraulic mining season promises to be an exceedingly prosperous one, in view of the large storage of snow in the mountains, ensuring an abundance of water for some time to come.

Since our last issue the principal excitement and topic of conversation in this city has been the killing of Charles De Young, editor of the San Francisco *Chronicle*, by I. M. Kalloch, son of Mayor Kalloch. It was without doubt a premeditated murder, whatever the provocation may have been. The whole affair brings disgrace on San Francisco, in view of the prominent positions of all the parties concerned.

THE State School of Mines, a growing and worthy institution, has inaugurated a series of geological explorations under the direction of Prof. Lakes, a graduate of Oxford and for several years past the successful assistant of Prof. Marsh in Colorado and Wyoming. Upon the theory—and a correct one it is—that every miner is a geologist to the extent of discovering facts that make up the data of that developing science, the popular reports of these explorations, as published in the *Rocky Mountain News* and the Golden papers, will be read with interest and profit.—*Leadville Democrat.*

THE Little Chief M. Co., of Colorado, paid a dividend of 50 cents per share, amounting to $100,000, at New York, lately. This makes $300,000 paid since the company took possession of this property in January, besides defraying all expenses for dead work. The officers say that for every dollar taken out they have increased the reserve to $3.

JOSEPH SELIGMAN, the New York banker, is dead.

Arizona.—No. 1.

This Territory, though one of the most recently-acquired and even now least-known areas within the Union, is rapidly assuming great importance on account of its extraordinary mineral wealth. Early in the present century, Alexander von Humboldt wrote his belief that the district now included in Arizona and northern Sonora would prove the source of the world's future supply of silver, and his opinion is now being rapidly verified.

The vast Cordillera—the back-bone of America—which, under various names, stretches the whole length of the continent, is in Arizona broken up into short, disconnected chains, and the upper strata are eroded or absent, so that the silver-bearing lodes here crop out in full sight.

The Richness of the Mines

Was known long ago. Those Jesuit Fathers, who were the pioneers of civilization in California, established their missions in what is now southern Arizona, in the 17th century, and two of their towns still exist, one of them now the capital and the largest city in the Territory. These padres knew the richness of the country, and opened several mines, but the rude Apache was too much for them and for other Mexican adventurers, and the secrets of the mountains were tolerably well kept until within a few years.

The early American settlers in Arizona (a very few years ago makes a man an early settler there) suffered greatly from these war-like Indians, and many are the lonely graves of the pioneer miners. But little by little the fact of the existence of vast bodies of ore became known, and capital and enterprise flowed into Arizona. Eastern capitalists came, saw, and bought; English companies located there, and Californians began to wake up to the knowledge that the Comstock was not the only silver lode on the Pacific coast. The dreaded Apache was conquered by Gen. Crook and placed upon reservations; and lastly the Southern Pacific railroad made its way into the country by Fort Yuma, and is now completed to Tucson and 25 miles beyond.

Since the completion of the railroad, the growth of population and the development of the mining interests of the country have been immense, so that every month alters greatly the condition of things, towns, roads and mines starting into existence in all directions.

This new El Dorado promises yet to equal the older ones, over most of which it has some advantages. Lying to the south of Nevada, it has a more diversified surface, and in many parts more wood, water and cultivable ground. Lying north of Mexico it is not (at least in its northern portion) subjected to so intense a heat, while its elevation above the sea renders its climate generally salubrious and its atmosphere clear. The greater fertility of the country, and its proximity to the more thickly populated regions included in the Mexican Republic, cause both labor and supplies, now that the facilities for transport have improved, to be much less than in Utah, Colorado or Nevada.

Although gold and silver are at present the minerals principally sought for, copper, iron, lead, nickel, tin, quicksilver, manganese, tellurium and other metals abound here, though they have been left, comparatively, untouched, because of the inaccessibility of the country and the expense of procuring machinery to work them. Immense beds of coal are thought to exist in the plateau region, but they are not at all worked as yet. Col. R. J. Hinton gives the following as the monthly products of a few of the leading mines in 1878:

Stonewall Jackson and other mines owned by the same company	$100,000
Peck	50,000
McCracken	75,000
Signal	80,000
Tiptop	75,000
Silver King	30,000
Warsaw (Oro Blanco District)	37,000
	$447,000

The amount of bullion produced by Arizona in the year 1879 as given by Wells, Fargo & Co., is $1,942,403. While this sum is no doubt a very close approximation to the value of the bullion sent out, it must be remembered that a very large proportion of the product is not in the shape of bullion going through the hands of that company. The fact is that many of the ores of this section as taken from the mines are of so high a grade that it is found advantageous to ship them in a crude state, and that others are only reduced in weight by concentration and shipped in that form. Also much of the product of the mines is in the form of pigs, such for instance as the copper mines of Clifton, and some of the products of the mines find an eastern outlet, so that the actual yield of the Territory is very much greater than the authentic figures at hand would indicate.

Agricultural Possibilities of Arizona.

In relation to agriculture, R. J. Hinton says: "It is estimated that there are about 2,800,000 acres of land in the Territory of the best quality with surface water to sufficiently irrigate the same by reasonable expenditure on ditches; of which not over 30,000 acres are in cultivation. There are at least 10,000,000 acres, perhaps 15,000,000 to 20,000,000 of rich land that can be cultivated by means of artesian wells; such as, when thus made available, is sold in Los Angeles and San Bernardino counties, Cal., for $50 per acre and upwards, but which can at present be had in Arizona for the taking; with the difference that the average depth to water would probably not be half as great as in the counties above named. Most of this is as good fruit and grape land as the best lands in southern California. Even the deserts are not continuously sandy, barren wastes, but through and across them in various directions run extensive valleys.

"Fully half the rain falls in the hot season when it does most good, and in many localities the average annual rainfall is double that of southern California."

Fauna and Flora.

Dr. Loew, of the Wheeler Exploring expedition, thus divides, in a vertical direction, the regions of the southwest.

1. Zone of cactus, yucca and agave; altitude, 3,000 or 3,500 feet; grass, scanty; vegetation luxuriant where there is water.

2. Zone of obione and artemisia (grease wood and sage brush); altitude, 3,500 to 4,900 feet; grass, poor, with few exceptions, on granitic and volcanic soil; cacti less abundant.

3. Zone of *Juniperus occidentalis* (cedar); altitude, 4,900 to 6,800 feet; cacti few.

4. Zone of pine and fir 6,800 to 10,800. These figures give the highest limits, but descend lower on eastern and northern than on southern and western slopes.

The pinon *(Pinus edulis)*, which furnishes food to the Indians, scrub oak and live oak, occur in the juniper zone. The great Colorado forests mainly consists of *Pinus ponderosa* (yellow pine), *Pinus contorta* (tamarack and red pine), *Abies Engelmanni* (called "white pine"), *A. Menziesii* (called balsam), and *A. Douglasii.*

These woods, with those of the juniper belt, are common in the north, center and east of the Territory, and on all the river bottoms are found cotton wood, ash, walnut, mesquit, alder and cherry.

The mountain mahogany is often over 30 feet high, and two feet thick at the base; the wood hard, dark, close-grained, and susceptible of a fine polish.

Mesquit grows only on good soil, reaches a hight of 30 feet, and sometimes a thickness of two, and is excellent timber.

Recently some attention has been drawn to an insect secretion claimed to have all the properties of the famous gum-lac of India, and found upon the *Larrea Mexicana.* It is known to occur abundantly in the region between Yuma and Maricopa Wells, and in some places the insects (*A. coccus*) are so numerous that the plants are killed by the complete coating of lac, with which they surround the branches. Lac has also been found on *Acacia Greggii*, another Arizonian plant.

On the dry plains grow palo verde, grease wood, the giant cactus and several other cacti. The palo verde is a mass of evergreen branches, crossing each other at irregular angles, and growing occasionally to the size of an apple tree. Not a leaf of any kind is to be found on this tree. Where a leaf should be, there is but a rigid twig.

The giant cactus, known as the Saguara, often grows to the hight of fifty feet—mainly a stiff upright stem—the hard portion of which, consisting of a number of woody bundles set around its circumference, is often utilized in building the rude dwellings of miners or ranchmen. The "galetta," "gramma" and "sacaton" grasses are abundant and nutritious.

A great variety of birds are found in southern Arizona, partaking of Sonoran types, while in the north the fauna generally is similar to that of Utah and Nevada, including the grizzly and black bears and the wild turkey. On the so-called "desert" of the Gila bottom, and southwest Arizona generally, beasts, birds and reptiles occur in quantities surprising to one who knows the scarcity of surface water. Rabbits, hares, coyotes, chipmonks, gophers and moles abound, and all live twenty miles or more from water. Quails also (which in California always live near water) are here found distant from it. Near water mocking birds and other songsters occur, and ruby-throated humming birds suck the flowers which enliven the oases. Three species of tortoise occur, and reptiles, snakes and lizards abound, including several kinds of horned hords, the Gila monster and rattlesnakes.

Climate.

There is considerable difference between the climate of the various sections of Arizona. In the north, around Prescott, the weather has been compared to that of the Eastern States, but the cold of winter is not excessive, owing to its low latitude. Snow falls, and ice forms from December to March, although it is seldom cold enough for the former to stay long upon the ground. All travelers agree in praising the clearness of the atmosphere, the beauty of the sunrise, and the superb coloring of the sunset in southern Arizona; and all have expatiated on the wondrous mirages of the dry plains.

A rain-belt comes up from the Gulf of California and passes along the central axis of the Territory, passing from southeast to northwest, but becoming narrower as it proceeds northwards and fading out near Prescott. The rains are semi-annual, summer and winter, and the total annual fall is from twenty to twenty-four inches. Tucson is just outside of this, but the valley round about is benefited by it. Around Florence the climate, though warm, is less so than that of southern California, or that of Tucson.

The Pottery at Lincoln.

Pure clays suitable for the manufacture of a superior article of pottery are not of very common occurrence in this State. At Lincoln in Placer county, is an extensive bed of excellent clay, near which is located the California Vitrified Iron-stone Sewer-pipe Works. This manufactory commenced work some four years ago, and was established by the present proprietors, Messrs. Gladding, McBean & Co., who had previously been engaged in the same business in Ohio. At first only sewer-pipe was made, but the demand soon exceeding the capacity of the works, they were greatly enlarged and the manufacture of other classes of pottery commenced.

The clay used comes from a hill about 50 feet high one mile to the north of the works. The deposit is about 30 feet thick and extending over a considerable area is practically inexhaustible. It lies very near the surface and is immediately underlaid by a stratum of pure glass sand. Below this, and at a depth of about 75 feet beds of a poor quality of lignite or brown coal are found. The rock formation to the east, and from the decomposition of which the clay was probably formed, is granitic. Neither the glass sand nor the lignite have as yet been utilized. A quantity of the former was tested in one of the San Francisco glass factories but did not, it is said, give satisfactory results. When the pottery was established it was expected to use the brown coal for fuel. Trial, however, showed that it was lacking in both amount and intensity of heating power; its use was therefore discontinued, and oak and pine wood used instead. The dry clay has a pure white color and is perfectly free from fragments of rock. As might be expected, however, a small per cent. of oxide of iron is present and colors the baked ware. If this were eliminated chemically as is done in some European potteries, the clay would be suitable for the manufacture of table ware. Properly prepared it is a fair quality of fire clay suitable for fire brick and lining furnaces, for which purpose it is used by the San Francisco rolling mills and the Selby smelting works.

The process of manufacture is the same as that employed in the Eastern sewer-pipe works, the preparatory washing of the clay being omitted. The dry clay is pulverized in what is called the Ohio pan mill, and screened to separate the coarse particles. It is then tempered or prepared for working in tempering mills. The charge is placed in a pan eight feet in diameter, and the proper amount of water added. Two wheels with a cutting edge, and so geared as to cover the whole bottom of the pan in their revolutions, and having stirrers attached to their axle, are now run over the charge. In about twenty minutes the wheels are stopped and the clay shoveled into shallow troughs, where it is beaten with heavy wooden mallets, to drive out air bubbles and make the temper uniform. It is now ready for working up. The sewer and chimney-pipe is pressed by a steam press, the cylinder of which is 40 inches in diameter and has 48 inches stroke. A two-foot section of pipe and its flange are now pressed in one piece, an improvement made within the last few years. The elbows, curved-pipe, chimney-tops and caps, and nearly all irregular forms are molded in plaster of Paris molds or by hand. The molds for some of the large and elaborate terra-cotta vases are very complicated and quite costly. Flower pots and some descriptions of small ware are made on the potter's lathe. Nearly the entire space on both floors of the main building, which is 216 by 40, is used to air-dry the pottery preparatory to burning. Sewer-pipe is glazed with a preparation called Albany slip, which is applied by dipping or "slipping" the air-dried pipe in the solution. Four large dome-shaped kilns, arranged with a downdraft, are used to burn and vitrify the sewer-pipe. They are 8 feet high inside, and range in interior diameter from 18 to 22 feet. The flame and heat of one of these kilns, after it passes into the flue, is carried through a kiln 14 feet square, in which the terra-cotta ware is baked. Considerable fuel is saved by this improvement, which has been patented by Mr. Gladding. About ten cords of wood are required for burning a kiln of pipe, which takes about 70 hours.

Lately experiments are being made with a view to making the finest varieties of terra-cotta ware. Copies have been made of antique vases, such as are used as grounds for painting and decorating. Though only experimenting, very encouraging results have been obtained. The vases and tablets, which are baked in *seggars* to keep them from the direct action of the flame, are of a rich cream tint and quite fine in texture. Acid tubs and pipes, previously all imported, are now being successfully made.

The sewer-pipe, the main product of the pottery, has already been mentioned. In addition to its use for sewers, it is excellent for the water works of small towns, for underground irrigation, and for wagon-road culverts. Its resistance to lateral and vertical strains is very great. In road culverts it has stood very severe tests, and for that purpose is much superior to wood.

GEN. JOSEPH W. REVERE, grandson of the famous Paul Revere, and attached to the Pacific squadron which took possession of California, died last week. Revere was the officer who first raised the American flag in California north of San Francisco bay.

The Construction of Carp Ponds.

According to a promise made in a late issue of the PRESS, we devote considerable space in this number to a recital of some of the requisites in the construction of carp ponds and the details involved therein. In making this showing we shall draw chiefly from the writings of Radolph Hessel, who was engaged by the United States Fish Commission to introduce the subject in this country. It would be impossible, of course, to give items of construction to meet all needs, for some may have one style of situation and others another. It will be our purpose more to present the main requisites, and these can be adapted to meet individuals conditions. The culture of carp in this State is spreading very rapidly, and the results already attained must be taken as evidence that the growth of the fish under California conditions is very satisfactory. This being the case we are disposed to aid the movement by the publication of useful information concerning it.

Localities Adapted for Carp Ponds.

If intending to establish carp ponds, it will be necessary to ascertain the following points before the execution of the plan:

1. Is there a sufficient quantity of water at hand for all purposes, for the summer as well as winter? 2. Is the ground, soil and water favorable for culture? 3. It is important to examine the land minutely, in order to find what are the components of the soil, for not every kind of soil is suitable for carp culture. 4. It ought to be decided from the commencement how large the establishment is intended to be, whether only for private use and pleasure, or whether wholesale production of the fish as an article of trade is contemplated.

A rocky, gravelly ground is not appropriate for carp culture. Sandy ground, without a considerable mixture of loam, clay and humus, is of small use. Small ponds with a sandy bottom may be improved by supplying them with loam, as it is frequently done in agriculture.

The most favorable water will always be that which comes from rivers and brooks. Ponds might be constructed which would fill themselves with rain water during the winter or at any other time; but such water takes a moldy taste easily, which it will communicate to the fishes, as does the water from hogs also.

In Europe, experience has shown that water coming from fertile fields and meadows, carrying with it particles of offal from villages, is best adapted for carp culture. Spring water direct from the ground is not favorable, and ought to be conducted, for at least a few hundred yards, through wide, shallow ditches, in order to receive more nourishing components from the air as well as the earth, and above all, to be warmed to some extent by the sun and warm air.

Construction of the Ponds.

Ponds must not be too deep, as the water will be colder and will harbor fewer insects, larvæ, and worms, which form part of the carp's food; besides, this fish does not grow quickly in cold water. A depth of 3 feet in the center of the pond is sufficient; toward the outlet-sluice it may be from 6 to 8 feet deep, but only for an area of from 200—1,000 square feet. In the depths of this "collector," the fishes seek their resting place for the winter, and also in summer, when the water is too warm near the edge. The collector is marked *C* in the engravings. The outer part of the pond should not be deeper than 1 foot for the distance of about 70 or 100 feet, so that the water there may be warmed more thoroughly by the sun.

Toward the center of the pond, and in accordance with its size, a cavity of from 20 to 50 feet in length and 2 feet deeper than the rest of the ground should be dug. This will serve the fishes for a resting place in summer and winter. These cavities are called "kettles," and are marked *E* in the cut.

The inflow of water into the pond should never be allowed to be direct; as, for instance, a brook falling into it. This often causes the water to rise at an inopportune time, carrying into the pond other fishes, especially the rapacious pike.

The inlet sluices from the stream must of course be of a strong and practical construction, so that an overflow is impossible, and they ought to be provided with gratings to prevent other fishes from intruding.

It is an indispensable condition for the culture in ponds, according to established rules, that they be so constructed as to allow of being thoroughly drained, so that the fishes may be taken out without any difficulty.

If the size of the principal and supplementary ponds has been decided on, the hight, depth and width must be measured, and the levels of the ground and dams, if such are needed, should be carefully taken. The leveling of the bottom is required to assist in the determination of the depth of the ditches, "kettles," collector and outlet to be dug in it.

Building the Dam.

In the erection of the required dam it is most important that it be constructed of the very best material, so as to make it secure against the destructive influence of the water. It ought to be three times as wide at its base as it is high, and at the top the width should be the same as the hight. The interior or water side should be less inclined than the exterior one.

Before the foundation of the dam is laid, the ground where it is to stand must be dug out to a depth of two and a width of from four to five feet throughout the whole length of it. If the ground does not consist of loam it must be filled up with it about one foot deep, and this must be tamped down hard. A second layer follows and is disposed of in the same manner. This is repeated, the clay being moistened every time if required, and then beaten down solidly. This lower stratum is but the foundation of the dam, which is formed from the earth dug out of the pond or its vicinity. This is continued until the dam is completed. Care must be taken, however, that the construction and tamping down of this lower stratum be done in layers

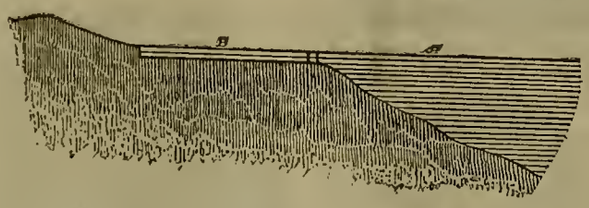

FIG. 1. CROSS-SECTION OF MIXED POND THROUGH BREEDING PLACE.

and that nothing but good clay be used. In this manner the material of the foundation will become a very tenacious mass, which will not allow any water to penetrate. The completion of this laborious task will be a source of ultimate satisfaction, as many disadvantages, which might arise after the filling of the pond, will be done away with through its agency. The dam should not be made entirely of clay, for in mid-summer, during the great heat, it would dry out too much on that side most exposed to the sun, and consequently it would become full of fissures, through which the water would escape, and this might become disastrous for the establishment.

Ponds Required.

To carry on carp culture in a regular and judicious manner, several ponds are required, according to the various purposes they are destined for.

1. The hatching pond.
2. The breeding pond.
3. The culture or regular carp pond.

The hatching pond serves more particularly for natural impregnation and hatching, or rather for natural propagation generally, by placing a number of male and female fishes in the pond. Here the females drop the eggs, during the spawning season, upon aquatic plants, where they are impregnated by the male.

The hatching pond should not be as large as the breeding-pond; its depth not to exceed 1 or 1½ feet. The outer portion, or, as it is termed, the low-water margin, should generally be from 2 to 5 inches in depth, and from 30 to 40 feet in width.

These ponds must be secured against the intrusion of pike, eels, bass, catfish, tritons, water snakes, turtles and water lizards, rats and water fowls, or any voracious animals. A fine grating will prevent the entrance of the former; against the latter, various traps are in use, and other means might be devised. It is of the highest importance that new ponds be assiduously kept clear of the animals mentioned, and of many others not named here.

Preparing Natural Ponds for Carp.

If it be desired to make use of natural ponds, it is necessary to ascertain whether they can be put into the proper condition for regular culture. This can only be done if the influx of water can be regulated and the entire drainage of the pond made possible. An intrenchment will be required with such ponds in order to make them dry. Trunks of trees should be taken out of them; and where they are too deep they should be filled up. If this is not done too many fishes will remain embedded in the mud when the pond is being drained, and this lessens the profits to a great extent.

Should any brooks fall into such ponds, as is often the case with large ones, they must be kept under strict observation on account of possible overflows which might occur. If it be practicable, the brook had best be turned off and conducted alongside the pond, when the latter can be supplied with water if required.

The fundamental rule in carp culture is that the water be of the same depth in summer and winter. If the supply of water is too plentiful, great quantities of mud are carried into the pond, embedding the grass which grows in it and on its banks; this, in consequence, will rot and poison the water. The carp immediately desert such water on account of its offensive odor, and retire from their proper feeding places to depths deficient in the production of food.

The breeding-ponds have the same construction as the hatching-ponds; they have dams, reservesluices, outlet-channels, collectors, and ditches in the bottom. The only difference is in being deeper and larger than hatching-ponds. They have an average depth of 1 foot 9 inches, and

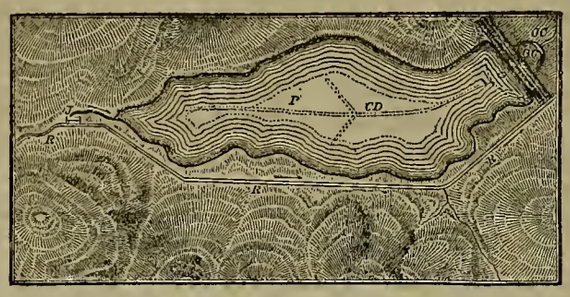

FIG. 2. PLAN OF A NATURAL CARP-POND.

the width of their shallow borders is from 70 to 80 feet. The "kettles" have a depth of 4½ feet from the surface; their borders are from 6 to 8 inches deep. The growth of grass should also be advanced in these ponds. In small ones of about 4 or 6 acres, the "kettles" may have a length and width of 60 to 70 feet.

Fig. 2 is a plan of a natural carp pond. Pond *P* is a natural body of water. Its extent is about 150 to 200 acres. It is formed by a dam, *D*, about 7 to 8 feet high, crossing the valley and thus collecting the water of a run flowing there. Before *D* is a deepening, *C*, the collector. In the dam *D*, there is an outlet leading to another deepening—the so-called outlet collector *OC*. The purpose of this collector is to

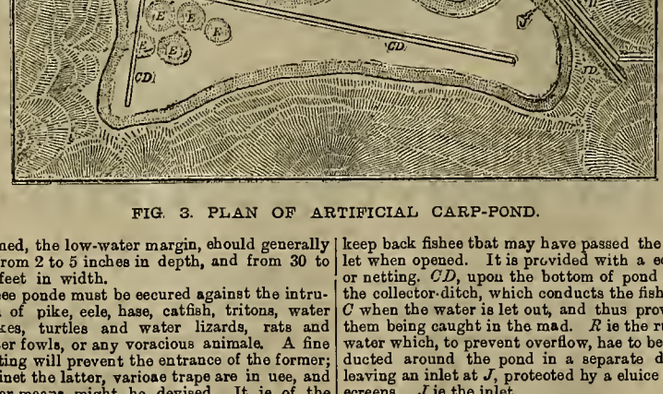

FIG. 3. PLAN OF ARTIFICIAL CARP-POND.

keep back fishes that may have passed the outlet when opened. It is provided with a screen or netting, *CD*, upon the bottom of pond *P*, in the collector-ditch, which conducts the fishes to *C* when the water is let out, and thus prevents them being caught in the mud. *R* is the run of water which, to prevent overflow, has to be conducted around the pond in a separate ditch, leaving an inlet at *J*, protected by a sluice with screens. *J* is the inlet.

Fig. 3 is a plan of an artificial carp pond. *R*, stream supplying artificial pond between undulating hills; *J*, inlet, *JD*, inlet dam; *CD*, collecting ditches; *C*, collector, *OD*, outlet dam; *O*, outlet; *OC*, outlet collector; *E*, cavities, "kettles," in which the carp collect for the winter; *H*, canal to let off surplus water in case of freshets.

As may be inferred from the above notes and diagrams, there is a great variety in the accommodations which may be provided for the carp. As we have described such as are laid down in the official reports, we shall now be glad to receive information of any especial adaptations which our readers may have made, so that those intending to try carp may have the advantage of a general recital of experiences.

Roasting Gold and Silver Ores.

Mr. Guido Kustel has just issued a new edition of his well-known work on "roasting of gold and silver ores, and the extraction of their respective metals without quicksilver." During the ten years which have elapsed since the first edition was issued, many improvements in the construction of furnaces, as well as in the methods of roasting, have been introduced. A great deal of new matter has, therefore, been introduced in the new edition, with new cuts of furnaces, etc.

Considerable space is devoted to the descriptions of the different modifications of the roasting of ore before leaching.

The "salving process" as now practiced is a very economical method for the extraction of silver. A comparatively small capital is necessary to build up such works; and hence there is a more reasonable ratio established between the amount of money which must be expended on the works and the real value of the mine than where expensive machinery is employed—a circumstance which is often a source of failure when insufficiently considered.

Mr. Kustel says: "The salving process is very simple and readily performed by common workmen. Besides the lime only brimstone must be provided, in order to prepare the necessary chemicals for salving and precipitation. It is a general, but erroneous, belief that the salving is a slow process. An amalgamating barrel is charged with 500 to 1,000 pounds of roasted ore, and treated at least six hours, and, therefore, turns out at most two tons in twenty-four hours, while a vat of proper size used in the salving process can work from four to ten tons in the same time. Only those ores are treated by this process which absolutely require roasting—a process with improved furnaces, not so expensive as formerly. The chloride ores alone can be leached directly without roasting, as thus where there is no other silver combination in them."

Mr. Kustel's new book is neatly printed and bound in serviceable covers. It is for sale by Dewey & Co., 202 Sansome street, San Francisco, for $3 per copy.

Water in Mines.

In deep mining the greatest item of expense is that of pumping. Not only is the necessary machinery very costly in the first instance, but it is expensive to run. It was principally to drain the mines that the great Sutro tunnel was run; but the water has to be raised in several instances from lower levels than that of the tunnel. At present, in the Comstock there is more water being raised than ever before. The situation in this respect is thus summarized by the *News* of the 28th:

The Union pumps at four strokes per minute, and with double columns of 14-inch plungers, 10-foot stroke, are raising not less than 921,600 gallons per day. Ophir and the C. & C. shaft are pumping also. The C. N. S. shaft yesterday lowered the water which flows to its pumps, including the recent influx from the Savage drift, 2400 level, about 13 feet. Its double column of 15-inch plungers, 8-foot stroke, are running 7 strokes per minute, and two bailing tanks of 1,100 gallons each are operated. The tanks raise to the surface, the pumps to the Sutro tunnel level. Together they raise 14,000,000 pounds of water per day, or 1,750,000 gallons. Savage pumps about 375,000 gallons and the Hale & Norcross the same. Jacket is bailing at least 240,000 gallons. The Forman shaft is raising 500,000 gallons and Belcher as much. Not taking smaller works into the account, over 5,000,000 gallons per day are raised. The Union pumps are draining the Sierra Nevada incline. The C. N. S. shaft pumps and tanks prevent work in Chollar and in the face of the drift for the Savage incline. Yesterday the sub-drain in this drift was completed and the water let into it. When it drains down, work there and in the Chollar drift will be resumed. When the Belcher can again take the water bailed by the Jacket, the Crown Point will begin connections on the 2700 level with the Jacket shaft. This means business. Belcher, like Chollar, can do nothing but pump. Compressed air cannot even be spared to resume work with on the 2760 level or to run the blowers to ventilate the workings there, which are very hot.

THE product of the Leadville mines for the 15 months ending April 1st was $16,147,131. The product of the same mines for the first quarter of 1880, included in the above figures, was $3,722,398, of which $581,788 was for lead, $11,436 for gold and $2,650,044 for silver.

New River District.

This district, situated so remote from the county seat as not often to he heard from, has nevertheless much occurring within its bonndaries that would he of interest to our readers were it only reported. Why some one of the many men located there does not take it upon himself to keep us posted on the affairs of that district we know not, hut certain it is that opportnnity is seldom afforded us otherwise to know anything of what is doing there. To Mr. J. M. B. Jones, who arrived here from New River, we are indehted for the following intelligence:

There are at present ahout 40 white men and 30 Chinese engaged in mining in the New River section and all are doing well. Among the more prominent of claims the following are especially worthy of mention: Jake Hirschberger, on the East Fork of the New river, ahout two miles ahove the store, is working alone with a hydraulic and is rewarded to the extent of eight dollars per day. The Thomas, Mill & Hardy claim, situated on main New river, hetween the Forks and Quimhy Flat, is now worked hy Noble & Mills, who make about five dollars a day ground-sluicing. John Victor & Co., a Portuguese crew of eight men, are working on Rattlesnake har, taking out $30 to $40 per day, averaging about four dollars to the man. They have been hringing in a ditch from the main stream, which will be completed hy the 1st of May and afford them greater facilities for ground sluicing hy furnishing a largely-increased supply of water. The Slide Creek mining company, on the North Fork of New river, have their mine well rigged with iron pipe and giant, and are making a good showing, a recent clean-up paying at the rate of $8 a day to the man. Sherwood & Brooks, who discovered the Blossom quartz mine, on Poney creek, last summer, have returned, and will prospect their find very thoroughly the present season, with every indication of striking a rich and permanent lode.—*Trinity Journal.*

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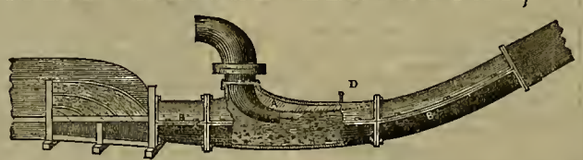
HYDRAULIC GRAVEL ELEVATORS,

For working flat gravel mines that have no dump.



Sluices gravel and water up hill on an angle of 45°, and will run any kind of gravel that will run in a flume. Handles rocks as easy as fine dirt, and will raise as much material as the water will carry off in a flume on 6 inches grade to 12 feet.
No bedrock cuts, tunnels or drains required. Machine a sufficient drain itself, and the process of mining the same as any other hydraulic mine. Is now a practical success in various places in California and Oregon. Send for descriptive circular to

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FROM 1-4 TO 10,000 lbs. WEIGHT.

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An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
12,000 Crank Shafts of this Steel now running proved superior to wrought iron.
CRANK SHAFTS, CROSSHEADS and GEARING, specialties.
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Mining Engineer,

Formerly Director of the Bureau of Statistics of the United States; Superintendent of the United States Special Commissioners of Mines; Member of the Committee on Mines at the Congress of Nations held in St. Petersburg, Russia; Mining Commissioner for the United States Monetary Commission; author of a History of the Precious Metals, etc.

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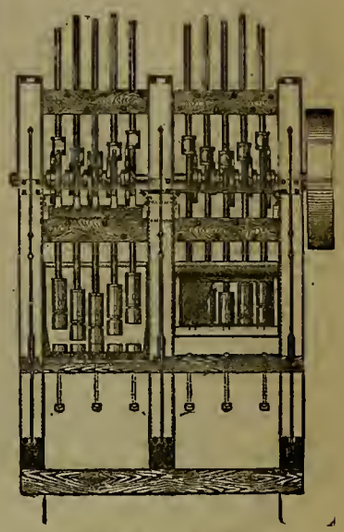

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Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.
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A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Hueme, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

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ORES SAMPLED, TESTED, ASSAYED.

QUICKSILVER

For sale in lots to suit by MAURICE DORE, Agent for the Ouadalupe Mine,
410 PINE STREET, SAN FRANCISCO.

CONTINUED FROM PAGE 277.

mining district, which has been lying dormant for several years, with but a couple of prospectors remaining at work there, is about to resume its former activity. We learn, from a very reliable source, that Felix Knight, who has been working alone in the old abandoned district of Silver Park for several years, has disposed of his mining interests at that place to Godbe & Co., of Salt Lake, for $20,000 H. Chandler has sold the old mill there to the same firm for $10,000. We understand that Messrs. Godbe & Co. have some Eastern parties interested with them and will at once go to work putting things in ship-shape and start the works. There has been a large amount of ore extracted and piled on the dumps. Silver Park is situated in the northeastern portion of Lincoln county.

ARIZONA.

GLOBE DISTRICT.—*Silver Belt*, April 24: At the Irene mill the past week work has progressed favorably; 16 men on the work, grading and masonry. The McMillen S. M. Co. have developed rich ore in the Florence mine. The Antler is producing well. When hoisting machinery, which is expected to be on the mine in 10 days, is in place, work will commence in earnest. A vein of metal was recently struck in a well 22 ft in depth which was being sunk in the rear of Hoffman's building, McMillen, that goes up into the thousands of dollars. The vein is now 2 ft in width, without the hanging wall being reached, and is evidently a spur from the Stonewall Jackson ledge. Chas. Sayre and J. S. Powers, if reports are true, have a large property on Pinto creek. From a 60-ft ledge, they have made frequent assays, going from 20 ounces the lowest, to 80 ounces, or an average of 40 ounces, which is big for such an immense body of ore. Machinery for the Golden Eagle 10-stamp mill has been passing through town during the week.

NEW GOLD MINES.—*Arizona Citizen*, April 24: We learn from Mr. Mercer, of Tubac, that a new discovery of gold leads has been made near that place. The rock looks well and quite a number of claims have been located. Near Guababi, about 17 miles west of Tubac, some recent discoveries of gold ledges have also been made, and a number of claims have been located and arastras are being put in place for the reduction of the ore, which is said to go $40 to the ton.

OUTSIDE CAMPS.—Cor. *Arizona Citizen*, April 24: I will now go outside of Tombstone proper, and speak of some of the camps near by. Quite recently there has been an excitement about gold quartz near Antelope springs, at the south end of Dragoon mountains. I have not been there, but am told there is a belt about 2½ miles in length through which run a series of veins that crop out with iron-stained quartz, and all carry gold. I am told upon reliable authority that some of the quartz will assay over $1,000 per ton in gold, and that the ore at a depth of 10 to 15 ft will average from $100 to $300 per ton. Mr. Kinkner, from New Jersey, has a company who are interested in the camp, and are well pleased with their prospects. Other parts of the Dragoon mountains are exciting considerable attention, as the assays begin to run up. Some of the claims were of exceedingly low grade at first, but grew better as the shafts went down. Some assays on new mines have exceeded $1,000 per ton, and strikes are reported almost daily.

GOLD FOR ALL.—*Arizona Miner*, April 23: Col. Moreland, the discoverer of the Tiger and many other of our best mines, arrived to-day, from Tonto Basin, where he has discovered the richest and most extensive gold diggings in the Territory. He has taken as high as $1.50 from a single pan of dirt. We are told that these diggings are 15 miles in length and considerable in width. We will interview the Colonel and try to give our readers his opinion to the premises.

PATAGONIA DISTRICT.—The ground in the vicinity of the old Mowry mill is being pretty thoroughly prospected, and several promising prospects have been discovered during the past month. The Mowry mine is thought to be a very valuable property; the average assay is not of high grade, but it is very easily worked. The main shaft on this mine is down 320 ft, and a large amount of ore has been taken from it, which was reduced at the old smelters of this place. The average yield of the ore for the first 200 ft was $40 in silver and from 25% to 40% lead. A large deposit was struck at a depth of about 250 ft which smelted from $60 to $300 per ton. Notwithstanding the many disadvantages under which the mine was worked it was made to pay.

DAKOTA.

BLACK HILLS NEWS.—*Times*, April, 22: Allen, Carlan & Co. have commenced their bedrock flume, operating in Deadwood gulch, and are working day and night shifts. The great drawback at present seems to be a lack of water, there not being half enough running in the gulch. Star & Bullock, Buckley, Williams and Rawsou are bringing in water on their claims. Nos. 13, 14 and 15, below on Deadwood, and expect to start their sluice in about 2 weeks. Drifting has commenced on claim No. 22 below, and we understand good pay is being taken out. The Caledonia 60-stamp and the Terra 30-stamp mills were running again yesterday.

LEXINGTON MINS.—This mine is in Spruce gulch, and is destined to be one of the bonanzas, but not until there are different arrangements made. When this mine was discovered the owners were poor men, and were not able to develop it on scientific principles as wealthy corporations do, but on the contrary, had to go ahead in the cheapest manner possible. A 10-stamp mill was procured and started, and has milled considerable ore with the most encouraging results, and now comes another calamity. Yesterday the mine caved in, but happily with no loss of life. The mine was developed by a perpendicular shaft, and at a depth of 50 ft the ore body, which we believe to be a true fissure vein, was struck and passed through; and after going down 50 ft further and finding no ore body, they ceased going down, and at the footwall of the ledge built a platform across the shaft, and started in stoping out the ledge, the ore being hoisted out by a hand windlas. The miners had drifted back on the ledge 25 to 30 ft, and about half as wide, and the full thickness of the vein about 15 ft. Yesterday the roof gave way, probably from not being properly timbered, and the whole thing came down. A tunnel will be driven in on this 50 level and the whole thing properly timbered and protected, and in a short time the Lexington will be in good shape.

IDAHO.

YANKEE FORK ITEMS.—*Herald*, April 15: Another rich strike was made Saturday last on Mount Custer. The quartz is as rich as anything yet found on the hill, ruby silver showing plentifully through much of the rock. The location was claimed by different parties, but a compromise has been effected. From the present indications there will be some very important developments brought to light on Custer this spring, and with the mines already opened and proven on the mount, the out-put of ore in the near future must give the Yankee Fork mines still further fame for quality and quantity. Operations are necessarily limited, yet the developments on the Lucky Boy mine are very satisfactory. Shaft No. 1 has reached a depth of 16 ft, showing a well-defined vein full width of the shaft; 3 ft of which is worth $350 per ton, the balance being fine milling ore. A new shaft (No. 2) has been started 180 ft east of No. 1, and though only a few ft down a body of ore has been struck almost as rich as that found in No. 1. The present showing makes this one of the most valuable mines in the district. Capt. Low is pushing the work, and will put on an additional force right away.

NEW MEXICO.

ITEMS.—*Arizona Citizen*, April 24: Experimenta are being made on the dry placer washings near Silver City. A party of Eastern railroad magnates have been junketing through the Territory. A rich placer mine is reported to have been discovered near the Bourbon, Cerillos district, from which a test pan is said to have yielded 35 cents. Las Vegas is quite certain that her Hot springs are unsurpassed. The Little Maud mine, about 2 miles east of Silver City, has been sold for $5,000, cash.

UTAH.

MINING ITEMS.—Salt Lake *Tribune*, April 22: Considerable mining property in the several mining districts of Beaver county are changing hands. Work on most of the old claims in Star district is to be resumed. The Milford furnace is being got ready preparatory to a fresh start. New strikes are being reported every day in Frisco district.

SILVER CLIFF DISTRICT.—*Prospect*, April 20: The Leviathan, between here and Rosita, has been sold to Cincinnati parties for $16,000, cash. There are now about 6,000 tons of ore on the dumps at the Bassick. The company is arraoging to erect a concentrator to be in operation by July. The Silver Cliff smelting company started up their furnaces yesterday. Messrs. Keath and Slosson yesterday bonded the Leopard lode, 12 miles northeast of town, for $10,000. The shaft is filled with rose spar and white quartz; at the bottom the mineral is much the same character as that found in the Diregо and Ben Franklin. At the depth of 95 ft, in the Lady Franklin, the ore is improving greatly. The Silver Cliff company's mill, during the past month, has milled about $35,000 worth of ore. Yesterday the Silver Cliff mining and milling company commenced operating their new tramway, running from the Racine Boy to the stamp mill. They have 3 cars on track, and will add 3 more as soon as they can get them here. When their train is completed it will convey 60 tons of ore to the mill daily. The ore they are now taking out averages about $50 in silver to the ton.

EL DORADO DISTRICT.—Silver Cliff *Prospect*, April 20: Mr. M. M. Giles, of the El Dorado mining district, paid the *Prospect* a pleasant call last evening. He is in high spirits over the prospects of his camp, and is confident that it has a future of unstinted prosperity before it. He is owner of the Alamosa, from which mine he has had assays running as high as $540. The main shaft is down 40 ft and has penetrated a 10-ft vein of decomposed matter carrying free gold in paying quantities, which can be sluiced out. Mr. Giles came over to the Cliff to procure lumber for sluice boxes, sieves and other things necessary for sluicing out the gold. He has been in the El Dorado district 5 years, and seems thoroughly conversant with the mineral formations of the Sangre de Cristo range.

News in Brief.

GOVERNOR FREMONT, of Arizona, is in New York.

PROF. NORDENSKJOLD has arrived at Stockholm, Sweden.

E. B. FRENCH, second Auditor of the Treasury, is dead.

THE Marquis of Ripon will succsed Lord Lytton as Viceroy of India.

A PARTY of Boston excursionists, numbering 100, have arrived in this city.

SEVERAL chiefs in Afghanistan favor an immediate attack upon the British.

THE output of bullion from Tybo for the month of March was $17,470.

THE annnal report of Gold Hill shows that the assessed property is $1,765,401.

THE salmon catch in the Columbia river has been very light so far this season.

A DOZEN Chinese are about to apply for naturalization to the New York courts.

ONE of the authors of the Winter Palace explosion at St. Petersburg has been arrested.

THE loss of stock in British Columbia from the severe winter will not be as great as anticipated.

THE United States frigate *Constellation*, with provisions for the suffering Irish, has arrived at Queenstown.

ANOTHER revolution in Port-an-Prince has been nipped in the bud by the imprisonment of the leader.

THE Governor has signed the McClure charter, an important measure for the citizens of San Francisco.

EXCITEMENT still prevails in Shasta county over the silver discoveries on McGee & Camden's iron mountain.

FRIGHTFUL wind-storms occurred in Wisconsin, Illinois, Kansas and Arkansas last week, doing immense damage.

JOHN H. BURKE has commenced another suit at San Francisco against the bonanza firm—this time to recover $10,429,000.

THE importation of neat cattle and swine into Canada from the United States has been prohibited by the Privy Council.

THE Pennsylvania legislative bribsrs have been sentenced to $1,000 fine each, and a year at hard labor in the Penitentiary.

CHINESE cruisers have captured some vessels in Portuguese waters, and a Portuguese vessel has been ordered to Macao, to investigate.

ACTUAL measurement shows that during the whole winter 441 inches of snow had fallen at Emigrant Gap and 522 at the Summit. At Truckee there has been about 300.

THE California pan mill and battery, says the Gold Hill *News*, are reducing 320 tons per day. The Bonanza mines are yielding this ore at the rate of 270 tons per day.

JOHN F. SWIFT, the California member of the new Chinese Commission, has arrived at Washington and has had interviews with Secretary of State Evarts, and President Hayes.

THE deepest vertical shaft on the Comstock is the Yellow Jacket, which has attained a depth of 2,936 feet, and which is being timbered and sunk at the rate of 27 feet per week.

THE Palace Hotel is having a boom. It is said that there are now over 1,200 guests in that house. There is probably no other hotel in the world containing so large a nnmber of guests.

REPRESENTATIVE PACHECO has introduced a bill in Congress to donate the military reservation at Camp Independence to Mono and Inyo counties for the purpose of establishing a High school.

FORTY THOUSAND pounds of hoisting and other machinery, for the San Antonio S. M. Co., Belmont, have just arrived at Wadsworth, from the foundry and machine works of Beckett & McDowell, Arlington, N. J.

FREDERICK VON BODERSTEDT, who is now Germany's most celebrated poet, will arrive in San Francisco in a few days. He is making a tour of America, and will visit the Germans of San Francisco for two or three weeks.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co, Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING APRIL 20TH, 1880.

226,705.—PLOW—L. Brown, Waitsburg, W. T.
226,712.—PREPARING BEANS, ETC., FOR FOOD—Wm. Butts, Petaluma, Cal.
226,653.—HITCHING HORSES—O. Dunkel, Eureka, Nev.
226,622.—TRACING WHEEL—D. W. Moody, S. F.
226,774.—SAW—E. Neuman, S. F.
226,678.—SAFETY POCKET—J. Rosenetock, Elko, Nev.
226,629.—BUCKLE—J. Rotherbucher, Virginia City, Nev.
226,679.—FIRE ARM—A. Schneider, S. F.
226,686.—SCRAPER—L. A. Sweatt, Santa Clara, Cal.
226,804.—CAN FOR BAKING POWDER—J. S. Taylor, S. F.

NOTS.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest ratee. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

HITCHING HORSES.—Oscar Dunkel, Eureka, Nevada. Patented April 20, 1880. No. 226,653. The object of this invention is to provide a device by means of which horses will be prevented from running away, either when left standing or in motion. It consists of a lever attached to the bed or body of the vehicle, and so connected with the single-tree and the horses' bits, that when left standing, in case the horses move ahead, their motion will operate the lever and draw their heads apart or together, thus checking them. Then when they back in obedience to the check they receive, the pull will be relieved. In driving the ordinary lines or reins are used; but in case of the horses attempting to run the driver can draw on the check rein, which is used with the lever, and may thus draw the horses' heads to either side and stop their onward progress, and this without reference to the driving reins. This device will effectually prevent horses running away. It is the work of a moment to attach the prevention rein to the lever when the driver wishes to leave the horses, and the moment they begin to move ahead enough to tighten their traces, they check themselves back by drawing on the lever and line. There will be no tendency to back too far, since as soon as their traces are slack again, the strain on their mouths is immediately relieved.

TRACING WHEEL.—Daniel W. Moody, S. F. Patented April 20, 1880. No. 226,622. The use of what are known as "tracing wheels," for the purpose of marking or tracing thin patterns upon a surface of cloth or other material, is common, these wheels consisting of a single star, having sharp points, and turning upon an axle properly supported in a frame, with a handle for convenience. When a pattern has been traced by this wheel it is necessary to mark out a line for cutting, which must be at such a distance from the pattern-line as will insure sufficient material to form the seam. This is either done in an irregular manner, without measurement, or sometimes by careful measurements at frequent intervals, and marking to indicate the points and guide the cutter. The invention consists in the employment of two parallel-toothed or star wheels, supported within a suitable bed or frame upon axles which are continuous or in line, so that when one wheel is made to traverse the desired pattern the other will form a line upon which the goods are to be cut, so as to give the necessary width for the seam.

WHEELED SCRAPER.—Leroy A. Sweatt, Santa Clara, Cal. Patented April 20, 1880. No. 226,686. This invention relates to certain improvements in scraping and grading machines; and it consists in suspending under suitable framing mounted on wheels an adjustable scraper so regulated and adjusted by means of levers that while scraping its rear end may be raised so as to bring it to any desired angle, and that when filled its front end may be raised so as to lift it, with a load, entirely off the ground. When in this position it may be carried suspended between the wheels to any desired point, where, by still farther raising the rear end, the contents of the scraper may be dumped. By this construction a convenient device is provided for leveling and scraping, and which also serves for conveying quantities of earth, etc., away from one point to another, and dumping it where required.

CULTIVATOR.—David M. Johnston, Red Bluff, Cal. Patented April 6, 1880. No. 226,321. This invention relates to certain improvements in cultivators, and consists in certain details of construction whereby choking and clogging of the teeth, when cultivating land that has a heavy stubble or undergrowth, are prevented. This cultivator is very light and, at the same time, strong and durable. The sections are made of wrought iron, and of heavy or light material, according to the land upon which the cultivator is to be used.

PREPARING BEANS, PEASE, ETC., FOR FOOD.—William Butts, San Francisco, Cal. Patented April 20, 1880. No. 226,712. The object of this invention is the preparation of those descriptions of vegetable alimentary substances which are gathered and stored in a dry state, such as beans, pease, lentils, etc., in order to preserve them unchanged in their nature for an indefinite period, and to render them at the same time available for use without the necessity of consuming much time or fuel in preparing for the table. The vegetables are obtained when in a dry state and soaked for a short time in clean water, after which they are placed in a close chamber into which steam is introduced. When sufficiently steamed they are placed in a drying chamber where they are kiln-dried, the water being removed by evaporation. When dried in this way, they are ready for market.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

Nothing short of Unmistakable Benefits

Conferred upon tens of thousands of sufferers could originate and maintain the reputation which AYER'S SARSAPARILLA enjoys. It is a compound of the best vegetable alterativee, with the Iodides of Potassium and Iron, and is the most effectual of all remedies for scrofulous, mercurial or blood disorders. Uniformly successful and certain in its remedial effects, it produces rapid and complete cures of Scrofula, Sores, Boils, Humore, Pimples, Eruptions, Skin Diseases and all disorders arising from impurity of the blood. By its invigorating effects it always relieves and often cures Liver Complaints, Female Weaknesses and Irregularities, and is a potent renewer of vitality. For purifying the blood it has no equal. It tones up the system, restores and preserves the health, and imparts vigor and energy. For forty years it has been in extensive use, and is to-day the most available medicine or the euffering sick anywbere.

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FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great Educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco.

METALS.

[WHOLESALE.]
WEDNESDAY M., April 28, 1880.

IRON.—	
American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	— — @35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 5½
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, ℔	15 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 16
Plow Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	— @— —
Bolts	38 @— 42
Old	— @— 13
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	6 @— 6½
Bar	— @— 6½
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck, " "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.—	
10x14 I C Charcoal	— @10 50
10x14 I C Coke	10 00 @10 00
Banca Tin	— @25 00
Australian	— @20 00
I. C. Charcoal, Roofing 14x20	— @10 00
" " " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, ℔, less than cask	10¼@— 11
NAILS.—	
Assorted sizes	6 50@6 75

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]
SAN FRANCISCO, April 28, 3 P. M.

SILVER, ½.
GOLD BARS, 890@910. SILVER BARS, 10@18 ℘ cent. discount.
EXCHANGE on New York, 25, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ℘ dollar; Mexican dollars, 90@92.
LONDON CONSOLS, 99 1-16; Bonds (4%), 102.
QUICKSILVER in S. F., by the flask, ℘ ℔, 42½@45c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending April 27, 1880.

HIGHEST AND LOWEST BAROMETER.						
Apr. 21	Apr. 22	Apr. 23	Apr. 24	Apr. 25	Apr. 26	Apr. 27
29.913	30.162	30.263	30.248	30.164	30.184	30.104
29.640	29.913	30.162	30.139	30.120	30.009	30.002
MAXIMUM AND MINIMUM THERMOMETER.						
58 / 52	58 / 47	58 / 46	62 / 48	57 / 46	60 / 47	58 / 48
MEAN DAILY HUMIDITY.						
78.3	73	71.3	75.7	76.7	78.3	87
PREVAILING WIND.						
SW	W	NW	W	W	W	SW
WIND—MILES TRAVELED.						
466	221	217	159	307	318	253
STATE OF WEATHER.						
Fair.	Fair.	Clear.	Clear.	Fair.	Fair.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.						
1.39	.23					

Total rain during the season, from July 1, 1879, 25.54 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, 420 Montgomery St.: San Francisco, Cal.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 29th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 41), levied on the Eighth day of March, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. Shares.	Amt.
Ashby, Mark T, Trustee	8	800	$80 00
Ashby, Mark T, Trustee	9	500	50 00
Ashby, Mark T, Trustee	10	405	40 50
Ashby, Mark T, Trustee	11	1000	100 00
Ashby, Mark T, Trustee	12	100	10 00
Ashby, Mark T, Trustee	13	200	20 00
Ashby, Mark T, Trustee	14	100	10 00
Ashby, Mark T, Trustee	15	100	10 00
Ashby, Mark T, Trustee	17	400	40 00
Ashby, Mark T, Trustee	18	100	10 00
Ashby, Mark T, Trustee	20	250	25 00
Ashby, Mark T, Trustee	21	50	5 00
Adams, Catherine S....	168	25	2 50
Adams, Catherine S....	169	25	2 50
Brayton, M L.....	246	2000	200 00
Brayton, M L.....	247	575	57 50
Cardwell, S A.....	292	100	10 00
Foy, C W	293	250	25 00
Glavich, M.....	45	30	3 00
Glavich, M.....	46	30	3 00
Goodrich, S S	142	50	5 00
Goodrich, S S	143	50	5 00
Goodrich, S S	144	50	5 00
Goodrich, S S	145	50	5 00
Goodrich, S S.....	146	50	5 00
Goodrich, George B....	179	50	5 00
Goodrich, Geo B.....	180	50	5 00
Goodrich, Geo B.....	181	50	5 00
Goodrich, Geo B.....	182	50	5 00
Goodrich, Geo B.....	183	50	5 00
Grant, R H.....	290	50	5 00
Harris, James.....	56	50	5 00
Harris, James.....	57	50	5 00
Harris, James.....	58	50	5 00
Holmes, George M.....	118	40	4 00
James, James.....	65	63	6 30
Jordan, Geo E.....	175	100	10 00
Jordan, Geo E.....	175	150	15 00
Lennan, Hosea H.....	184	50	5 00
Lennan, Hosea H.....	185	50	5 00
Lennan, Hosea H.....	186	50	5 00
Lennan, Hosea H.....	187	50	5 00
Lennan, Hosea H.....	188	50	5 00
Maxcy, S N.....	194	500	50 00
Maxcy, S N.....	195	500	50 00
Maxcy, S N.....	196	100	10 00
Maxcy, S N.....	197	100	10 00
Maxcy, S N.....	198	200	20 00
Maxcy, S N.....	199	250	25 00
Mead, L G	216	1575	157 50
Palmer, Wales L, Trus.	80	1000	100 00
Palmer, Wales L, Trus.	81	500	50 00
Palmer, Wales L, Trus.	82	500	50 00
Palmer, Wales L, Trus.	83	250	25 00
Palmer, Wales L, Trus.	265	2000	200 00
Smitherum, Samuel....	221	75	7 50
Swett, E C.....	294	125	12 50
Venning, John.....	63	100	10 00
Venning, John	64	150	15 00

Also, 460 shares of the old issue, equal to 2300 shares of the new issue of the capital stock of the said Gover Mining and Milling Company.

Name	No. of Certificate.	No. of Old Shares.	No. of New Shares.	Amt
Goding, E L.....	115	50	250	25 00
Goding, E L.....	254	25	125	12 50
Goding, E L.....	741	13	65	6 50
Godieg, E.....	143	50	250	25 00
Goding, Ephraim...	247	25	125	12 50
Goding, Ephraim...	739	20	100	10 00
Goding, Mrs E.....	740	12	60	6 00
Hildreth, Anna W..	647	25	125	12 50
Lennae, Lewellyn..	337	10	50	5 00
Lennan, Lewellyn..	517	10	50	5 00
Lennan, Lewellyn..	502	20	100	10 00
Lennan, Lewellyn..	679	10	50	5 00
Lennan, Lewellyn..	717	10	50	5 00
Lennan, Lewellyn..	718	10	50	5 00
Maxcy, Josiah.....	209	10	50	5 00
Maxcy, Josiah.....	590	100	500	50 00
Shaw, A W.....	382	5	25	2 50
Shaw, A W.....	485	5	25	2 50
Skinner, E O.....	620	50	250	25 00

And in accordance with law and an order of the Board of Directors made on the eighth day of March, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Monday, the third day of May, 1880, at the hour of one o'clock P. M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale. W. O. WILSON, Secretary.

Office—No. 402 Front street, room 8, San Francisco California.

Palmer Ice and Refrigerating Company.—Location of principal place of business, San Francisco, California. Location of works, 224 Fremont street, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of April, 1880, an assessment (No. 2) of $5 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 303 Montgomery street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the 24th day of May, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 17th day of June, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. C. C. PALMER, Secretary.

Office—No. 303 Montgomery St., San Francisco, Cal.

ANNUAL MEETING.

The Annual Meeting of the stockholders of the Original Gold Hill Gold & Silver Mining Company, for the election of a Board of Trustees to serve for the ensuing year and, also, for the transaction of such other business as may properly come before it, will be held on Monday, the Tenth (10th) day of May, 1880, at the hour of 2 P. M., at the office of the Company, Room 4, 300 California street, San Francisco, California. Transfer books closed on Friday, the Thirtieth (30th) day of April, 1880.

J. M. BUFFINGTON, Secretary.

Office, Room 4, 300 California, St., San Francisoc, Cal.

ANNUAL MEETING.

San Francisco Copper Mining Company.

The Annual Meeting of the stockholders of the above named Company, for the election of Trustees to serve for the ensuing year, and the transaction of such other business as may come before the meeting, will be held on MONDAY, the third day of May, 1880, at the hour of three o'clock, P. M., at the office of the Company, 258 Market street (up stairs), San Francisco, Cal.

P. SANCHEZ,
Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, Room No. 37, San Francisco, April 15, 1880. At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 54) of Fifty Cents (50c) per share was declared, payable on TUESDAY, April 20, 1880. Transfer books closed until 21st instant.

P. JACOBUS,
Ass't Secretary.

L. P. DECEN.

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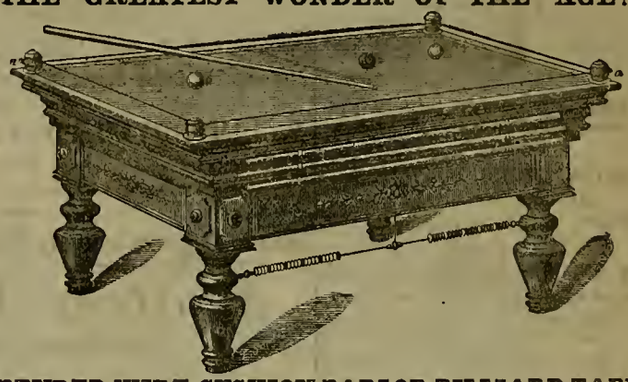

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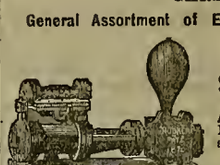

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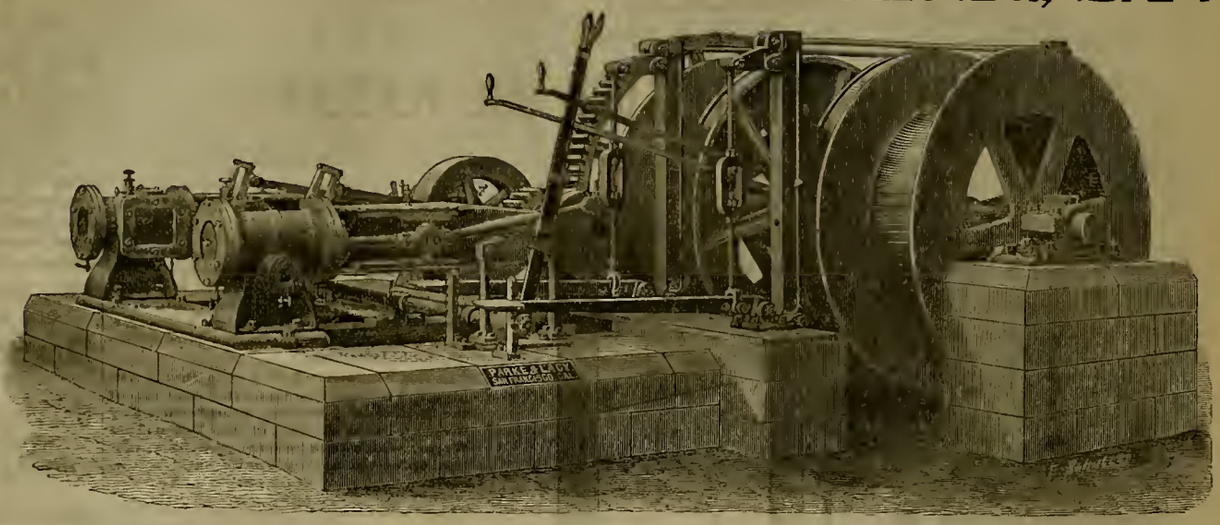

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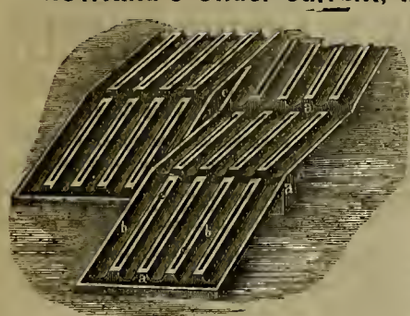

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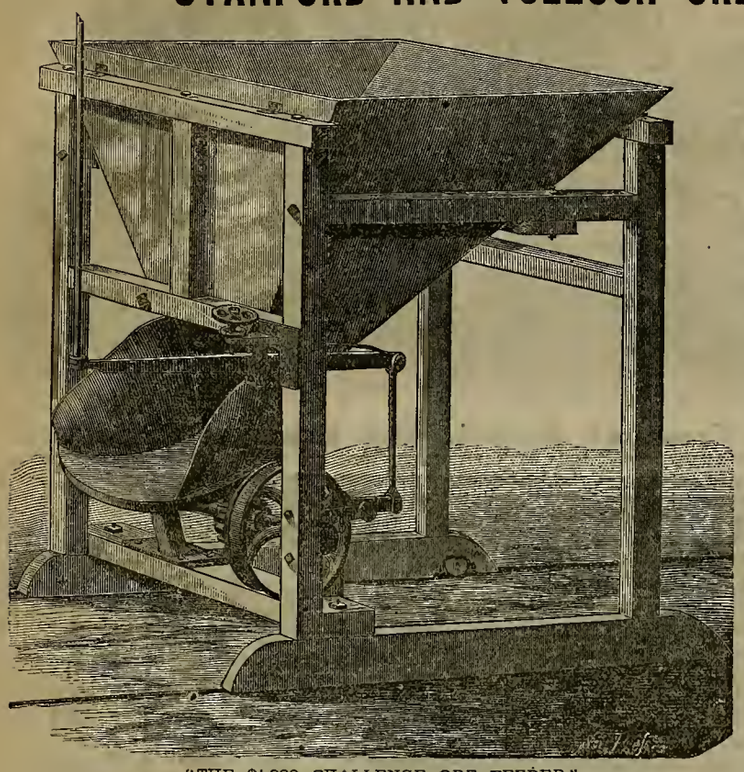

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By use of CHALLENGE ORE FEEDER there is 15 per cent. less wear and tear of iron than by hand feeding. There is also 20 per cent. more ore crushed.

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AND THE

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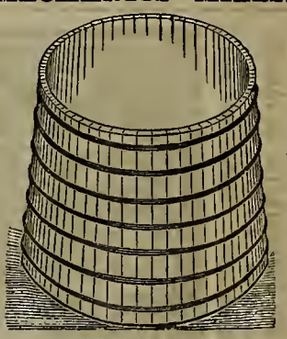

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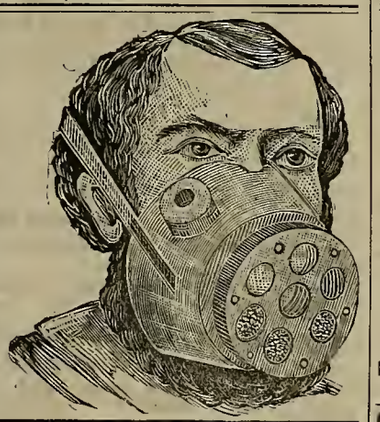

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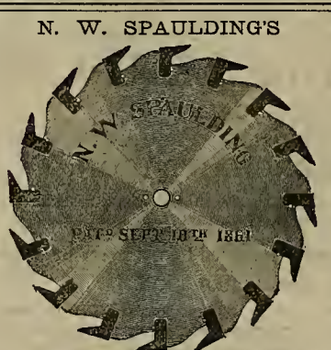

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, MAY 8, 1880. VOLUME XL Number 19.

Some Evils from which we are Exempt in California.

Doubtless there has been much written about California of an extravagent and sensational kind. That parties having land to sell, or being otherwise interested in promoting immigration have sometimes unduly magnified her natural advantages admits of no question, while tourists, traveling through the country at their ease, enjoying the best and seeing the bright side of everything, have, as might be expected, been voluble in her praise. But notwithstanding these too glowing accounts and occasional Munchhausenisms, there really is much in California that commends it as a place of permanent residence, especially to those with whom health and comfort are prime consideration. We have here our disadvantages and drawbacks arising from climatic and other natural causes. We suffer at times from severe droughts and local floods, and now and then from winters protracted and rigorous like the past. But these are attended with but little loss, and trifling inconvenience compared with the evils, varied and multiplied, that afflict our neighbors east of the Rocky mountains, and indeed most communities elsewhere, the world over. If we have drought they occur only at long intervals, and never extend over more than a portion of the State, the effective measures that are being adopted to insure extensive irrigation, operating to restrict every year more and more the area of country exposed to suffer from this cause. The damage arising from floods is inconsiderable, and even our severest winters cause but little loss or suffering, snow being a thing almost unknown throughout all the more densely populated parts of the State, our navigable streams never being obstructed by ice, and but comparatively little stock ever perishing from starvation or cold, though much the greater portion is never housed or foddered. The winter over, there ensues here a long season of warm and stormless weather during which neither man nor beast is likely to suffer much from cold, hunger or want in any form. It is a halcyon-like period covering some seven or eight months of calm and sunny days, free from blighting frosts, burricanes, and we may add destructive earthquakes as well, since viewed in the light of results, these may be classed among our most harmless phenomena. More lives were destroyed by the cyclone that swept over a Missouri village a week or two since than by all the earthquakes that have occurred in California since its first settlement over 100 years ago. Being never harmed by lightning we are free from that other and greater pest, the lightning-rod agent. Plagues and widespread epidemics in none of their forms ever trouble us.

How different with the people of the Western and Atlantic States! Their winters are terrible—almost arctic—and when over they have but brief respite from other meteorological troubles. The spring brings its cold drizzly rains, the summer its sun-strokes, thunder showers and fatal lightning, and the autumn its premature frosts and early snows, preludes to another long and dreary winter. The heat of summer is oppressive and debilitating, while the winter cold drives all in doors, to the great detriment of health, as well as business. The yellow fever desolates the cities of the South, while cholera in some form lurks in the cities of the North—disease and discomfort being every where the rule during the hot months of summer. From hurricanes they are never free, these happening whenever it suits their "own sweet will." The whole year seems, in fact, but a mournful procession of fresh evils, tribulations and sorrows, treading so closely on the heels of each other that the unhappy victim barely gets rid of one when another is upon him.

Now, we hold that it is worth something to live in a country free, or measurably free, from calamities and annoyances of this kind, and herein California offers inducements for settlement by people who appreciate exemption from this class of physical evils.

That this State offers other special attractions is also true, though these have been so often alluded to and so thoroughly advertised that we need not now expatiate upon them. A few words concerning our freedom from the bad climatic conditions above mentioned seem, however, opportune at a time when the whole world is suffering from frost, famine, pestilence and tornadoes, and so many strangers are flocking to our shores with the purpose of making here their future homes.

An Important Patent Suit Decided.

The "rivet" suit of Levi Strauss & Co., of this city, against H. W. King & Co., Chicago, for infringement of a patent for protecting the pocket-opening of garments from ripping, by means of rivets, has been decided in favor of Levi Strauss & Co. The action has been pending since 1876, and has been vigorously contested. Over 400 witnesses have been examined—from California, Idaho, Montana, Colorado, Minnesota, New York, Pennsylvania, and, in fact, from almost every part of the United States. The contesting parties have each spent upwards of $50,000 in the litigation. The testimony occupies 3,500 pages of fine type, and the argument of Mr. M. A. Wheaton, of this city, who managed the case for Strauss & Co., alone took 300 printed pages.

The patent thus sustained was originally taken out for Strauss & Co. by Dewey & Co., of the MINING AND SCIENTIFIC PRESS Patent Agency, and its standing the severe tests of the courts is a gratification to us. The patent was a very important and valuable one. The riveted overalls made under it are well known all over this coast among mechanics, farmers, and miners. In the decision, the court overrules the alleged defences, sustains the novelty and patentability of the inventions, holds the defendants to be infringers, and orders a decree against them for a perpetual injunction and damages.

THE House Committee on Commerce have agreed to insert in the River and Harbor Appropriation bill an item of $10,000 for commencing the improvement of the San Joaquin river. Page is endeavoring to obtain their consent to making it $20,000, which is almost all that could be advantageously used during the working season, but his efforts are impeded by the fact that Engineer Stewart's recommendation for this improvement is weak, having been made, it is understood, only under pressure brought to bear by Page's letter, asking that he be replaced by some engineer officer not unfavorable to this particular improvement.

THERE are about 37 men working in the El Dorado canyon mines, near Pioche.

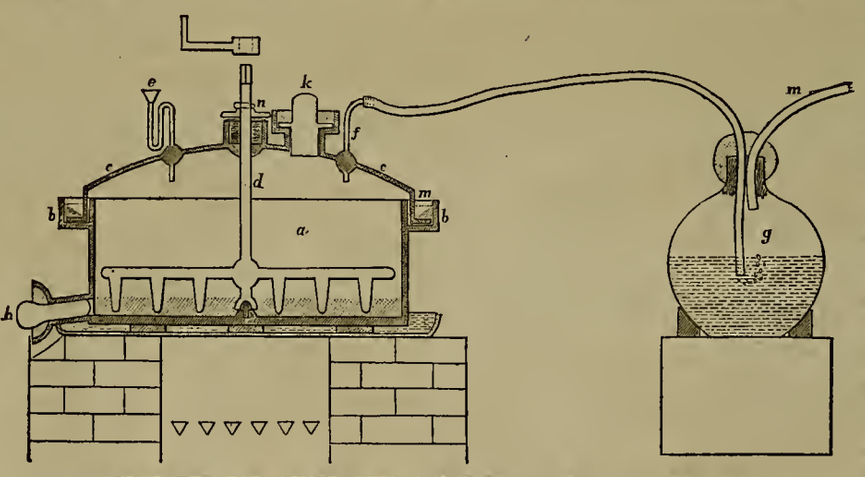
Production of Chlorine Gas for Gold Chlorination.

We take from "Roasting of Gold and Silver Ores," Mr. Kustel's new work, an engraving representing the appliance used for the production of chlorine gas, for use in works for the extraction of gold by chlorination.

The circular tub, *a*, has on the outside a circular ring, *b*, two and a half inches deep and two inches wide, for the reception of the flange of the cover, *c*. The cover is provided with a center hole for the reception of the stirrer, *d*, with a leaden pipe, *e*, bent in the shape of a letter ω, through which the sulphuric acid is introduced; another pipe, *f*, conveys the gas to the washing apparatus, *g*. At the bottom of the gas generator is an opening, *h*, for the discharge of the residue, and *k* serves for introducing the charge.

The cover is placed over the generator, the edge of the flange luted with clay, as shown by *m*, all around, and then filled with water, as indicated by the dotted line. The space at *n*, round the stem of the stirrer, must be filled with packing of cotton cloth strips saturated with oil, and the outlet, *k*, closed with a wooden plug wrapped, like the stuff-box, in cotton cloth, wrapped solid plug of lead, as above described, and luted with clay. The generator is placed in a square piece of boiler iron, the edges of which are bent up two or three inches to hold water or prepared for steam. The sulphuric acid is now introduced through the pipe, *e*, but not the whole amount at once; about 12 pounds to begin with will answer to create sufficient head to develop the gas, which escapes through *f* into the carboy, *g*, to be washed from acids. The gas should bubble through the water very lively; if not, the stirrer should be turned, and if this fails to produce the required effect, more sulphuric acid must be introduced, and repeated as often as the bubbling appears to become less active, always using the stirrer first. After all the sulphuric acid has been used up, the fire must be started till the water below the generator commences to boil. It takes about four hours to develop all the chlorine gas.

The rubber hose from the pipe, *f*, (⅜-inch hose), after being oiled inside, is inserted into the carboy one or two inches below the water; the other hose, *m*, conveys the gas to the chlorinating vat. Both rubber pipes in the neck of the carboy are wrapped in oiled cotton cloth, and all the space around packed tight with oiled rags, then covered with putty, as shown in the drawing. There is no necessity to change the water in the carboy often—once a month will do. The water through which the gas passes absorbs, if cold, about two and a half times its volume of gas, and is then saturated, but is still good for taking up muriatic acid.



APPARATUS FOR GENERATING GAS FOR CHLORINATION PROCESS.

The washing of the gas, to get rid of the small quantity of muriatic acid, is not so important, since, if a portion of this should happen to enter the ore, and, forming sulphureted hydrogen, precipitate metallic gold of that already chloridized, this would again be converted into a chloride in presence of abundant chlorine; but the washing is an indispensable indicator of the progress in the generator, by the more or less lively bubbling. Care must be taken to turn the stirrer from time to time, while the water round the generator is boiling, to prevent the caking of the ingredients.

If there is only one chlorinating vat, the gas from the carboy can be conveyed through one hose direct into the vat below the filtering bottom; but if there are several of those, it is better to fix a lead (¾-inch) along the vats, connected with those half-inch pipes before each vat, to which a piece of hose is attached. If not in use, the hose is withdrawn from under the filter, and closed with a stopper.

After the hose, *d*, has been inserted under the false bottom, the gas enters the space and rises slowly through the ore, until it reaches the cover, and commences to escape through the pipe, *i*. This is easily detected by the smell; but it frequently happens that although the smell denotes the escape of gas, it is sometimes difficult to find the point where it escapes. Ammonia, in contact with the smallest quantity of chlorine, forms a white fume, and it is the best medium to examine all connections therewith to find the escape of gas. If, in the generator, little gas is still emitted, this may continue; also, if all outlets in the chlorinating vat are closed. After this, water is admitted into the generator through the pipe, *f*, to fill up the space inside and to displace the gas. The plug, *h*, is then removed, and the residue discharged into a closed trough. In case the roasting is not properly done, it takes several pounds more of manganese, and the other materials in proportion, as well as more time for impregnation.

"Roasting of Gold and Silver Ores" is for sale by Dewey & Co., 202 Sansome street; price, $3.

THE sheft of the Dayton Gravel M. Co., at the mouth of Gold Camp, is now down to bedrock, about 24 feet. Work has been suspended until a pump can be put in. There is a four-foot streak of gravel which averages over 20 cents to the pan.

THE trail to the Skagit mines, via Hope, is said to be clear of snow.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Happy Camp, Siskiyou County, Cal.

[Correspondence of the PRESS.]

Mining on the Klamath—A Long and Rigorous Winter.

While we have had here along the Lower Klamath a winter of great length and unprecedented ssverity, it has not proved so detrimental to mining, our leading industry, as has bsen the case in most other parts of the State. It will generally be inferred that, because of our position so far north, we have here a rigorous winter climate; and so we have on the mountains, which cover seven-eighths of the face of the county. But the lower portions of the valleys of the Klamath and Trinity rivers hsing depressed almost to sea level and not very far distant from the ocean, enjoy a comparatively moderate winter climate, the suow never accumulating hers heyond a few inches, sometimes not so much as half a foot falling during the whole winter. This year we have had, however, over a foot of enow at this place, the weather meantime heing so cold that the water was frozen in the ditches, preventing hydraulic washing for nearly two months, a thing that never hefore occurred in this locality. Nearly every winter thie husiness is intermitted for a few weeks, usually in December or January, hecause of the discomfort of working during the cold rains, but not often, as has happened this year, on account of the ditches becoming obstructed with snow or freezing up altogether. For several weeks past hoth hydraulic and sluice washing have heen under full headway, and notwithstanding they have lost so much time, our miners count on making up for it in good part through an unusually abundant and prolonged water supply.

Extent and Character of Our Mining Operations.

Placer mining on the Klamath and its lower tributaries covers a linear extent of over 200 miles, reaching on the main stream from a point 20 miles ahove this place down almost to the ocean, a distance of 120 miles, and along Scott's river and the Salmon some 50 or 60 miles, some little work being also done on the smaller hranches of these several streams. We have here almost every form of placer mining—hydraulic, river-hed, hand and ground sluicing and some limited drift operations, much of the gold being now taken out hy the hydraulic method, carried on principally along the main river. The heaviest river-bed operations are on Scott's Fork, with Hamhurg Bar for their center. This description of mining has in that neighhorhood heen in progress for 25 years or more, having been continued from season to season, and heen prosecuted on a more extensive scale than at any other point in the State. Here can be seen great mounds of houlders piled up 50 or 60 feet high with pits excavated to hedrock, often 40 or 50 feet deep and hundreds of feet long. Thése pits are kept dry by huge pumps operated by undershot wheels set in the river opposite. Powerful derricks, used to hoist the massive boulders, swing them around and pile them up, creak here all the night long; operations never being for a moment suspended during the working season, which at hest is short and very uncertain, heing always terminatcd by the arrival of winter and sometimes hy untimely rains occurring hefore the advent of the regular wet season, and which, suddenly raising the river, floods the pits and sweeps away the derricks, wheels, tools and sluices of the hopeful miner just as he is about to realize some reward for his considerable investment and arduous labor.

The pits mentioned are sometimes sunk immediately over the suhterranean gold-bearing channels and reaching down to them, the latter are worked through these excavations. At other times the pits are sunk at the sides of these channels, which latter are then reached by tunnels through which their contents are brought out into the pits and then hoisted or in wheelbarrows brought to the eurface, where they are washed in sluices. The tailings after slacking, through exposure to the air for a year or two, are again put through the sluices, and pay well for rewashing.

Hand sluicing is, in this section of country, widely in use, hcing practiced hy the Chinese (here very numerous) almost exclusively. Drift digging, as before remarked, is not much in vogue. Of vein mining we have but little carried on immediately along the main rivers, the sites of this business heing on their various confuents, or in the valleys further back in the mountains.

The Principal Hydraulic Mines

In this vicinity consist of the Bailey ground, lying on the Klamath, thirteen miles ahove this place. The gravel here is rich, and the facilities for working it, so far as outlet and water supply are concerned, very superior. The claim is, however, but poorly fitted up, and has heen worked hut little, the owner finding more delectation in hunting than mining. In other hands the property could, with comparatively little outlay, he made to yield large net revenues. One and a half mile below the Bailey ground, Woods & Cramp are running 1,000 inches of water on a fine hank of gravel, and making big wages. One mile further down a company are piping and taking out a good deal of gold. They run 2,000 inches of water, taken from Thompson's creek, a large northerly confluent of the Klamath. Some eight or ten miles helow this point the Wingate and the Bunker Hill companies are each opsrating a prosperous hydraulic mine. Right at this place the Ferguson & Frazier company are running three giants and doing extremely well, their gravel heing of high grade, easily washed, and their mines equipped in the hest possihle manner. One mile ahove Happy Camp, lying on the opposite side of the river, is the Del Norte, or Richardson mine, also well opsned and outfitted, and producing gold dust at a rats that indicates for the property a large value. Here again, the yearly production made, amounting to some fifty or sixty thousaud dollars, could with a small outlay bs nearly doubled; but the owner is content with what he gets, preferring to lst a gang of Chinamen run his mins and pocket half the proceeds, while he gratifies his penchant for mechanical inventions, an occupation of which he is immoderately fond. As the fruits of this study, there are to he seen on these premises divers and sundry curious devicss, all ingenious and some very useful. Among other of these contrivances is a whsel, which, revolving in the bulk-head, carries on its periphery all the leavss, sticks and other ruhhish, floating on the water in the ditch and discharges them outside, thereby preventing their entering the flume, and being carried down into and obstructing the pipes. .This wheel acts perpetually, and performs a service, without being looked after, that would require thc attention of a man daily. Some improvements effected in the gravel-washing and gold-saving apparatus employed here are equally clever and even more useful, as they increase production while working an economy of hoth time and lahor. In short, our miner is a mechanical genius and bound to indulge his hent in that direction, even at the hazard of beiug plundered hy his Mongolian employees.

A Modern Icarius—A Flying Machine and What Came of it.

Dr. Degroot, while here last fall examiniug some of our hydraulic mines, related an incident that, occurring in his own experience, well illustrates the fonduess of our good-natured neighbor up at Del Norte for mechanical pursuits, showing at the same time that an inordinate indulgence of these tastes is with him no new thing. The Doctor, it seems, was eome years ago sitting alone one day in the editorial rooms of one of the leading newspapers of San Francisco, when there entered a hroad-shouldered young fellow with a pleasant, manly face, who, in a hesitating sort of way, inquired: "Be you the editor?" Thinking, from his appearence, the stranger might he a miner from the mountains, the Doctor replied: "Well, not exactly, though I sometimes grind out a little matter for the mining department of the paper—got some items in that line?" "Well, no, not exactly in that line, but I can *fly!*" "Ah! I see an angel, and a pretty robust one, too; but where are your wings?" "Well, they'r down ou the machiue—gulls' wings—ahout 50 pairs of them, dried and wired on." "Ah! that's it; you've constructed a flying machine—eh?" "Yes, that's it, and I thought of taking it out tomorrow and making a trial of it. Would like to have some of you newspaper men go 'long and see how she performs; if good, then you might say something about it. If she don't go off right, why then I guess the less said about it the hetter."

Having thus explained the ohject of his visit and obtaiued the Doctor's consent to go with him early the next morning and witness a first trial of his ærial apparatus, Richardson, for he it was, suggested that it would perhaps he as well for the "Editor," if at leisure, to go down and take a look at his invention beforehaud. This being assented to, they twain took their departure and, proceeding to a dilapidated building standing on the south side of Jackson street, between Front and Battery, entered and, ascending a flight of stairs, passed through a hall and down a ladder at its further end into a vacant rear room. Here Richardson, pausing, explained that he had adopted this method of ingress and egress as a means of preveuting anyone seeing what was going on in the huildiug; adding, that he had thus far kept his invention a secret and wished to so preserve it until he had made a practical trial of its merits. This over, Richardson opened the well-secured door and ushered his guest into a capacious, rough-hoarded apartment, that had long served the purpose of a carpenter shop.

Here, occupyiug a good share of the otherwise empty space, stood, stood the handi-work of the stout young man; one of those things that once seen, is not to he forgotten. A framework, 18 feet long, 6 feet wide and 6 feet high, had heen constructed of bamhoo sticks firmly wired together. Extending along and on each side of this structure were rows of gulls' wings, attached in pairs to slender hamhoo poles, one row ahove and one below. These wings, which had heen dried with such care as to preserve their natural shape, were, by an ingenious and complicated gearing, so arranged that they could he made to flap in concert, the upper rows being worked hy the hand and the lower hy the feet of the operator acting on treadles.

Having pointed out with much volubility, how man when essaying locomotion in a new element should imitate nature, employing the wing of the bird if he wishes to fly, copying the movements of the aquatic fowl if he desires to swim, pattsrning after the snout of the swine whsn he would root, etc., the builder of this outre contrivance got him into the harness and working his arms and legs vigorously, produced a fluttering and din like a myriad wild geese put to sndden flight. This over, the two separated with the understanding that they were to meet at the same place early the following morning when the machine was to he subjected to a more crucial test, the inventor having already employed men to carry it out to a suitable spot fixed on for the purpose.

At pssp of next morning all were on hand, and the end of the huilding having besn removed the four stout Irishmen provided for the work, took hold, one at each corner of the ark-like structure, and started with it on a trot up ths middle of ths street, Richardson urging them the while to quicken their pace that they might get outside the town before there were many people astir to observe them. The place selected for the experiment was a steep hluff, overlooking the hay in the vicinity of Black Point, its sides covered with hrush and its hase close to the water. By the time the procession had reachsd this spot it was broad daylight, and the people living in the scattered cottages near hy, having caught sight of the well-plumed frame work which doubtless they mistook for a new style of hearse, hsgan to peer at the party through the windows, some coming out and staring at them in a way not at all pleasing to the principal actor in the husiness, who lost no time in getting into the machine as soon as it was set down on the edge of the hluff. The assistants were hurried to their places, one at each corner, and instructed to give the thing a boust when all was in readiness.

Now the adventurer in this flighty enterprise having counted much on assistance from the wind in hie first efforts to mount from the earth, was pleased to find it hlowing briskly at the time; and having waited a little for it to freshen up, when a pretty stiff hreeze came swecping hy, helieving the opportune moment had arrived, sang out "Hoist away, all hands! Good-bye hoys till I see you again, for there's no telling where I may light;" whereat the quartet of Hihernians lifted sturdily, each at his corner, while the aeronaut floppsd the entire set of wings with all his might. Under these combined efforts up wcnt the machine with its precions freight, ascending steadily until it had reached a hight of some 40 or 50 fcet, when a sudden gust of wind getting under the concern, turned it up side down, so reversing the order of things that the occupant's fcet were brought into position where his head onght to be. That he was not spilled out entirely and dropped to the earth in advance of the less pouderous mechanism was due to his limbs becoming entangled in the wreck, hy which he was saved from a more hasty descent. In good time, however, the whole establishment reached *terra firma*, alighting on the side of the bluff, down which it rolled crashing through the hrush in a confused mass to the hottom. The assistants and some others who had hy this time gathered on the hrow of the hill, having good reason to helieve the aeronaut killed outright, remained for the moment awe-stricken and silent, and, not till Dr. Degroot, hurrying down had found the young man hut little hurt, did the crowd ahove give vent to the feeling which such a ludicrous scene was calculated to inspire. Richardson, who was not seriously injured, though badly scratched and nearly stripped of his clothing, comprehending the situation, cried out to the doctor as he approached, "For God's sake cut away these traps and get me out of this as quick as possihle." This done the two seized hold of the wreck and dragging it to the water's edge threw it in, leaving it to he hy the receding tide horue away, while they, keeping out of sight under the hluff, hastened hack to town; Richardson, satisfied that the results reached, if they did not wholly upset his theory, were at least of a negative kind, and the Irishmen on the hluff satisfied that they knew exactly where the aerial navigator had alighted.

This incident, Dr. Degroot had, according to promise, kept to himself until he came up here fast fall, when Richardson, who with lapse of time had grown less sensitive on the suhject, himself alluded to it in a jocular way, removing the injunction to further secrecy. Should this account of the affair find a place in your columns it will he the first time it has ever appeared in print or in any way attained publicity, though it douhtless occurred as ahove related, or as nearly so as I can now recall the circumstances as given hy the narrator. X. Y. Z.

ANOTHER JOINT SHAFT.—The Mackey gold and silver mining company and the Essex gold and silver mining company have filed for record an agreement to sink a joint shaft at Cedar hill, near the Phil Sheridan works. The Mackey agrees "to commence forthwith the sinking of the said shaft, and to carry on said work with all reasonahle dispatch for the period of one year, and to furnish and advance all money that may be needed to carry on and prosecute said work at its own cost, and to furnish and do all things necessary thereto." The Essex agrees "that it will during the said period leave the control and management of the said work entirely to the said Mackey company, and upon demand at the expiration of one year from this date reimhurse one-half of all costs so incurred and moneys expended." The shaft is to be the joint property of the two companies, and to he used in common hy them for the development of their respective claims.—*Gold Hill News.*

Gold Hill.

A Chat with One Who has been There.

A Silver Cliff *Prospect* reporter, while on an excursion for news, met Mr. S. Wallace, who was in charge of a stamp mill at the ahove named place, during the greater part of last summsr. After introducing himself, the news fiend set his rsportorial smeltsr to work, and at the end of the "run" cleaned up the following budget of facts concerning the Gold Hill camp. This camp lies at the mouth of the canyon through which the limpid watsrs of the classio Cottonwood break from their mountain confines into the San Luis valley, and was located some four years ago. Shortly after its location a mill for treating its gold-bearing rock was erected and rnn for some time, hut proved a failure. From rock assaying way up in the thirties, not more than $10 psr ton could be extracted hy this mill, and the pioneer prospsctors and minsrs became sorsly discouragsd and gradually drifted away to other and more promising fields, till ths camp was almost deserted. About one year ago, however, new prospectors entered the forsaken field, and gave the place new life and activity. New discoveries were made, new mines opened, and the old mill was set in mqtion again, by Mr. Wallace and others, hnt somehow or other they could not induce the mill to extract mors than $10 worth of the coveted metal from a ton of ore. It was emphatically a $10 mill, and after running it during the summer, Mr. Wallace left it to rest and rot under the touch of time. But this time the failure of the mill did not discourage the mine owners, and they still hold to their property, and cling to the belief that a world of solid wealth lies entombed in the mass of gold-hearing rock of that vicinity. They were convinced hy assays that their ore will yield gold in paying quantities, as soon as the proper treatment can he discovered, and the necessary machinery he introduced in the camp. Col. Carter, of Philadelphia, has undertaken to supply this want, and will, Mr. Wallace thinks, first try what is known as the Walker, or Lightning process, and in the evcnt of this proving un-uccessful he will make special adaptations to the ore. The contract for the lumher to be used in the construction of this mill has heen let and a saw mill has been erected especially for the purposc of getting out this lumher.

The principal mines of the camp are Bonanza, Hidden Treasure, Alamosa, Eastern Star, Great Wonder, Hematite, Saxon, Christone and Ohio. Three or four of these have been worked all winter. A numher of assays from these mines have, says Mr. Wallace, run as high as $40 to the ton in gold, and one assay went as high as $600 to the ton, hut Mr. Wallace was frank enough to say he did not consider ore of such value superahundant in the camp.

A mill run of ore from three mines, one at Gold Hill and two at Christone creek, five miles from the former place, has just heen completed at this place, and ran respectively two, three and five ounces in gold to the ton. A load of ore containing 2,500 lbs. and brought over from Gold Hill some time since, is reported to have sold for $200, but how much truth there is in the report we are not prepared to say.

The camp is easy of access from Alamosa, the road running along the San Luis valley all the way. The distance is 40 miles, and from the latter city the camp drawe the larger portion of its supplies.

In point of altitude Gold Hill is about on a level with Silver Cliff, and has a good climate. There is an ahundance of pinon pine for fuel within a convenient distance of the camp, and a good supply of light spruce suitable for lumher.

KING CARBONATE.—With the mining people East, carhonate-producing mines are in greatest favor. One correspondent complains that no other class of mines stands any show. This all comes of the fact, of course, that the Eastern people have acquired all of their notions of mining from Leadville. On the same ecore Eureka should he immensely popular heyond the Missouri river. We have here the richest and most extensive carbonate deposits that have ever heen brought to light in any part of the world. But the Eastern public is wrong in restricting purchases to carhonate properties. There are other classes of mines equally productive and permanent, and fully as desirahle. *Eureka Sentinel.*

INSECT LOCOMOTION.—M. G. Carlet, of France, has heen studying the locomotion of insects and arachnids, and reports as the result of his ohservations that the walking of insects may he represented hy that of three men in Indian file, the foremost and hindmost of whom keep step with each other, while the middle one walks in the alternate step. The walking of arachnids is represented hy four men in file, the even-numhered ones walking in one step, while the odd-numhered ones walk in the alternate step.

ROTARY STEAM ENGINE.—An Indiana exchange thinks that the prohlem of cheap steam power has heen solved hy a couple of ingenious mechanics of Windfall, Ind., who have invented and patented a ncw rotary steam engine, which is said to he a marvel of simplicity and power. A ten-horse power engine of this pattern has heen manufactured and put in operation. It is said to occupy less than a cuhic yard of space, and weighs 350 pounds. The net cost of construction, with very inadequate facilities, was $90.

MECHANICAL PROGRESS.

Furrowing at the Joints of Steam Boilers.

Probably the most important practical inference to be draws from the tests of the strength of rivsted joints, is the explanation which they furnish of the failure, hitherto unexplained, of boiler-plates, not at the joints, but in their neighborhood. It is well kuown that some process knowu as electric or galvanic actimn produces pitting and furrowing from copper oxides, derived either from the copper feed-pipes or the brass tubes, and held in solution, the oxide acting with acids or salts would produce the furrowing.

In Sonth America and the West Indies the atmospheric influences have a very intense destructive action on boilsr-plates; the tube-sheets of some of the engines, after running only a few ysars, conld be dug into holes with tho nail. Thie action is known in the marine boiler hy the pitting nver the furnace tops, owing to the action of the feed water from the surface condensers. The old jet condensers had the blame of wasting the fuel, but the surface condensers certainly wasted the plate. One reason of this may be that the water does not contain snfficient salt ae to dsposit a scale sufficiently thick to prevont the action of tho oxides held in eolution.

Tho brass tubes of snrface condensers and boilers, if of brass, shonld be tinned before heing fitted intn the boiler. However, it is well known that boilors, whether stationary, locomotives, or marine, fail by corrosion aud other agencies pitting and furrowing the surface of the iron. This pitting nf the metal ie readily explained hy the presence of metallic oxidss or salte held in solution in the water, and by the known inequality of mstal, nnequal expansion, etc., whereby the iron is gradually weakened, separated and diseolved; and probably a weak galvanic current may be established between the iron ehell and the brass tubes, thus hastening the powers nf destruction. But this does not meet the case of a straight furrow along a seam, cut like a groove along the surface. Furrows are eithsr parallel and close to a joint, or concentric and close to a flange, such as that of the feed-pipe, scum or blow-off. In no case are they found at sny notable distance from a seam, joint, or flange, or otherwise than parallel to thsm. The inference that a relationship exists between the parts mentionsd and the furrowing of the plats is strengthened by the fact that, as the groove or furrow is not found in welded shells, and the differential expansion of the seams heing douhle that of any other part of the plate, unequal cooling aud heating when getting np steam and blowing-off, produces an unequal tension and a relaxation of the joints, attended with distortion, bending and unbending of the plates on each side of the joint, the consequencs being that the metsl is gradually weaksned in lines parallel to the seam, and is thns exposed to corrosive actien. On this theory, the furrowing having first established a weak place, the corresive action being concentrated thsre, would suffice to extend and deepen tbe groove thue formed to dangerous limits, occasionally producing explosions. Any echems that will lessen these dreadful catastrephes should be adopted by every one taking part in the bnilding or management of a boiler. A welded steel shell would be entirely free from fnrrowing, as it would be frse from inequality of distrihution of metal. Thoss who are familiar with boiler explosions will have observed that the plate always rips along a ssam, and parallsl to it.

The weakness attendant on lap-joints is strikingly exemplified in the lap-welded seam, when enbjected to extreme tension, though the metal at the weld is perfectly solid, and fully as etrong in itself as the body of the plate In this cass, there is no elementary weakness iu the reduction of metal by rivet-holes; and the inferiority of strength arises solely from the bending of the plates on both sides of ths lap, and the over-straining of the fire-box in the endeavor to attain a position of stahility. The cause of furrowing may therefore be said to be a mechanical, and that of pitting a chemical one. Mr. John Sewell, in commenting on the corresion of locomotive boilers, ascribes the furrowing of plates at riveted seams to the interruption of the vibrations nf the boiler by these seams, the localization of the fatigue at these places, and resulting increased eusceptibility to corrosive action.* This action has, douhtless, a tendency to aggravate the evil of lap-jointing; but we are disposed to ascribe the evil to the lateral hending and unhending of the plates as the primary canss.

The furrowing of lap-jointed plates teaches an important lesson on ;the practical value of direct connection by means of butts, or butt-welds, in exerting, transmitting, or resisting forces.

That tbe furrowing of the plates at the riveted joints results from the inclination of the strain, is rendered still more probable by the analagous furrowing which results from reciprocating strsins of another kind. In the older classes of engines, in which the cylinders were fixed to and worked from tho smoke-box plates, the alternate forward and hackward movements and strain producsd by the steam-pressure on the piston havs been known to wsaken and subject to corrosion and leakago the substance of the plate along the edge of angle-iron at the junction with the barrsl. Mr. Cnlburn states that he is not aware that any accidents from furrowing of boiler-pletes have taken place in the United States; and this no doubt arises from the use of vsry thin boiler-plates, not more than one-quarter to five-sixteenth inch thick. Steel nf this thickness butt-welded would carry twice tbe pressure, and would bo entirely free from the vice nf furrowing; the mechanicsl and chsmical properties of such a boiler would be homogensous, assuming, of cnurss, that the tubes, stays, and evory part are of steel.—*Universal Engineer.*

* "As riveted points destroy the elastic homogeneousness of the boiler, the waves of expansion, contraction and vibration are arrested at the seams by the greater rigidity of the riveted double thickness of metal, which tends to localize the fatigue sustained by the iron near these joints, and it also appears to increase the susceptibility to corrosive action, since the furrows take the line of fatigue, and are often deeper than the spots on the plates." Report of Board of Trade on Railway Accidents, 1855, page 49.

Annealing in Boiling Water.

An English expert on motal working, Prof. W. Mattieu Williams, says: "I will narrate eoms curious experiments that I commenced when in Sheffield, but have not setisfactorily compksted. They were made at the suggestion of Mr. William Bragge, then a managing director of Sir John Brown'e works. He had learned that the stesl wire springs of pianofortee are annealed by what appears a very ominous process, viz., by making tbe wire red hot and then plunging it into boiling water. Ordinary experience would euggest that this mnst harden the eteel in some degrse, hut I tried it upon many samples of eteel—mild Bessemsr eteel, shear steel of different qualities, and the herdest old-fashioned Sheffield 'pot steel'—and found that in every case, when the operation was properly performed, the steel was remarkably annealed. I compsred samples cnt from the same bar—one heated and slowly coolsd by hnrying in ashes under a furnace grate, the other by immsrsion in boiling water—and found that when subjected to bending tests, those which had been cooled in boiling water would bear a more severe degree of flexure without cracking than the pieces which had been more slowly cooled in the ashee. They were not so soft, as tested by the touch of the file, but unquestionably tougher and more reliable when subjected while cold to violent bending blows of a hammer. It was more effectual than any device of 'oil-toughening' or slow cooling I have had opportunities of testing.

"Certain precautions are necessary. In the first place, the water should be quite at ths boiling point and the stsel at a bright red heat; and, secondly, the steel should be fairly surrounded by the water. The conditions heing fulfilled, the steel remains red hot under water for some time. It is evidently surrounded by a film of vapor, aod is not in actual contact with ths water, which assumes the so-called 'spheroidal state,' continuing in this condition until the metal has cooled considerably. I snspect that the toughening is due to the uniformity of cooling thus effected."

Horse-Shoeing.

As there have been many theeries in shoeing horses for the benefit of tho horse and its owner, which have not proved satisfactory in all cases, I will give you the result of my sxperience in horse-shoeing for the last 30 yeare:

First notice the way the horse stands. If his feet are stretched forward it denotes that the ehoes hear too much at the heel. Remsdy: Pare the foot considerably at ths toe, hut very little at the heel. Joint the foot, after it is pared, with the rasp, and see that you havs an equal bearing all around the foot. Have the shoe concaved back to ths last hole in the shee; then level back to ths heel calks. Whsn the shoe is set, have tho crust at the heel about midway of the width eide of the shoe. Commsnce nailing at the toe, one nail on each sids alternately.

Second: If his toes incline toward each other, set the ehoes pointing straight forward and trim the toe on the inside, which will prevent his hittiog the other foet and stumbling. Shees in all cases should be of good length. Work and eam horses, in eummer time, should be well calked half sharp.

Third: To prevent overreaching, longer shoes are necessary on the forward feet. The outsido corner at the heel should bs rounded out to prevent chafing the hind foot. Set the shoe on the hind foot back so that the foot may project over the shoe nearly half an inch at the toe. You will tben be rid of that painful and disagreeable ttune at every step, click, click, click.

For roadstcrs, in summer time, I prefer the slipper shoe, thick at the heel, with medium size toe calk. To prevent interfering, pare the foot a little, the mest on the outside. This will have a tendency to roll the ankles furtber apart. A side calk on the outside heel will prevent the feot sliding under as it touches the ground. Set the shoe pointing etraight forward with the foot projecting over the shoe as in other cases.—*Cor. Blacksmith and Wheelwright.*

Overheating Steel.—It is sometimes said in regard to overheating steel, that too frequent heating with high heat extracts the carbon, thus rendering it somewhat like iron. In regard to this matter a correspondent of the *Manufacturer and Builder* eays: "What we call burnt steel has just as much carhon in it as the steel that has not been hurnt. This was proved by experimente made upon samples which were analyzsd by Prof. Albert R. Leeds, of Stsvens Institute. He fonnd that ths amount of carbon in a piece nf steel which had bean purposely burnt was the same as in a similar piece which had not been burnsd. The burning, howsver, was of ths steel itself, which contained a lsrge amonnt nf oxide of iron, that is, the metal instead of the carbon burned. The heat does net harm steel or iron, and tbey may he hoated and cooled an unlimited number of times, provided they are not allowed to come in contact with the air, and so take up oxygsn. In heating a piece of eteel, the amount of blast has much more to do with the burning than the heat. If tho extra amount of oxygen which a burnt piece of steel has taken up is taken out of it, it can be mede to work just as well as it did before. Tho proof that the heat does not harm steel is fonnd in the fact that if steel is put in a closed box, and luted up so as to keep out the air, it can be heated and cooled an unlimited nnmber of times without injury."

Tarring ropes, it has been shown, slightly diminishes thsir tenacity against a pulling strain—but maintains a high average of tenacity much longer than an untarred one, by reason of the protection the tar affords against atmoepheric and other causes of deterioration. The quantity of tar found most euitable is about 15% of tbe weight of the ropo.

SCIENTIFIC PROGRESS.

The Latest Investigations in Regard to the Sun.

The great csntral orb of our system hae of late been made the subject of much epecial study. Investigations with improved apparatns and hy improvsd mcthods have been especially directed to probleme relating to its distance and mass, its temperature and constitution, and ths nature of its appendages of chromosphere and corona. Prof. C. A. Young, the distinguished American astronomer, gives an account of the most important of these invcstigations, from which we summarize as follows:—

The recent correction of the value of the solar parallex, deduced from the late transit of Venus, is a matter of much importance. Euck's figures which place the sun at 95,000,000 miles from tbs earth, have remained unquestioned for about forty years, or until ths late observations were worked out, reducing the mean distance to 93,100,000 miles.

Tho investigations next in intercst are those which deal with the solar temperaturs, concerning which the most diverse opinions existed until lately among men of science, as may he inferred from tbe etatement that scientists differ in opinion all the way from millions to the comparatively low temperature of 3,632 F. The most generally received figures are thoee of Prof. Rosetti, of Padua, who, after a series of careful and interesting investigations, places the sun's temperature at about 18,000 F.

Passing to the subject of the constitution of the eun, the eminent American astronomer, Prof. Young, alludes to Dr. Henry Draper's recent discovery of oxygen in the solar atmosphere as being the first discovery of the sxistence of a non-metallic element there. He looked forward to such improvements of photographic methods, in the near futnrs, as would lead to the discovery of other non-metallic elements in the solar atmosphere, tbe absence (non-discovery?) of which has been quite puzzling to astronomers. To Prof. Lockyer's hypothesis of the composite nature of the non-metallic elemcuts, and his infersnce that they could not exist undecomposed in the intsnse heat of the sun, Prof. Young made casual references, but did not commit himself as a believer. He referred to ths eclipse observations in 1878 as having establishcd the fact that an intimats connection exists between the state of the sun's surface and ths condition of the corona; while on the interesting question of a connection between the snn-spots and terrestrial meteorology he appears to be undecided, save that he regards as established a connection hetween the sun-spot period and the magnetic etate of the earth.

Electro-Horticulture.—In confirmation of the recent experimente in electro-horticulture by Dr. C. W. Seimens, which were noticed at length in the Press of April 17th, the *Scientific American* remarks as follows: "It has often been remarked by Arctic explorers that plants which require several months to ripen their fruit in temperate climates, complete the same round of budding, blooming and maturing in a few weeks under the continuous sunshine of the Arctic summer. A corresponding rapidity of growth is shown by annuals in sub-Arctic latitudes, as in northern Norway, where the summer suu, though never reaching a high altitude, yet remaine above the horizon from 16 to 20 hours a day. A species of corn which flourishes in Canada failed to ripen in Kentucky, though the warm season there is some weeks longer than in Canada. The euperior rapidity with which vegetation pushes forward during periods of full moon and light nights has also been widely noticed; these facts of general observation, with others of a more experimental character, going to show that many of the plants of our temperate climate thrive in proportion to the duration of the daily (direct or indirect) sunshine they enjoy, rather than according to the temperature of the air."

Science not Atheistic.

"I hsve refsrred to Cudworth's discussion of thsories of matter witb regard to the possible atheistic tsndsncies of soms of thsm; and the time has not gone by, psrhaps it never will, when the fear nf atheism, as growing out of physical theories, will have ceased to exist. I am by no means prepared to say that there is no ground for such fsar; hut I think that some portion at least of the danger of science boing found to have atheistic tendencies would be got rid of, if a clearer view could he obtained of the manner in which it is possible to estahlish a connection between physical theories and atheistic conclusions. It sesms to me that we want a new word to express the fact that all physical science, properly so called, is compslled by its very nature to take no account of the being of God: ae eoon as it does tbis, it trenches upon theology, and ceases to he physical science. If I might coin a word, I should say that sciencs was *atheous*, and therefore could not be *atheistic;* that is to eay, its investigations and reasonings are by agreement conversant simply with ohsserved facts and conclusions drawn from them, and in thie sense it is *atheous*, or without recognition of God. And, because it is eo, it does not in any way trsnch upon *theism* or *theology*, and cannot be *atheistic*, or in the condition of denying the being of God. Take tbe case of physical astronomy. To the mathematician the mechanice of the heavens are in no way different from tbe mechanics of a clock. It is true that the clock mnst have had a maker; but the mathematician, who investigatee any problem connected with its mochanism, has nothing to do with him as euch. The spring, the wheels, the escapement, and the rest of the works are all in their proper places somehow, and it mattere nothing to the mathematician how they came there. As a mathematician the investigator of clock-motion takee no account of the existence of clockmakers; but he does not *deny* their existence; he has no hostile feeling toward them; he may be on the very best of tsrms with many of them; it may be at the request of one of them who has invented some nsw movement that he has undertaken his investigations. Precisely in the same way the man who investigates the mechanice of the heavens finds a complicated eyetem of motion, a numbsr of bodies mutually attracting each othsr and moving according to certain assumed laws. In working out the results of his assumed laws, the mathematician hae no reason to consider how the bodies came to hc as they are; that they are as they are is not only enough for him, but it would be utterly beyond his province to inquire how they came so to be. Thsrefore, *so far as his investigations are concerned*, there is no God; or, to use the word above suggested, his investigations are *atheous*. But they are not *atheistic;* and he may carry on his work, not merely without fearing the Psalmist's condemnation of the fool, but with the full psrsuasion that the results of his labers will tend to tho honor and glory of God."—*The Lord Bishop of Carlisle.*

Bonsilate is the name given to a new prednct, intended as a suhstitute for ivory, bard ruhbsr and other kindrsd substances, in the manufacture of a variety of articles, such as csnee and umbrella handles, checkers and dominos, clock cases, and other ornamental objects. It is said to be harder than celluloid, and to be susceptible of being molded in dies, liks other plastic materials. It can be formed into bars, etc., and can bs turned, polished or eawed into any shape, similar to ivory. By the propsr admixture of coloring matters, malachite, costly marbles, etc., can he imitated with it, as is the case with celluloid. It is said to be made from finely-ground bones, agglutinatsd with some cementing substance, which, from tbs name adapted for the product, we suspect may be silicate of eeda. The details of the manufacture are, as yet, kept secret.

A Safety Lamp upon a New Principle.—Herr Koerner, a etudent at the Freiberg School of Mines, proposes to prevent colliery explosions by the use of a lamp which embodies an intsresting novelty. Its action is based upon the property of platinnm hlack, of condensing on its surface not only oxygen, but also light carhureted hydrogen. In a wire gauze chamber are placed pieces of pumice-etone impregnated with platinum black; and as all the air for maintaining the co mhustion passes through the chamher, all the fire-damp ie destroyed before it reaches the open flame.

The Highest Velocity of Wind.—Observere do not agree as to the highest recorded velocity of the wind, and, indeed, it is difficult to ohtain an exact measurement. It is said that 110 miles an hour has been recorded as tbe velecity of the wind blowing in a straight line, while a cyclone, or wind with a rotary motion, obtaine a much greater velocity—say abont 180 milee an hour.

Absence of Sunlight.—Dr. Carpenter saye that entire absence of sunlight on the deep-sea bottom seems to have the same effect as the darkness of caves, in reducing to a rudimentary condition the eyes of such of their inhabitants, as fish and crustacea, which ordinarily enjoy visual power; and many of these are provided with enormously long and delicate feelere or haire, with which they feel their way abont, juet as a blind man does with his etick.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 15.		Week Ending Apr. 22.		Week Ending Apr. 29.		Week Ending May 6.	
Alpha	7	6	7	6¾	7	6¼	6¾	6
Alta	2.90	2.40	3.30	2.85	3	2	2.35	1.95
Andes	1¼	95c	1.30	95c	1	75c	95c	80c
Alps	....	....	....	....	....	....	....	....
Argenta	55c	50c	55c	45c	50c	35c	35c	20c
Atlantic	....	....	10c	....	....	....	10c	....
Aurora Tunnel	45c	....	....	....	....	....	....	....
Baltimora Con	....	....	....	....	....	....	....	....
Belcher	2.95	2.15	3	2.40	2.60	1.45	2.55	1.70
Belmont	40c	35c	40c	30c	55c	40c	35c	....
Best & Belcher	12¾	8¼	12¾	10¾	11	9¼	9¾	8
Bullion	3.40	2.30	3.35	2.80	3¾	2¾	3¼	3.05
Bechtel	1.80	1.60	1¼	....	1.60	1¼	1.60	1¼
Belle Isle	75c	60c	65c	50c	50c	....	60c	60c
Bodie	9	7¼	8¼	8¼	8¼	7¾	8	7¼
Benton	2	1.65	2¼	1.80	1.80	1.50	1.45	1.05
Bulwer	6¾	5¾	6¼	6¼	6¼	5¾	5¾	5
Bogie	....	....	....	....	....	....	....	....
Black Hawk	75c	65c	1	70c	90c	75c	80c	70c
Belvidere	3¼	2.60	3¼	3.05	3.30	2¾	2¾	2¼
Booker	50c	45c	50c	45c	40c	30c	50c	35c
Catedonia	90c	60c	95c	85c	85c	50c	70c	30c
California	2.20	2¼	2.10	2.60	2.80	2.45	2¾	2.10
Challenge	1.70	1¼	1.85	1.65	1.85	1¼	1.60	1¼
Chollar	5¾	4.60	5	4¾	4.80	3.90	4.35	3.95
Confidence	6¼	4¾	6¼	6¼	6¼	5¾	6	5¼
Con Imperial	50c	35c	45c	40c	40c	30c	40c	30c
Con Virginia	3¼	2.55	3¼	3.20	3¼	2.80	3.45	3
Crown Point	2¼	1¾	2¼	1.95	2.10	1.70	2	1.70
Con Washoe	....	....	....	....	....	....	....	....
Champion	1	85c	1.10	90c	90c	70c	95c	80c
Concordia	1.10	1	1.20	1.05	1	60c	1	90c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Dancy	....	....	....	....	....	....	....	....
Day	1.15	75c	95c	85c	90c	55c	60c	55c
Eureka Con	19	18	19¼	18¾	20	19¾	20	19¼
Exchequer	2.80	2.15	2.70	2.40	2.65	2.05	2.55	2
Endowment	30c	....	30c	25c	30c	25c	25c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	95c	70c	95c	75c	85c	60c	70c	60c
Gila	20c	....	....	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodshaw	35c	30c	35c	30c	30c	25c	55c	20c
Gould & Curry	6¼	4	5¾	6¼	5¾	3¾	4¾	3.80
Hale & Norcross	5¾	4.60	5¾	5	4.95	3¾	4.35	3.30
Hillside	75c	60c	30c	25c	35c	....	36c	25c
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	45c	30c	50c	30c
Julia	1.35	1.05	1.35	1.10	1.20	75c	1	75c
Justice	1¼	1.15	2.05	1¼	1.65	1	1¼	1
Jackson	3	....	4	3	4	3¼	3¼	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	3¼	....	4	....	....	....	....	....
Kentuck	....	....	3	2.90	2½	2	2.60	2¼
Kossuth	....	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	....	....	20c	....	....	....	....	....
Lady Wash	60c	55c	70c	55c	60c	40c	45c	35c
Leopard	....	....	5c	....	....	....	5c	....
Leviathan	30c	25c	35c	20c	35c	30c	30c	25c
Leeds	30c	25c	25c	....	....	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	15c	....	25c	15c	25c	....	25c	20c
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	1	....	....	....	....	....
Martin White	50c	40c	35c	25c	90c	80c	85c	....
McClinton	70c	55c	60c	50c	60c	50c	45c	35c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	10¾	9¾	10¾	10	10¾	6¾	8¼	6¾
Mildes	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	25c	15c	25c	20c	20c	15c	15c	10c
Northern Belle	17¾	16	15¾	13	14¾	11¼	11	8¼
New Coso	....	....	....	....	....	....	....	....
Navajo	40c	30c	40c	25c	35c	25c	45c	25c
Occidental	2.60	1.30	2.05	1¼	1.60	1	1¼	1.10
Ophir	11	9¾	10¾	10¼	10¾	6¾	8¾	6¾
Oriental	50c	....	....	....	....	....	....	....
Overman	1.65	1¼	1.55	1.40	1½	35c	1.20	80c
Panther	....	....	....	....	....	....	....	....
Phenix	2	....	....	....	....	....	....	....
Phil Sheridan	....	....	....	....	15c	....	10c	15c
Potosi	3¾	2¾	3.70	3.60	3.60	2¾	3.40	2.95
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	35c	25c	30c	25c	25c	5c	20c	5o
Richer	....	....	....	....	....	....	10c	....
Rook Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	4.35	3.55	4¾	3.95	3.95	2¾	3.60	2.45
Seg Belcher	....	....	....	....	....	....	7¾	....
Sierra Nevada	16¾	14¾	16	15	16¾	9¾	11¾	9¾
Silver Hill	65c	55c	75c	60c	65c	40c	45c	25c
Silver King	5	4¾	5	4¾	5	4.90	5	4¾
Silver Prize	....	....	....	....	....	....	....	....
Sucoor	....	....	....	....	....	....	....	....
Summit	1.15	1	1.10	1	1.10	1	1.10	1
Scorpion	2.60	2¼	2¾	2.15	2¾	1.10	1¼	1.10
Solid Silver	15c	....	10c	....	....	....	....	....
South Bodie	35c	....	30c	....	....	....	25c	20c
South Standard	10c	....	....	....	....	....	....	....
Star	25c	....	25c	....	30c	25c	30c	25c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1¼	1.40	1.40	1.20	1.30	1.20	1¼	....
Tioga Con	2.05	2	2	1.90	2.10	2	2.05	1.60
Tiptop	5	....	6	5	7¼	6¾	5¾	5
Trojan	....	....	....	....	10c	....	....	....
Union Con	23¾	25	26	24¼	26	18	21	17¾
Utah	11	8¾	12¾	9¾	10	6¾	8	6¾
Vermont Con	....	....	....	....	....	....	....	....
Ward	2¾	1.65	2¾	2	2.10	1¼	1.65	1¼
Wells-Fargo	....	....	....	....	....	....	....	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	7¼	6¾	7¼	7¼	7¼	5¾	6	5¾

Sales at S. F. Stock Exchange.

Friday A. M., Apr. 30.

100 Alpha ..... 6@6¾
400 Alta ..... 2.10@2.05
905 Andes ..... .85@80c
630 Benton ..... 1.10@1.05
385 Bullion ..... 3¼@3.30
765 Belcher ..... 1.70@1.85
365 Best & Belcher ..... 8@8¼
45 California 2.35
525 Con Virginia 3
155 Chollar ..... 4@4.20
20 Confidence 5¾
180 C Dorado 1.75
2650 Challenge ..... 1@1.60
230 Crown Point ..... 1.70@1.80
225 Con Imperial ..... .30@35c
210 Caledonia ..... .60c
100 Essex 1¼
60 Exchequer ..... 2@2.20
270 Gould & Curry ..... 3.85@2.95
110 Hale & Nor ..... 3.70@3¾
250 Julia ..... .90c
315 Justice 1.05
135 Kentuck 2¾
100 Leviathan ..... .30c
160 Lady Wash ..... .40@35c
490 Mexican 7
200 New York ..... .15c
200 N Bonanza ..... .35c
150 Occidental ..... 1.15@1.10
60 Overman 1.05
80 Potosi ..... 3.05@3.10
470 Savage ..... 2¾@2.45
260 Silver Hill ..... .35c
740 Sierra Nevada ..... 9¼@10
290 Scorpion ..... 1.15@1.10
335 Union Con ..... 19@17¾
190 Utah 7
300 Ward ..... 1¼@1.60
380 Yellow Jacket ..... 5¼@5¾

AFTERNOON SESSION.

130 Alhion ..... .50@55c
600 Addenda 1
400 Argenta ..... .25c
400 Belmont ..... .35c
1250 Boston ..... .90c@1

325 Black Hawk ..... .75@70c
1600 Belle Isle ..... .55c
60 Bulwer 5¼
10 Bodie ..... .50
10 Bechtel ..... 1.60@1¾
700 Booker ..... .35c
1160 Belvidere ..... 2¼@2.60
100 Champion ..... .85@95c
50 C Pacific 3¼
100 Caledonia (B H) 2¼
200 Day ..... .60c
300 D Standard ..... .50@45c
400 Dudley ..... .30@25c
70 Eureka Con ..... 19¼@20
100 Grand Prize ..... .65c
1450 Goodshaw ..... .25c
140 Holmes ..... .20c@25c
20 Independence ..... .50c
330 Jupiter ..... 1.55@1¾
100 K K Con 4¼
100 Leopard 5c
45 Mono 5c
100 May Belle 4¼
100 McClinton 40c
100 Mt Diablo 1.20
850 N Belle Is ..... .25c
150 Navajo ..... .35c
50 Noonday 4¼
100 N Noonday 6¼
100 Oro 4¼
50 Real Del Monte 1¼
200 Ray'd & Ely ..... .10c
650 S Bulwer ..... .85@90c
10 Silver King 5
1175 Summit 1.10
60 Syndicate 1¼
130 Tioga Con 1.12
200 Tiptop 5

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Apr. 29.

20 Alpha 6¾
420 Andes ..... .85@80c
345 Alta ..... 2.05@2
415 Best & Belcher 8¼
830 Belcher ..... 1.70@1.45
273 Benton 1.20
500 Bullion ..... 3.30@3¾
190 Chollar ..... 4.30@4¼
110 California ..... 2.45@2¼

620 Tiptop ..... 5¼@5¾
150 University ..... .25c
100 Wales 3

Saturday A. M., May 1.

20 Anna 6¾
496 Alta ..... 2.35@2.20
300 Andes ..... .95c
750 Alhion ..... .55c@50c
600 Addenda ..... .95c@90c
500 Argenta ..... .25c
290 Benton ..... 1.10@1.20
100 Best & Belcher ..... 9¼@9¾
175 Bullion ..... 3¼@3.45
680 Belcher ..... 1.80@1¾
40 Bodie 8
50 Boston 1
100 Booker ..... .35c
1070 California ..... 2.35@2¼
320 Crown Point ..... 1.90@2
450 Con Virginia ..... 3.45@3.40
320 Con Imperial ..... .40@35c
50 Chollar 4.35
250 Caledonia ..... .70c
300 Challenge ..... 1¼@1.60
200 Champion ..... .95c
150 Concordia ..... .90c
50 Confidence 6
310 Day ..... .60@55c
100 Dudley ..... .40c
300 D Standard ..... .50c
200 Defiance ..... .25c
100 Exchequer ..... 2.55@2¼
55 Essex 1.60
50 Eureka Con 19¾
100 Endowment ..... .25c
80 Gould & Curry 4¼
100 Golden Gate ..... .15c
800 Goodshaw ..... .20@25c
770 Grand Prize ..... .70@65c
190 H & Norcross ..... 4.35@4¼
100 Hillside ..... .35c
235 Julia ..... .95c@1
50 Justice 1¼
100 Jupiter ..... 1.90@2
10 K K Con 4¼
100 Mackay 5c
745 Mexican ..... 8¼@8¾
180 Mt Diablo ..... .16@14¾
160 Mono ..... .60c
100 May Belle ..... .20c
300 McClinton ..... .70@65c
80 Mammoth 1.80
70 Martin White ..... .85c
1645 N Noonday 6¼
70 Noonday ..... 4¼@4.20
450 New York ..... .20c
100 N Bonanza ..... .30@35c
295 Northern Belle ..... .8¾@10
150 Occidental ..... 1.20@1¼
325 Overman ..... 1.20@1.15
185 Ophir ..... .8¼@8¾
100 Oro 4¼
75 Potosi ..... 3.40@3.30
100 Phenix 2
50 Queen Bee ..... .30c
60 Real del Monte 1¼
170 Raymond & Ely ..... .20@15c
100 Red Cloud ..... .60c
200 Richer ..... .10c
480 Silver Hill ..... .40c
660 Savage ..... 2.90@2¾
680 Sierra Nevada ..... 11¾@11¼
275 Scorpion 1¾
130 Syndicate ..... 1.15@1¼
100 S Bodie ..... .25c
400 Star ..... .25@30c
300 S Bulwer ..... .40c
100 Summit 1.05
100 Tioga Con 1.05
100 Tiptop 6¼
485 Unlon Con ..... .20@21
50 Utah ..... 7¼@8
350 Uniiversity ..... .30@25c
100 Ward 1.65
310 Yellow Jacket 5

Monday A. M., May 3.

600 Atlantic ..... .10c
222 Andes ..... .85c
200 Alta 2
70 Alpha 6¾
475 Belcher ..... 2.40@2¼
320 Benton 1.40
170 Bulliou ..... 3.10@3.20
340 Best & Belcher ..... 8¼@8¾
495 California ..... 2.40@2.45
875 Con Virginia ..... 3@3.20
140 Challenge 1.60
160 Con Dorado ..... 1.10@1.15
620 Challenge ..... 1.65@1.60
270 Con Imperial ..... .35c
20 Confidence 5¾
400 Crown Point ..... 1.70@1¾
300 Essex 1.70
5 Exchequar 2¼
200 Flowery ..... .10c
160 Gould & Curry ..... 4@3.95
70 Hale & Nor ..... 3.40@3¾
210 Julia ..... .80c
195 Justice ..... 1@1.05
200 Leviathan ..... .25c
170 Lady Wash ..... .40c
455 Mexican ..... 7@6¾
1050 New York ..... .10@15c
600 N Bonanza ..... .35c
109 Overman 1.10
120 Occidental ..... 1.15@1.10
220 Ophir ..... 7¼@7¾
150 Potosi 3
340 Savage ..... 2.45@2.40
930 Silver Hill ..... .35c
500 Scorpion ..... 1.20@1.30
10 Seg Belcher 7¾
710 Sierra Nevada ..... 10¼@10½
130 Utah ..... 6¼@6¾
200 Union Con ..... 18¾@18
470 Yellow Jacket ..... 5¼@5½

AFTERNOON SESSION.

1350 Argenta ..... .25@35c
550 Alhion ..... .50@45c
100 Boston ..... .90c
25 Belvidere 2¼
200 Black Hawk ..... .75@80c
600 Booker ..... .40c
30 Bulwer 5¼
60 Bodie 5
445 Bechtel ..... 1.60@1¼
150 Belle Isle ..... .60c
350 Concordia ..... .90c
100 Champion ..... .85c
170 C Pacific 3¼
100 Caledonia (BH) 2¼
200 Day ..... .60c
300 D Standard ..... .50c
400 Dudley ..... .30@25c
70 Eureka Con ..... 19¼@20
100 Grand Prize ..... .65c
1450 Goodshaw ..... .25c
140 Holmes ..... .20c@25c
20 Independence ..... .50c
330 Jupiter ..... 1.55@1¾
100 K K Con 4¼
100 Leopard 5c
45 Mono 5c
100 May Belle 4¼
100 McClinton 40c
100 Mt Diablo 1.20
850 N Belle Is ..... .25c
150 Navajo ..... .35c
50 Noonday 4¼
100 N Noonday 6¼
100 Oro 4¼
50 Real Del Monte 1¼
200 Ray'd & Ely ..... .10c
650 S Bulwer ..... .85@90c
10 Silver King 5
1175 Summit 1.10
60 Syndicate 1¼
130 Tioga Con 1.12
200 Tiptop 5

Thursday A. M., May 6.

1760 Andes ..... .80c
500 Atlantic ..... .10c
540 Alta ..... 2.30@2.20
30 Alpha ..... 6¾@6
670 B & Belcher ..... 8¼@8
615 Belcher ..... 2.45@2.35
660 Bullion ..... 3.10@3.05
690 Benton 1.30
316 Con Virginia ..... 3.05@3

150 University ..... .25@30c
75 Wales 3

Tuesday A. M., May 4.

60 Alpha 6¾
200 Andes ..... .80c
200 Alta 2
600 Belcher ..... 2.40@2.55
120 Bullion 3¼
10 Best & Belcher 8¾
230 Benton ..... 1.45@1.40
75 Con Dorado 1.15
30 Challenge 1.60
276 Caledonia ..... .50@60c
650 Con Virginia 3.15
100 Con Imperial ..... .30c
55 Confidence 6
150 Crown Point ..... 1@1.95
10 Essex 1.60
25 Exchequer 2¼
200 Flowery ..... .10c
250 Gould & Curry ..... 4@4.05
40 H & Norcross 4
80 Julia ..... .90c
205 Justice 1.15
200 Lady Wash ..... .40c
330 Mexican ..... 7@7¾
100 Mackey ..... .10c
340 N Bonanza ..... .30c
15 New York ..... .10c
760 Ophir ..... 7@7¾
625 Overman ..... .95c@1
50 Potosi 3.05
400 Silver Hill ..... .40@35c
320 Sierra Nevada ..... .10¼@11
125 Scorpion 1.45
190 Union Con ..... 19¼@19¾
125 Utah ..... 7@7¼
255 Yellow Jacket ..... 5¼@5¾

MORNING SESSION.

260 Addenda 1
370 Albion ..... .50@40c
45 Bodie ..... 8@7¾
245 Bechtel 1
130 Bulwer 5¾
80 Belle Isle ..... .60@55c
200 Belmont ..... .30c
100 Boston ..... .80c
100 Belvidere 2¼
100 Black Hawk ..... .75c
450 Booker ..... .45@50c
200 C Pacific ..... 3@2.90
450 Concordia 1
350 Champion ..... .85@80c
800 Day ..... .60@55c
120 D Standard ..... .50@45c
210 E M Diablo ..... .50c
250 Goodshaw ..... .50c
150 Holmes ..... .35c
100 Hillside ..... .25c
30 Independence ..... .50c
160 Jupiter ..... 1.60@1.90
120 Mono ..... .5¼@5¾
100 Mt Potosi ..... .75c
80 Metallic 9c
410 Navajo ..... .45c
210 Northern Belle ..... .10¼@10¾
100 Noonday 4¼
150 N Noonday 6¼
100 N Belle Is ..... .25c
210 Oro ..... 4¼@4¾
125 Paradise ..... .50c
100 Phenix 2
50 Real del Monte 1¼
80 Raymond & E 5c
400 Red Cloud ..... .30c
285 S Bulwer ..... .95c@1
200 S Bodie ..... .20c
250 Syndicate ..... 1@1.05
350 Summit 1.10
150 Silver King 6
250 Tioga 1¼
100 Tiptop 5¾
200 University ..... .30c
270 Wales 3

Wed'sday A. M., May 5.

640 Andes ..... .85@80c
125 Alta 1.95
30 Alpha 6¾
390 Belcher ..... 2.40@2.45
550 Benton 1.40
275 Bullion ..... 3¼@3.30
300 Best & Belcher ..... 8¾@8¼
200 Bechtel 2.40
140 Chollar ..... 4.15@4.20
120 Crown Point ..... 1¾@1.80
70 Challenge 1¼
240 Caledonia ..... .50@40c
200 Con Imperial ..... .30c
30 Con Virginia 3.10
140 Sierra Nevada ..... .10¼
260 Utah ..... 7¼@6¾
1400 Yellow Jacket 5¼

AFTERNOON SESSION.

300 Addenda ..... .95c@1
200 Argenta ..... .25@20c
1450 Albion ..... .35@40c
110 Belvidere ..... 2¼@2.55
115 Bulwer ..... 5¼@6
100 Bodie 7¾
20 Bechtel 1¼
220 Champion ..... .85@80c
100 Concordia ..... .95c
250 C Pacific ..... 3@2¾
100 Day ..... .55c
100 D Standard ..... .50c
300 Dudley ..... .30c
250 E M Diablo ..... .50@65c
20 Eureka Con ..... .20c
300 E Noonday ..... .45c
1900 Goodshaw ..... .50@55c
50 Grand Prize ..... .60c
135 Hillside ..... .30c
100 Holmes ..... .45c
200 Independence ..... .30c
100 Jupiter ..... 2@1.90
60 M Diablo ..... .14
30 Mono ..... .5¼@5½
200 Metallic ..... .80c
250 Martin White ..... .85c
230 Mammoth ..... .11
330 McClinton ..... .40c
330 Noonday 4¾
200 Northern Belle ..... .9¼@9¾
200 Navajo ..... .25c
250 Oro ..... 4¼@4.15
400 Queen Bee ..... .30c
100 Real del Monte 1¼
430 Raymond & E 5c
1200 Star ..... .25c
200 S Bulwer 1
225 Summit ..... 1.05@1.10
100 Syndicate 1.20
600 S Bodie ..... .25c
165 Tioga 1.60
260 University ..... .25@30c
100 Wales 3.05

600 Con Virginia ..... 2.95@2.90
150 Crown Point 1.90
500 Con Imperial ..... .30@35c
10 Confidence 5¾
65 Challenge 1¼
150 Caledonia ..... .55c
350 C Dorado 1.10
200 Exchequer ..... 2.05@2.10
100 Essex 1¼
150 Flowery ..... .10c
455 Gonld & Curry ..... 3.85@3.80
150 Golden Gate ..... .15c
165 Hale & Nor ..... 3.80@3.90
375 Julia ..... .80@85c
200 Justice ..... 1.10@1
80 Kentuck ..... 2¼@2
195 Lady Wash ..... .45@40c
595 Mexican ..... 7@6¾
50 Mackey ..... .10c
100 New York ..... .15c
200 N Bonanza ..... .35c
690 Ophir ..... 7¼@7¾
495 Occidental ..... 1.15@1.10
200 Overman ..... 1.05@1
150 Potosi ..... 3.10@3
100 Phil Sheridan ..... .10c
105 Savage 2¾
875 Sierra Nevada ..... .9¼@9¾
345 Scorpion ..... 1¼@1.10
1000 Silver Hill ..... .35@35c
200 Union Con ..... 18¾@18¼
195 Utah ..... 6¾@6¾
165 Ward 1¼
335 Yellow Jacket ..... 5¼@5¾

AFTERNOON SESSION.

470 Argenta ..... .15c
350 Alhion ..... .50c@55c
320 Addenda ..... .95c
130 Bodie ..... 7¼@7¾
100 Bechtel 1.30
100 Boston ..... .90c
160 Belvidere 2¼
100 Booker ..... .90c
310 Black Hawk ..... .55c@60c
600 Belmont ..... .35c
150 Concordia ..... .80c
200 Caledonia (B Hi) 2.65
250 Champion ..... .85c@80c
20 C Pacific 3¼
650 D Standard ..... .25c@40c
265 Day ..... .50c@55c
200 Dudley ..... .25c
100 Danowment ..... .25c
25 Eureka Con ..... .20c
5 E M Diablo ..... .65c
830 Grand Prize ..... .70c@65c
350 Goodshaw ..... .30c
100 Hillside ..... .30c
300 Jupiter 1¼
40 K K Con 4¼
100 Leopard 5c
100 Manhattan ..... .95c
100 May Belle ..... .20c
100 Metallic 1
15 McClinton ..... .50c
210 Mt Potosi ..... .90c
325 Mammoth 2
150 Mono 5¾
475 M White ..... .85c
100 N Belle Is ..... .20c
50 Navajo ..... .35c
570 Northern Belle ..... .11¼
100 Noonday ..... 4.05@4
250 N Noonday ..... 6¼@6¾
30 Oro ..... 4¼@4.15
300 Paradise ..... .40c
350 Queen Bee ..... .35@30c
425 Red Cloud ..... .60@50c
555 Raymond & Ely ..... .5c@10c
100 Star ..... .25c

975 California ..... 2.20@2.10
70 Chollar ..... 3.95@4
390 Crown Point 1¾
1820 Con Imperial ..... .30c
405 Caledonia ..... .45@40c
40 Challenge 1¼
540 Gould & Curry 4
355 Hale & Nor 3.30
290 Justice ..... 1.05@1
670 Julia ..... .90c@.75c
10 Kentuck 2.60
280 Lady Wash ..... .35c
980 Mexican ..... 6¾@6¾
1400 Mackey ..... .10c@10c
875 New York ..... .10c
1050 N Bonanza ..... .30@.35c
325 Ophir ..... 6¾@6¾
205 Overman ..... .80c
355 Potosi 3
100 Phil Sheridan ..... .15c
925 Silver Hill ..... .35@.25c
615 Scorpion 1¼
190 Savage ..... 2.35@3.30
310 Sierra Nevada ..... .10¼@10¾
185 Utah ..... .6¾@7
455 Unlon ..... .18¾@18¾
100 Ward 1.55
675 Yellow Jacket ..... 5¼@5¾

AFTERNOON SESSION.

1320 Addenda ..... .1@.30c
400 Albion ..... .30c
150 Argenta ..... .25@.20c
5 Bodie 7¼
555 Bechtel 1.50
100 Boston ..... .80c
750 Booker ..... .40c
285 Black Hawk ..... .80c
350 Belvidere 2¾
10 Belmont ..... .35c
200 Belle Isle ..... .55c
900 Champion ..... .75c@80c
420 Concordia ..... .90c@1
15 C Pacific ..... 3@2.85
150 Day ..... .65c
500 D Standard ..... .25c
65 Eureka Con ..... .19@19¼
100 E Mt Diablo ..... .55c
700 E Noonday ..... .50c
30 Grand Prize ..... .65c
250 Goodshaw ..... .55c
100 Hillside ..... .25c
250 Holmes ..... .50c
200 Jupiter 1.60
30 Jackson 3.30
5 K K Con 4¼
90 Leopard 5c
100 Manhattan 1
110 Mono ..... .5¼@5¾
600 May Belle ..... .25c@.20c
150 Mt Potosi ..... .65c@.75c
150 McClinton ..... .40c
410 Mammoth ..... 1.65c@1.60
40 Mt Diablo ..... .14
25 Metallic ..... .75c
95 Northern Belle 9¾
200 Navajo ..... .30c
75 N Belle Is ..... .25c
230 Noonday 4¾
50 N Noonday 6¾
50 Oro 4
100 Paradise ..... .35c
300 Queen Bee ..... .35c
400 Raymond & Ely ..... .35@.30c
200 Real del Monte 1.10
210 S Bulwer 1
50 Silver King 4.90
700 Star ..... .25c
750 South Bodie ..... .20c

100 Syndicate 1.10
960 Summit ..... 1.10@1
60 Syndicate 1.10
50 Tiptop ..... 5¾@6
150 Tioga Con ..... 1.55@1¾
1405 University ..... .30c
125 Wales 3.10

Pacific Board—Latest Sales.

Wed'sday A. M., May 5.

20 Alpha 6¾
100 Andes ..... 1.95@1.80
200 Alta ..... 2.45@2¼
310 Bullion ..... 3.20@3.45
50 Benton 1.40
170 Best & Belcher ..... 8¼@8¾
315 Belcher ..... 2.40@2.45
110 Crown Point ..... 1.80@1.85
60 Con Virginia 3.10
100 Crown Point 1¼
110 Con Virginia ..... 3.20@3.15
220 Caledonia ..... .60@45c
320 Exchequer ..... 2.30@2¼
620 Gould & Curry ..... 4@3.90
460 Justice 1¼
200 Lady Wash ..... .43c
230 Justice ..... 1.05@1.10
10 Mexican 7¼
300 Occidental ..... .90@85c
90 Ophir ..... 6¾@6¾
100 Overman ..... .60c
60 Savage 2¼
150 Sierra Nevada 10¾
100 Tiptop 5
270 Utah ..... .3.45@3.55
1000 Silver Hill ..... .35c
50 Union Con ..... .18¾@19
45 Utah ..... .7@7¼
240 Union Con ..... .18¾@18¾

30 Yellow Jacket 5¾

AFTERNOON SESSION.

60 Alta ..... 2.40@2.45
60 Best & Belcher ..... .8¼@8¾
100 Baker ..... .20
260 Benton 1.40
120 California 2¼
500 Con Imperial ..... .25c
60 Con Virginia 3.10
100 Crown Point 1¼
300 Champion ..... .80@85c
100 Day ..... .60c
100 D Standard ..... .50c
620 Gould & Curry 4
460 Justice 1¼
70 Hale & Nor 3¼
230 Justice ..... 1.05@1.10
10 Mexican 7¼
300 Occidental ..... .90@85c
90 Ophir ..... 6¾@6¾
100 Overman ..... .60c
60 Savage 2¼
150 Sierra Nevada 10¾
100 Tiptop 5
270 Utah ..... .3.45@3.55
1000 Silver Hill ..... .35c
50 Union Con ..... .18¾@19
45 Utah ..... .7@7¼
240 Union Con ..... .18¾@18¾
60 Yellow Jacket 5¼

California Board—Latest Sales.

Wed'sday A. M., May 5.

1300 Ætna ..... .5@7c
20 Alpha 6¾
70 Alta 2
100 Andes ..... .82½c
100 Argenta ..... .25c
50 Belcher ..... .2.45@2.47½
100 Benton 1.40
40 Bullion ..... .3@3.30
150 Caledonia ..... .50@52c
20 California 2.40
30 Chollar 4.30
10 Con Virginia 3.20
300 Con Imperial ..... .32@3cc

30 Gould & Curry ..... .4@4.05
120 Hale & Nor 3¾
120 Lady Wash ..... .44c
30 Mexican ..... .7¼@7¾
20 N Noonday 6¾
20 Ophir ..... .7¼@7¾
20 Overman 1.35
30 Savage ..... .3¼@3.55
20 Scorpion 1.30
20 Sierra Nevada ..... .10¾@10¾
100 Silver Hill ..... .35c
100 Trojan 8c
20 Utah 7
20 Union ..... .18¾@18¾

A CANOE capsized in the Skigit river, Monday of last week, resulting in the drowning of six miners. Six others, including an Indian, who were in the canoe at the time, escaped with their lives. The accident is attributable to the overloading of the canoe, which contained, besides the 12 in question, 700 pounds of freight. Following are the names of the men who perished: David Ball, Skagit; Arthur I. Dempsey, Quincy, Cal.; William Murry, Seattle; William H. Goucher, Oregon; James Scanlin, Quincy, Cal.; Captain Stephen Henry, Seattle.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	3	20	Mar 25	Apr 30	May 21	T H Dixon	328 Montgomery st
Alta S M Co	Nevada	17	50	Apr 5	May 10	May 31	W H Watson	302 Montgomery st
Argenta M Co	Nevada	5	25	Apr 28	June 2	June 22	E M Hall	327 Pine st
Belcher S M Co	Nevada	22	76	Apr 2	May 6	May 27	J Crockett	203 Bush st
Benton Con M Co	Nevada	3

The Mining Bill.

The proposed changes in the United States mining laws, suggested by the Public Land Commission bill, are still the subject of serious discussion. All of our cotemporaries with any interest in mining matters, have published editorials and communications, universally condemning the measure. Miners' meetings have been held, and protests signed and forwarded to Washington. It is, as previously stated in these columns, not probable that any definite action will be taken during this session of Congress, though there may be; but it is as well to keep alive the discussion, to let the members know that the miners are opposed to the suggested changes.

At a meeting of the House Committee on Mines on Tuesday last, Representative Bedford offered a short and simple substitute for the Public Land Commission bill. This substitute proposes to confine all new legislation on the subject to an amendment of Section 2,322 of the Revised Statutes by adding to said section the following words: "And in all cases where the main dip of the lode, vein or ledge does not exceed 30° from the horizon, the right to follow to the mineral shall not extend beyond the side line drawn downward vertically." Senator Jones and Representative Daggett were present when this substitute was offered. They stated that they could see no objections to its adoption, they being satisfied that a distinction should be made between flat lodes and fissure veins. Mr. Bedford suggested that the Congressional representatives of the mining States and Territories should meet at Senator Jones' house and definitely agree upon a measure regulating the location of flat lodes that do not appear upon the surface, and a meeting will be held accordingly.

As soon as the bill is agreed upon it will be introduced in the House and Senate, and pressed for passage without delay. The Public Lands Commission bill is opposed by all the members from the far West, and a number from the East, and Tuesday's proceedings in Committee indicate that, as it stands at present, it will not become a law. Senator Jones, in the course of his argument before the Committee to-day, cogently remarked that the miners are familiar with the existing law, and that all the conceivable questions growing out of it have been adjudicated. He then distinctly intimated his opinion that the pending bill had been gotten up in the interests of mining lawyers and so-called "experts," who desire new laws and new conditions in order to open up for themselves further opportunities for employment.

The Mining Share Market.

There appears to be no immediate prospect of a rise in the stock market, the depression continuing with remarkable consistency. There has been a ripple of excitement over the failure of the firm of D. Z. Yost & Co. The amount of the firm's liabilities is stated by Mr. Yost to be about $110,000. The cause of the suspension is the inability of the firm to any longer stagger under a load of bad accounts and indebtedness, many of which the firm have been carrying.

The following monthly statements have been made: Con. Virginia, cash on hand $245,274.38, and 44,873 ounces of unsold bullion; California, $48,207.83; Utah, cash on hand, $15,466.45; Best & Belcher, $569.72; Alpha, indebtedness, $19,854.63; Gould & Curry, cash on hand, $26,797.54; Occidental, $12,456.17; Hale & Norcross, $17,781.87; Alta, balance to credit, $51,926.55; Benton Con., $127,861.63; Lady Washington, indebtedness, $5,544.74; Ophir, $124,380.09; Mexican, $52,960.84; Crown Point, $17,897.94; Belcher, $33,441.66; Con. Imperial, $14,185.12; Chollar, cash on hand, $16,504.22; Potosi, $16,454.65; Silver Hill, indebtedness, $2,700.76; Union Con., cash on hand, $55,730.59; and Sierra Nevada, indebtedness, $12,542.37. Exchequer, cash on hand, $26,249.81; Bullion, cash on hand, $29,773.16, with a portion of delinquent assessment yet to collect. There is an indebtedness, however, to be paid during the year, for three-fourths of the Ward shaft, of $300,000. Julia has $14,024.15 cash on hand, and company's notes out for one-fourth Ward shaft for $100,000. Justice has an indebtedness of $15,678.78, after deducting cash on hand and value of recent supplies. Northern Belle has $98,544.85 after paying all debts up to April 30th. Standard had $136,912.95 cash on hand April 30th, over all indebtedness. Bulwer, cash over all debts, $15,908.32. Bodie had on hand April 30th, $20,822.78, from which the expenses of the mine for April are yet to be deducted, and other liabilities amounting to $1,919.85.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

PACIFIC BELL TELEPHONE CO.—May 4th. Object: To construct and operate telephone lines in the State of California and elsewhere. Capital, $100,000. Directors—George S. Ladd, Monroe Greenwood, Henry C. Hyde, Milton A. Wheaton, Clarence R. Greathouse, James Gamble and Samuel O. Hunt.

SPRING VALLEY M. CO.—May 3d. Location: Devil's Gate district, Nevada. Capital, $30,000,000. Directors—A. K. P. Harmon, Isaac L. Requa, John Skae, Thomas H. Williams and C. G. Funk.

NEWCASTLE M. CO.—May 5th. Capital, $50,000. Directors—Charles E. Allen, O. O. Burgess, E. G. Matthews, J. A. Rudkin and H. C. Kuhl.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

IDLE.—Amador *Dispatch*, May 1: The Zelle mill had to be idle for a few days at the beginning of the week, owing to a break in the pipe carrying water across Jackson creek just below town.

SUTTER CREEK.—Cor. Amador *Ledger*, May 1: The difficulty in the Lincoln with regard to the water is partially overcome. The hoisting of ore has been resumed, and the 40-stamp mill is in motion again. A strong flow of water is encountered, which requires close attention. It is now conquered, or nearly so; at any rate, the worst of the trouble is past.

CONSOLIDATED AMADOR.—The late flood in Sutter creek carried away the dam above the mill, and the free water supply for the mill has consequently been cut off, compelling the company to get all their water from the Amador canal, thereby entailing extra expense.

FRENCH CAMP.—The Olentanza shaft is down 40 ft, with a 4-ft ledge, and looks well. They have out about 150 tons of rock, which will pay $8 per ton.

AMADOR GRAVEL MINING COMPANY.—Amador *Ledger*, May 1: The partial clean-up made recently paid fairly. The sluice boxes alone were cleaned, and we are told the sum of $300 was obtained. Drifting is now in progress. A lead of blue gravel, found close to the bed rock, is being drifted upon. Its extent is yet undetermined, but the gravel prospects exceedingly well.

VOLCANO ITEMS.—A clean-up at the Downs mine, made last week, yielded at the rate of $20 per ton. They are now commencing to open a level at 450 ft. After getting the prospecting pretty well advanced, if the outlook is favorable, it is reported that Mr. Downs will put up a mill this summer. The last clean-up of the Golden Gate mine averaged about $21 per ton. The big tunnel enterprise advances at a good rate. Since J. W. Moyle took charge of the undertaking, the tunnel has advanced at the rate of 2 ft per day. It is now in over 1,500 ft, with less than 800 ft to bore through. When work is fairly started from both ends, it is expected to make 5 ft per day, as the rock at the upper end is much softer than that which they are now passing through.

MISCELLANEOUS.—Wm. Moore has received the contract to deliver 2,000 timbers to the Amador Consolidated mine at Sutter Creek. These timbers have to be hauled from the vicinity of Whitmore's mill, a distance of 20 miles from the mine. L. McLaine brought down to Jackson on Tuesday bullion of the value of $14,000, the output of Volcano district for the past month. The sulphurets from the Zelle mine are being hauled to the Carland reduction works at Sutter Creek. At last one clean-up has been made at the Zelle mine, but it is impossible to say with any degree of certainty the exact amount realized. All the prominent mines of the county keep the bullion output a secret as much as possible. We do not know the reason for this, but such is the case. The Zelle is no exception to the rule. All that we can say is that the mine is paying, but that is good enough news, anyway. The Yellow Jacket of Drytown has not yet recovered the carrying away of the water to the mill, but expects to in a few days. The North Gover has struck a body of ore, a foot wide, of a payiug grade, with hopes that it will expand into a bonanza. This will encourage the stockholders to pungle up their assessments. Sinking is about to be resumed at the Empire, of Plymouth. The south shaft is to search the earth another 100 ft, from the 1200 to a 1300 level. The mine is looking as well as ever.

BUTTE.

PUSHING WORK.—Oroville *Mercury*, April 30: The Spring Valley hydraulic gold company are hiring every applicant for employment. There is not an idle man to be found in Cherokee, and a large number of those at work hail from outside communities. Superintendent Waldeyer is evidently determined to develop the property for all it is worth. He informs us that a blast requiring 25,000 pounds of powder will be fired in a week or two.

BUTTE GRAVEL MINING CO.—Superintendent Rhodes floated the boat of the Butte gravel mining company into the pit of the old Henrietta works Wednesday. Flumes are in process of construction, and the patent pumps will be working the dirt of the banks Monday or Tuesday.

CALAVERAS.

MINING ACTIVITY.—Calaveras *Chronicle*, May 1: The ditch has recovered from the injuries it received during the storms and is now whole and sound. There is an abundance of water, and as a consequence of all these good things, great activity is observable in mining operations. All the hydraulics and tunnel claims are in full and successful blast, and the probabilities are that there will be no more interruptions this season.

MINE FLOODED.—During the recent storm the Wallace & Ferguson mine, at Sheep Ranch, was flooded, the water rising about 120 ft in the shaft. The 300 and 400 levels are both under water, or have been. At last accounts the water was being lowered slowly.

RICH STRIKE IN THE CHAMPION.—We are much pleased to learn that a big body of exceedingly rich ore has lately been uncovered in the 400 south level of the Champion mine at West Point. The ledge shows fully 18 inches wide and the rock assays over $100 per ton. The Champion stands very near the head of first-class mines.

MITCHELL MINE.—Developments still continue with the good weather. Messrs. Bastian & Jones are opening up the old Mitchell mine again. A tunnel is being run a distance of 750 ft to tap the lode 130 ft deep. Seeing that the claim has always held up its own reputation, we may expect good results for the present owners.

ANNA MINE.—Messrs. Stager & Breeze, of this town, and Judge Leavitt, of Mokelumne Hill, are about to open one of the richest mines known to exist in West Point district. It is and has been known as the Anna mine, situated on the extension of the Lone Star and Woodhouse mines. The mine was worked in the days of 1852, the rock taken out averaging $1,000 per ton. The lode runs due north and south with a pitch of 13° to the west. The owners have met and agreed to commence operations on their bonanza, so look out for the future.

MINING at Vallecito is at present on a standstill, on account of too much water.

THE Bonanza mine, near Copperopolis, has stopped work for the present. It is reported that the company intend putting up larger works for crushing the ore.

NEW LEAD.—Angels *Echo*, May 2: A quartz lead has recently been discovered on Bear mountain, near Croset's ranch, which is about 20 ft in width. In the center of this huge vein is about 4 ft of quartz, which differs in color from the main vein on either side. Several assays have been made from this rock, one lot of which assayed $7 in gold and $13 in silver.

A MEXICAN, living near Albany flat, recently found a beautiful quartz specimen weighing a fraction over $10. Albany flat is famous for coarse gold diggings, and many fine specimens have been found in that section.

STOPPED WORK.—Calaveras *Citizen*, May 1: Work in Haggin & Co.'s mine, at Sheep Ranch, has been suspended for the past week or two, owing to the lack of a sufficient quantity of wood to keep the mill running. During the recent storm the mine became partly filled with water, and the pump has been kept constantly going to lower it. Work will probably be resumed the first of the week.

EL DORADO.

MINING ENTERPRISE.—*Mountain Democrat*, May 1: Last Saturday we paid a visit of inspection to the mining operations of the Hulburd Brothers—Byron and Hiland—at Little Spanish hill, a short distance south of Upper Placerville. Taking advantage of the enforced idleness of their fruit canning and drying business, these energetic young men commenced prospecting a gulch or swale that heads in Little Spanish hill, crosses the lower end of their orchard and empties into Cedar ravine. Their success here exceeded their most sanguine expectations. Mixed with their gulch gold they occasionally found specimens of gold-bearing quartz, one of which was quite large and exceedingly rich. This induced them to explore for a quartz ledge in the adjacent hill. Here again, they have been rewarded with what promises to be a most gratifying and profitable success. At the head of the gulch, after stripping off a few ft of slate, they discovered a quartz seam a few inches thick that yielded a flattering prospect. Following this about 100 ft up the hill, the rock continued to improve in quality, and they sank a shaft to a depth of about 40 ft, when, owing to the excessive wetness of the season, they were driven out by water; not, however, until the ledge had increased to 3 or 4 ft in thickness, all prospecting handsomely and developing well-defined foot and hanging walls, and a 4- to 6-inch gouge. They then went down to the foot of the hill, where they have put up a modest but substantial and well arranged little 2-stamp prospecting mill, to be run by a hurdy-gurdy of 6 ft 2 inches in diameter, with a water pressure of 175 ft. In prospecting the ledge, building the mill, laying the pipe and setting up the hurdy-gurdy, they have, though perfect novices in such work, performed all the labor themselves, and have done it well. So that, at a comparatively trifling outlay in money, and in utilizing time that would otherwise have been wasted, these enterprising young men are in a position to prove what the ledge is worth.

MONO.

MAMMOTH.—Mammoth City *Herald*, April 28: During the week past no work has been done in tunnel No. 3. In No. 4 a distance of 48 ft has been run, following in on the footwall, with the same formation of clay and slate gangue lying between the footwall and the ledge, which works so easily that the use of the Burleigh drills has been dispensed with. Considerable water is still flowing, but does not interfere with the workings, being easily carried off by the sub-drain. The total length is now 1,301 ft.

H. L. & M. C. JOINT TUNNEL.—Master Mechanic Colby arrived from Bodie on Monday morning with the new piston and other machinery necessary for the repairs to the engine of the air-compressor, which were immediately put in place and the machinery started. The new parts of the engine were manufactured at the Bodie foundry under the personal supervision of Mr. Colby, and reflects great credit on that establishment, everything fitting to a nicety.

SEVERAL parties have started out prospecting towards the southern portion of the county, and others are making preparations to start as soon as the grass is sufficient for animals to live.

COOP reports come from the mines in South End. The ledges in that portion of this district are showing up very well, taking into consideration the small amount of work which has been done on them.

OTHER attachments have issued against the True Blue mining company's property.

WORK was recommenced yesterday at the M. C. & H. L. tunnel. The usual force of miners have been put at work.

LAUREL DISTRICT.—Jack Casey has come in from this promising mining locality, situated about 7 miles south of Mammoth and immediately adjoining Lake district. Mr. Casey is highly elated over the rich discoveries of ore in the IXL mine, of which he and Mr. McLain are the owners. The ledge is represented as being large, and, from the samples left at the *Herald* office, is very rich in gold and silver. There are many other large and rich ledges in this district, and a large amount of work will be done during the coming summer, and we may look for some very rich and important developments. The ores differ somewhat from those of Lake, in that they are in a lime formation and baser in character, and will have to be roasted before milling. There are good reasons for believing that a mill will be built during the summer. The facilities are good, wood, water and building materials are bountiful, and the district easy of access.

SIERRA.

FOREST QUEEN.—*Mountain Messenger*, May 1: Work is to be commenced immediately on the Forest Queen quartz mine, near Downieville.

CAVE.—There was quite an extensive cave in the North Fork diggings at Forest City, last week. No one was injured, but considerable work was necessary to repair the damage.

MONTE CRISTO.—Our mines are doing but little at present, owing to the severe storm, but expect to boom shortly. The Mountain Lava, formerly the Empire, has suspended operations indefinitely. The storm which commenced nearly two weeks ago has been the roughest of the season. Snow is scattered about all the way from 5 to 40 ft deep; a fair average, however, is believed to be about 14 ft.

SISKIYOU.

THE MINES.—Yreka *Journal*, April 28: The men engaged in cleaning out and improving the Big ditch above Cottonwood gulch are now above Townsend's and near Surface gulch. The building survey of the ditch from Cottonwood gulch to Hawkinsville, on the east side of Yreka, has also been completed. Work is also being prosecuted in building the reservoir at Cottonwood gulch, which the water will be let into, so as to get full by the time the new ditch is ready, and by the aid of such surplus the upper ditch will furnish enough water to keep the new extension supplied. The new ditch along the east side of Yreka is to be 4 ft wide at the bottom, 6 ft at the top and 3 ft deep, with a fall of over 8 ft to the mile, and the highest elevation of any of the flumes will be about 56 ft. At Oberlin's gulch, south of Yreka, there will be a long flume, and also another at the Conover place, back of McNulty's, north of town. All the hydraulic companies in Scott valley and throughout the county are now busy piping down the gold-yielding banks, and ought to have been at work two months ago to put in their usual spring and summer season. The cold weather hanging on so late has prevented the flow of water, and though there is a great quantity of snow on the mountains, it is likely to melt off with a rush under the influence of the warm days, rather than hold out over a few weeks longer than general at most.

SHASTA.

FRENCH CULCH.—Reading *Independent*, May 1: The quartz mines are beginning to bring in their bullion in considerable "wads." The Apex mine cleaned up, after grinding between 6 and 7 tons of rock, $1,400. The Brown Bear is paying from $50 to $60 per ton, with fine prospects in free gold. The Niagara company, after a short run, cleaned up $1,000. The Centennial company have been crushing some rock to clear their platform, and upon scraping out the arastra obtained $1,000. The miners on Deadwood are also forwarding bullion.

TRINITY.

DITCH SLID OUT.—Trinity *Journal*, May 1: A portion of J. W. Smiley's ditch, which conveys water to his mine at Douglas City, slid out the first of this week. It is a very bad break and will be a big job to repair it.

FROM Jack Blackwell, Altoona mail-man, we learn that the Altoona quicksilver mine has shut down; also that there are 5 ft of new snow in Cinnabar.

MINERS all over the county are at work with a good supply of water.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Gold Hill *News*, May 5: The drift on the 2500 level is in a heavy vein formation and is still east of the water belt. In fact it was to escape the water known to be in the formation lying west of that in which the present work is carried on that the east drift on the 2400 level was pushed so far out and the winze sunk where it was. This drift will probably encounter water, however, before the connection is made, since there is a heavy flow into the Sierra Nevada incline on the 2500 level.

OPHIR.—There is still much quartz in the vein matter encountered in the east drift on the 2500 level. The new drift running north from the above east drift and 330 ft east of the incline is following the heavy formation of quartz and clay there encountered, and is designed to open it up and ascertain its value. The joint Mexican crosscut east on the 2500 level is in a singular formation of highly silicified vein porphyry, which looks well.

SIERRA NEVADA.—The north drift on the 2300 level has been pushed a distance of 750 ft from the east winze, and work at that point suspended for the present.

CALIFORNIA.—Work on the stopes, 1750 level, was resumed Monday night. Prospecting for ore east of the old stopes on the 1500 level continues.

NORTH BONANZA.—The crosscut west on the 600 level has penetrated the ledge 70 ft and cut nearly through it. The body of base ore on this level is richer than on the 400 level, but not as large.

MEXICAN.—The drift north on the 2500 level has its face 65 ft from the Ophir line, and is in a vein formation, carrying some quartz.

SILVER HILL.—The pump bob on the surface has been changed and other repairs to the pumping apparatus made and everything put in good shape.

BEST & BELCHER.—The joint Con. Virginia crosscut east, 2000 level, has been abandoned for the present, the supply of air which was derived from the Booner shaft having ceased.

BELCHER.—The work of clearing out the caved portions of the south drift, 3000 level, progresses as well as the extreme heat there will permit.

SAVAGE.—The flow of water into the drift toward the inclins on the 2400 level of the C. N. S. shaft is still too strong to admit of the resumption of work.

SUTRO TUNNEL.—The north header is being pushed along rapidly into California ground. The south lateral branch of the tunnel is once more being pushed ahead and making good progress, the header having been started again yesterday.

ANDES.—East drift on the 400 level has shown some good-looking quartz, but still of low grade.

CON. VIRGINIA.—Monday night the men were replaced in the stopes on the 1750 level, and the usual output of ore was resumed. Work was resumed in the drift to connect the C. & C. shaft with the north lateral branch of the Sutro tunnel Sunday night. On the 2300 level the joint California crosscut continues to penetrate heavy vein matter.

OPHIR.—The southeast drift on the 1650 level is still following the vein in that direction, and as it passes along it turns out some nice looking quartz, and some bunches of ore, but no regularly formed and well defined ore body has yet been encountered.

ALTA.—East crosscut, 1050 level, is in a distance of 125 ft, and no sign of an east clay has yet been found.

EUREKA DISTRICT.

GRANT MINE.—Eureka *Sentinel*: This mine is situated on the extreme south end of McCoy hill, and has been leased since the 1st of January last to Messrs. McMahon & Conway, who, after doing a large amount of dead work, in order to put the mine in proper shape, have, within the last 45 days, hoisted over 100 tons of ore, which will run from $75 to $100 per ton, and have at least double that amount in sight in the mine ready to break down.

THE ZULU.—At the bottom of the 100-ft shaft a drift is being run in a westerly direction, and about a week ago a body of ore was uncovered of a similar character to that found in the Grant. Every indication shows that the main ledge will be cut before many more feet have been run.

EUREKA TUNNEL.—The tunnel is in a distance of 1,225 ft, and before the close of many weeks the contractors expect to strike the main ledge.

SILVER CONNOR.—This mine is making rapid headway with their new shaft, and when it is completed will be able to work the mine to far greater advantage than its present condition permits. They have already a large amount of ore on the dump, which will be shipped to the reduction works as soon as the trails are open.

THE SAN JOSE.—This mine is being worked under lease by Messrs. Taylor & Shindler, and within the past month has made some very important developments. This is one of the most valuable properties on Prospect mountain, and one which will, before long, be counted as one of the leading bullion-producing mines of the district. The present lessees are extracting from 1½ to 2 tons of ore per day, which will average from $120 to $175 per ton.

ARIZONA.

SOLD.—Tucson *Record*, April 27: The Mina Verde claim, near Altar, has been sold by Chas. Isenbach, of Tucson, to San Francisco men for $10,000 cash. Mr. Isenbach left yesterday with the purchasers for Altar to turn over the property.

WASHINGTON.—Mr. W. H. Walker and Col. Thos. Morgan came in from Washington camp yesterday, and are enthusiastic over the town and mines of Washington. These gentlemen have prospected and worked in this district for two years, and have many valuable claims and mill sites. On the 23d instant native silver and copper were struck in the 50 level of the Holland mine, now owned and worked by Luttrell & Co. The W. C. Davis and Pensacola, under charge of James Finlay, are taking out ore, and ore only. Jack Hawkins and Al. Skinkle, of Colorado, are running a tunnel in the Lafayetto, and have struck a fine body of carbonate, galena and black sulphates, the latter the first ever found in camp. The Lafayette is considered one of the most promising claims here. Property in Washington now commands good price, and those who have held on are reaping their reward.

A DISTRICT, rich in mineral, is being organized 35 miles north of Camp Grant. The leads are described as cropping up 40 and 50 ft in the air, and as 20 to 60 ft in width. Some magnificent specimens of top rock, full of horn silver, were brought into Tombstone yesterday and assayed from $300 to $800.

EVERGREEN DISTRICT.—Mayor R. N. Leatherwood and C. O. Brown came in yesterday from the Evergreen district, west of Picacho and 45 miles from here. They visited the Young America copper mine, recently sold by Mr. Brown to California men, and describe it as a mountain of copper. Met Messrs. Gibson and Murphy, who were working some silver claims there and found the prospects all looking well and the hills full of prospectors.

ARIVACA DISTRICT.—Tucson *Record*, May 1: Joseph Elliot, deputy Sheriff of the village of Arivaca, arrived from the latter place yesterday. Arivaca is building up rapidly, and while there is no particular rush to the town observable, the improvements under way are of a character which betokens confidence in the permanence of the town. Both the Derre & Townsend and the Arivaca mills are in operation constantly. Mine owners in the district are at work developing their properties, and results so far are most favorable. Greater activity now prevails in this region than has ever previously been observable. The town is quiet and orderly, which Mr. Elliot considers due to the fact that most of its residents are interested in the mines, and their time is more devoted to exploring of them than in indulging in the pastimes which too often marks the history of frontier settlements.

BABOQUIVARI DISTRICT.—Tucson *Record*, May 1: We are indebted to Mr. Wm. Clark for the following items regarding this district, which is not much known, but whose ores entitle it to final rank in the list of southern Arizona's booming camps: Baboquivari district includes that section of the country surrounding the eastern base of Baboquivari peak, one of the prominent land-marks of Arizona, and lies about 20 miles west of Arivaca. But little prospecting has been done so far, but limited explorations have resulted in wonderfully rich finds. The veins discovered are large and well defined, and carry high-grade gold and silver ores. Prominent among the mines being worked is the Alta, owned by Hudson & Bent, which shows a ledge 20 ft in width. The vein has been opened up by a 20-ft shaft and 13-ft drift. Ore was found from the grass roots down worth $600 to $700 per ton, which is being sacked for shipment. The same parties are also owners of the Pittsburg, on which two shifts of miners are now working. Twenty tons of ore now on the dump will run $200 to the ton. The Black Hawk, owned by Hardwick & Clark, has a shaft 55 ft deep, and showing ore its entire width. The Cincinnati, owned by the Raney Bros., is being developed by a tunnel, now in 53 ft. A vein of high-grade ore has been discovered to a width of 10 ft. In this district wood is abundant, and water is obtained by sinking wells to a depth of not more than 45 or 50 ft.

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Distribution of Lakes in the United States.

[By Prof. John Le Conte.]

There are numerous lacustrine basins to be found in the States bordering the Pacific ocean. As in other regions of the globs, tbeir distribution ie determined by the configuratiòn of land, or, more specifically, by the forms of tbe great hydrographic basins in the interior of the continent; hencs some general idea of the topography of the Western portions of the United States ie an sseential preliminary.

Topography.

One of tbe grand topographical features of ths two American continents is the system of mountains bordering on the Pacific coest, extending from Cape Horn to the North Polar sea. This vast system of mountein chains bes been collectively designated by some geographers as the Cordillieres. Different portions of it have received special designations, as the Andes, in South America; the Sierra Madre, in Mexico; and the Rocky mountains, the Sierra Nevada end the Cescede Range, in the United States. This great mountaiu system, entering the United Statss from Mexico, rapidly widens and subdivides into a lahyrinth of mountain ranges, the whole mass having a maximum width near the parallel of 39° or 40°, of about 1,000 miles. According to Prof. J. D. Whitney, the whole area embraced within this mountainous belt is but little, if any, short of 1,000,000 of square miles. The enormous mass included within the extreme boundaries is of a somewhat lozenge-sbape, the length of each side being ahout 600 or 800 miles; "ie formed hy the Sierra Nevada and the Cascade Range on the two westerly faces, and by the Rocky mountains, with the Big Horn, Wind River and Bitter Root ranges, on the two easterly facee." Between these two gigantic mountain systems lies the

Great Interior Plateau,

Whicb constitutes the great physical feature of our territory. The plateau thus enclosed has in its central section from eest to west, in the pathway along which civilization has advanced, an elevation of 3,000 to 7,000 fset, falling off to the north and to the south; and in the latter direction sinking more than 200 feet below the sea level. Ths drainage of this vest area ie accomplished hy thres great rivers and their numsrous trihuteries, viz.: 1. The Columbia river in the north, discharging into the Pacific ocean. 2. The Rio Colorado of the west, discharging into the Gulf of California. 3. And ths Rio Grande del Norte, discharging into tbe Gulf of Mexico. That portion of tbis greet plateau which has been designated the great interior hasin is without outlet to the sea. The great plateau is traversed hy various ranges of mountains, of which the Wahsatch, extending north and south through nearly 400 miles, is the most notahle. Between the Wahsatch and the Rocky mountains runs the Uintah range, the only high and well-defined chain in ths Cordilleras haviug an east and west trend. It is likewise traversed by several subordinate ranges of considerahle magnitude, and is diversified hy innumerahle spurs and ridges, transversc narrow valleys and occasionally broad plains; the valleys being sometimes green, attractive and refreshing, while the plains are always arid, repulsive and dcsolate to the last degree.

It is evident thet this portion of our territory lying hetween the lofty snow-clad Rocky mountains on its eastern margin and the Sierra Nevada mountains on its western houndary, can reccive hut a scanty supply of moisture from the vapor-hearing winds coming from either the Atlantic ocean and the Gulf of Mexico ou ths one hand or from tbe Pacific ocean on the other. Many of ths streams are largely supplied with water from the melting of the snows, which crowu the cummits of the two great mountain houndaries. Many portions of thess arid plains only need water to rendsr them fruitful; in such cases, when irrigation is practicahle, the seeming deeert may be made to hloseom.

Great Basin.

Ths central portions of what ws have designated as the great plateau is divided into two distinct regions hy the Wabsatch range of mountains trending nortb and eouth near the eastern horders of the Grsat Salt Lake for ahout 400 miles, viz.: 1. The great platean proper lying, at an elevation of ahout 7,000 feet ahove the sea level, between the Rocky mountains on the east and the Wahsatch mountains on the west. 2. The great hasin lying, at an elevation of about 4,000 to 5,000 feet, betwesn the Wahsatch range on the east and tbe Sierra Nevada on the west. The region occupied hy the mountains hordering the great basin has no drainage into the sea; the streams that head in the mountains find their way into saline lakes, disappear in sinks, or are loet in tbe sands of the deserts, where their watere are evaporated.

The great hasin region is subdivided hy the Humholdt mountains into two suh-hasins, viz.: *a.* The Salt Lake hasin, in which lie Salt lake, Utab lake and Sevier lake. During glacial times thcre was a large expanse of fresh water in this hasin; and, according to G. K. Gilbert, at some former period, the waters of this basin rose so high that they overflowed to the ocean through Red Rock pass into the Snake and Columbia rivers; at this epoch its water-level was about 960 feet above the present level of the Great Salt Lake. *b.* The second sub-baein is the Humboldt basin, which lies between the Humboldt range and the Sierra Nevada. A number of smaller lakes and sinks, such as Pyramid lake, Humboldt sink, Carson lakś, Walker's lake, and others which dot tbs surface of the State of Nevada; and likewise Mono and Owen's lakes, in California, are included in the same general depression. The cstimated area of these two interior basins without outlet to the eea, is about 210,274 square miles.

Great California Valley.

Everyone is familiar with tbe fact of the existence in California of two great masses of mountains, one designated the Sierra Nevada, lying in the eaetern portion of the State, and the other the Coest ranges, bordering on the sea near the western boundary. Between the parallels of 35° to 40°, there is no difficulty in separating the Coaet ranges from ths Sierra Nevada.

The great California valley, composed of the Sacramento and the San Joaquin, varying in width from 40 to 60 miles, forms a striking feature in the topogrephy, heing walled in hy the Sierra Nevada on the one hand and the Coast ranges on the other. The hroad valley thus defined, forms a complete separation of the two systems of mountain chains. But, if we go south or north of latitudes 35° and 40° respectively, the condition of things changes. In the neighborhood of the Tejon nass, ahont latitude 35°, the ridges of the Sierra Nevada and Coast ranges come togsther, inosculate and become continuous, and topography alone, independently of geological considsrations, affords no clew to whsre ons csases and the othcr hegins. The same is the case with regard to these two mountein ranges north of the head of tbe Sacramsnto valley. North of Sbasta City (latitude 40° 35') the ranges close in on all sides, and in the labyrintb of chains thsre is no possihility of preserving the distinction bstween the Sierra Nevada and the Coest ranges. Within these limits and along an axial line heving a direction of north, 31° west, extending for a distancs of about 400 miles, the topographicel features of California assume a grand simplicity.

Nearly parallcl to each other we have: 1. The eastsrn slope of the Sierra Nevada extending into the State of Nevada. 2. The Sierra Nevada range of mountains. 3. The great valley of Celifornia. 4. Ths Coast ranges.

Passing north of California into Oregon, we come, in latitude 43°, to the two heautiful and fertile valleys of the Umpqua and Willamette, which here form almost as striking a esparation between the Cascade mountains on the east and the Cosst range on the west, as doce the great California valley.

Arid Regione.

In ths United Stetes tns regions of the great plains—the vast, treeless country thet stretches away from the eastern hass of the Rocky mountains and the great platsaus and basins lying west of the same range of mountains—constituts the arid areas, where agricultural operations are impracticahle without more or less irrigation. It has heen estimated that this arid region is more than one-third of the entire area embraced in the United States. From actual surveys and careful estimates, it would seem that it will not be possihle to redeem mors than thres per cent. hy irrigetion, whsn every brook, creek and river is utilized. Less than four per cent. of the region cen be said to be forest-clad. Thcse forests are restricted to the sides of the high mountains, and extend over the more elevated foothills. This does not include lerge areas covered with a scanty growth of dwarf cedars and pines, useful for fuel, hut of no value in mechanical industries. Over the remaining districts a large portion is covered with grasses and other plants, which may, to soms extent, he utilized for pasturags. Small valleys lying along mountain streams, will doubtless receive the most carsful and elaborate culture, affording fertile grain fields, vineyards orchards and gardens. The mountains, bills and plains will furnish nutritious hut scant pasturage for herds and flocks, but, after all, the agricultural resources of tbis vast area must he very limited. Gold, silver, copper, iron, coal, salt, and many other minerals are found in abundance; so that the rsgion will bs chiefly valuahle for its mineral wealth.

Cause of Aridity.

The mechanical causes of all terreetrial currents of air or winds must he sought for in the disturhance of atmospheric equihbrium produced by the unequal distribution of solar heat on the surface of the globe. Solar heat must, therefore, be looked upon as the "primum mobile," which originates and keeps in continual action the agencies which perpetuate ths atmospheric circulation. In other words the action of solar heat, combined with the very important modification produced hy the rotation of the eartb upon its axis, afforde a fnll and eatisfactory explanation, at least in a general and comprehensive view of the great eyeteme of winds. The operation of tbis good phyeical cause necessitates the general prevalence of weet winds near the eurface of the eartb in the temperate zones. The great water snrfaces are tbe chief sources whence the largeet supply of moisture in the form of aqueoue vapor is derived. The winds are the chief mechanical agente by which tbose vapors are wafted to distant points where they are condensed into rain or snow, dropping richness and fertility on our fields, and covering our hills and mountain slopes with veetments of verdure. The land is, directly or indirectly, tbe agent which bringe about the condensation of aqueous vapor. It accomplishes this result, either (as in the case of winds cerrying vapors up mountain slopes) hy forcing the vapors into higher and colder regions, or by creeting upward currents of air hy the action of solar heat, and thus conveying the vapors aloft into the colder regions of the atmosphere. Thus, in a general sense the oceans, seas and lakes constitute a vast vapor-furnishing apparatus, while the continents and ielands constitute a huge condensing apparatus; between them a gigantic process of distillation is carried on, which waters the earth and clothes the land witb vegetation. Moreover, it must not be forgotten that the great thermal influence emeuating from the sun alone has the power of putting in motion this immense apperatus. For the western portions of our territory, the Pacific oceen constitutes the great vapor-furnishing surface; ths prsvailing west winds sweep the vapors upon the lands lying to the east of the ocean, and tbe mountain ranges furnish the condensing apparatus. It is evident, therefore, thet all the aqueous phenomena of the atmosphere, embracing fog, rain and snow, mey bs rationslly accounted for hy attending to the three following considerations: (1) The position of hodies of water furnishing equeous vapor of greater or less tension; the degree of tension having relation to the temperature of the water. (2) The direction of the prevailing winds sweeping the vapor to regions of condensation or otherwise. (3) The configuration of the adjacent and remote lands, in promoting or opposing the operation of causes producing condsnsation of the vapors.

Applications.

These general pbysicel principles ars readily applied to the explanation of the aridity of ths extensive areas lying eest of the Sierra Nevada and Cascede mountains. Through the whole length of California the Sierra Neveda are lofty end continuous, presenting an almost nnhroken ohain, with an avsrage elevation of about 10,000 feet. This "great sea wall" almost complstely shuts off the moisture borne hy the vapor-bearing west winds coming from the Pacific ocean. The small amount of moisture thet surmounts the lofty snow-clad crests of thess mountains, is barely sufficient to produce a scanty precipitation of rain and snow from December to May each year, during the rainy season of the coast ranges. Hence we find east of this huge wall through the central portion of the State of Nevade, from the Mud lakes of the north through the Humholdt desert and the great Salt valley, and on the eouth to Death valley in California, a region of sxtreme aridity and barrenness. Most of this vest area is dreary and desolate heyond concsption, bsing nearly destitute of water and vegetation, fearfully hot in eummer, and occesionally swept hy terrible send storms. North of latitude 41° the Cescads and other ranges constituting the continuation of the Sierra Nevada mountains, have a meen elevation of only ahont 6,000 to 7,000 fest; so that a somewhat larger supply of moisture from ths Pacific ocean reaches the plateeus and basins lying between them and the Rocky mountains. It is principally for this reason that eastern portions of Washington Territory and Oregon and the whole of Idaho, although situated in northern extensions of the arid regions, receivs a somswhat lerger eupply of rain than corresponding districts in Neveda and California.

It bas already been remarked that thcre ars unquestionable indications, that in a former epoch a largs portion of the great basin was coversd with watsr. During the Champlain epoch thess arid plains were covered with immenss sheets of water, of which the existing ealine lakes are ths isolated rssidues. Hence it follows that the extreme dryness of climats now existing in thess regions did not always prsvail. Since tbe ahove-mantioned geological epoch there has been an increasing dryness of chmate over the whole of ths great basin. Is it still progressing, or has it reached its maximum of aridity? Is the great cycle of humidity returning upon these desert plains, and will they once more be clothed with vegetation at some future period? These are important questions in rslation to the future of tbs Pacific States.

There are certainly many evidences that during the past 25 years there has been a decided increase of rainfall and snowfall over a largs portion of ths great basin. Great Salt lake is known to have risen 14 feet witbin the last 25 years, thereby suhmerging large tracts of land on its flat margins; and chemical analyses show that its waters are progressively freshing. According to the ohservations of Clarence King, during only four years (1867-71) Pyramid lake has risen nine feet, and Winnemucca lake 22 feet within the same short period. In like manner Mono lake has risen 10 or 12 feet during the last 15 yeare. Tbe same ie said to be true of Walker's lake and of Owen'e lake. Additional evidence of tbe increasing snowfall in tbe Sierra Nevada is afforded by the fact that the glacial masses, which cover the flanks of its lofty mountain peake, seem to he advancing on the footbills. It would seem, therefore, that the rise of the lakes occupying the great hasin ie undouhtedly the result of a climatic cycle.

The momentous question for the future prosperity of the Pacific States is wbether the cycle is to he a long or short one; whether it is to he a geological cycle of augmenting rainfall and snowfall constituting a secular change of climate; or whether it ie to be only a climatic fluctuation of euch ehort duration ae to exerciee no appreciable influence or development of tbe vegetable and animal kingdoms.

Thie vital question cennot, from the want of sufficient deta, be answered at the present time. Our successors will, without doubt, he ahle after the lapss of sufficient tims to accumulats accurately-observed facts numerous enough to warrant the deduction of trustworthy conclusions.

Salmon River Country.

A Rich Country Suffering for Want of Machinery.

Ths East Fork mining district 55 miles south of Chellis, says the Salt Lake *Tribune*, is the continuation of the Bay Horse mining belt. In view of the many prospectors and others emigrating to the nortb, many of whom are settling in the Salmou River conntry, the general cher-acteristics of the section mey bs interesting, leaving the mines for future notice. It was hers in this district that tbe gap was closed in September of last year, thus making it, in connection with the Bay Horse helt, the longest known. Ths Wood River district, soutb of the East Fork, had heen prospected; the Kinni-kinnick eection on the north had bssn ths ecens of activity, but notwithstanding these facts it took all the summer of 1879 to detsrmine which direction the mineral helt ran. The discovery of the old Bible Back, Germanie, Warsaw and Independent ledgee afforded the solution of the prohlem and settled the direction hsyond all cavil. Subsequently the Alta, Kernac and Arctic lodss were located, forming a group of prospects, all carrying very high grade ores. The averags of tho whole East Fork district will he about 150 ounces to tho ton. Some of the rock, in fact, considerahls of it, carries ovsr 500 ounces, and ths lowest grade rock, taksn from any of tbs ledges, asseyed 60 ounces. The Eest Fork and Wood river head close together, in tbe same range, the outlst for ths ores from the formsr heing Wood river.

Owing to the East Fork district bsing situate close hy or upon ths boundary lins separating Alturas from Lemhi county, most of the locations made in East Fork havs besn recorded in Lsmhi.

Lumber is fonnd in great quantity, all kinds of pinss and euch trees as would bs naturally indigenous to ths country. The mill eites are countless, any number hsing found in tho district. The ores are smslting.

In Wood River district a town called Galena has been estahlished, being some 20 miles from the East Fork district. Doubtless it will hecome the headquarters for the Wood River aud East Fork mines. The ledges found at the head of Wood River havs not been developsd, and while the ledges ars emall, comparetively speaking, the grade of tbe ore, together with the position of the ledges, easily accssshle to the minss, render the properties very valuable. This district, liks the East Fork, is described to ue hy an enthusiastic admirsr of the country as "the miner's peradise." On both sides of the Wood River valley there have heen found high grade smelting ores for a distancs of 40 miles. Every few miles in the long vallsy, lerge creeks, abounding in trout, put in. Timher is as plsnty as in the Bay Horse district.

Frrther down, near the crossing of the old Boise road is the site of Jacob city. The mines situated in the vicinity of Warm Springs Creek, near Jacoh city, many of wbich are incorporated, are of ths same grade and character as the ores found in the upper camp and East Fork.

Camas prairis ie heing rapidly settled up by farmers, and ths influx of emigrante does not diminish. It is certainly one of the most magnificent agriculturel and stock-raising countriss to he found in the land. By the 4th of next July, good judges are free to express ths opinion, ths geography of thie portion of Idaho will be materially changed.

There is one drawhack to the rapid booming of the country at present, ths ahsence of all macbinery to reduce ths ores, and miners who are contemplating a departure into this district in hopes of bettering themselves and gaining a livelihood, should keep the fact wsll in mind. This cause operating there is no market tor the ores, and for several months, the Salmon river country will be a consumer. It is, however, a good country to stay with because of the extraordinary ore, of a very high grads, its numerous ledges and tbe facility for working them. These reasons will place this section among the foremost mining regions.

The Utah & Northern railroad taps this section within 150 miles and the probabilitiss ars that before fall a branch road will hs built from the Portneuf canyon across the lava heds to ths foothills, thence down tbo old Boiss road to Boise, and thsn on to Portland, Orsgon. The completion of this road will of course enhance tbe value of all kinds of properties, as machinery can readily be secured.

Gold in India.—The latest English advices speak of thc excitement over gold discoveries in southern India ae unahated. Some of the nugget storiee remind one of the earlier days of the California craze and in the district of Nevada. For instance, we read of pieces of gold as large ae a man's hand found in the Pandi river, and on the slope of Needle Rock range, nuggets as hig as two bands could compass. On the Pandi river, below Perishota crossing, layers of gold an inch thick have heen bronght to light. A column might be fillod up with eimilar statements.

The Engineer.

The Proposed Maryland Ship Canal.

The Congressional Committee, to whom was referred the matter of the proposed Maryland ship canal, will, in their forthcoming report, recommend the route across the peninsula, leaving the Chesapeake bay at Queenstowu, Md., and running across to Lewes, Del., discharging into Delaware bay five miles above the Delaware breakwater. The length of the canal by this route will be 51 miles. It will be 200 feet wide and 25 feet deep, and capable of accommodating the largest class of vessels. Its width will enable two of the largest steamships or sailing vessels in tow to pass each other with ease. There is no natural waterway, the entire line being excavated. In answer to objections, the report states that the canal is to be used by day or night, and will have no toll charges. It is proposed to have no locks other than tide locks. The report recommends an appropriation of $37,000,000, which is allowing a margin of $6,000,000; as from close and authentic calculations it is believed the canal by the route recommended can be built for $31,000,000. The advantages to foreign commerce are apparent. Vessels bound to any European port north of the Mediterranean can, by going through the canal, save 225 miles, which would otherwise be consumed in sailing down the Chesapeake bay and round the capes. This would make the trips of the regular foreign lines of steamships nearly two days shorter, and would in a similar manner expedite irregular marine traffic. The most important feature of the report is that it recommends that the canal be built under the supervision of the War Department, to serve the combined objects of harbor defence and an aid to commerce. Col. Kimmel, while serving on the Naval Committee, obtained an idea of harbor defence, on which he bases this part of his report. It argues that in the naval equipment of this country there should be two classes of vessels—one for "harbor defence," and the other "commerce destroyers."

Catamaran for Fast Passenger Travel on the Hudson.—A late number of the New York *Graphic* gives an illustration of a novel steamboat now building at Nyack, under the superintendence of Mr. Wm. Voorhis, of that place, formerly Commodore of the New York Yacht Club. The new boat is to be in the form of a catamaran, and it is expected that she will exceed in speed any ever constructed. She will have a double hull, 200 feet in length, while, as a whole, she will have 25 feet beam. Her engines will be of a pattern suited to the character of the craft, and turn a single wheel—to be placed between the parts of the double hull—of 8 feet in diameter, at the rate of 325 revolutions per minute. It should be mentioned that her hull, or, rather, hulls, are to be of iron, each 5 feet six inches in diameter and cigar shape. Of course it will be understood that she will have no cabins below the water as in the ordinary steamboat. On account of the peculiar boiler, Mr. Voorhis expects to be able, with perfect safety, to carry 125 pounds of steam to the square inch, whereas the common boats rarely exceed from 30 to 35 pounds. Great speed is expected to result from the following considerations: From the length and narrowness of the engine cylinders, giving great speed to the machinery, and from the shallow draft of water, the draft amidships being less than 3 feet and gradually diminishing to nothing fore and aft. In proportion to her displacement no other boat has one-third the power this novel steamer will possess. It is intended to use her as a passenger boat, and her carrying capacity will be 73 tons or about 500 passengers. She will have four bulkheads, comprising five air-tight compartments, which will be placed 9 feet apart, and the deck over her center will be 125 feet long, including a saloon of the same length and as wide as the vessel itself. In case Mr. Voorhis' new nautical venture turns out to be the great success which be anticipates, the so-called fast boats of the day will have to retire on their records and make way for the new era in steamboating on the historic Hudson.

Improving the Upper Mississippi.—There is a proposal before a Congressional committee to form large reservoirs on the head waters of the Mississippi, the water from which may be used to maintain the river at a navigable depth at all times. The St. Louis *Globe*, of March 27th, suggests that the reservoirs required already exist in the great lakes on the northern boundary, and that a canal connecting the head waters with the lower end of Lake Michigan, and large enough to sensibly affect the depth of water in the river as far down as Cairo, is quite practicable. A third suggestion is to so fence the banks of the river as to prevent the milkmen from having access to it.

There is more mining being done in Fresno at present, and more money is being taken out, than at any time during the past 15 years. Old abandoned ravines and gravel banks are being worked, and thousands of dollars are being extracted from them, while a number of quartz veins are being made to yield up their golden treasure. The mining future of Fresno county is looking very bright.

Useful Information.

Why Axle-Boxes Become Loose.

It has often been a question in the minds of many interested in using vehicles, as well as those who make or repair them, why an axle-box should become loose. This not only occurs upon vehicles which have been run for some time, but also frequently upon new carriages or wagons. There are several causes to which it may be attributed.

When a box becomes loose upon a new vehicle it is either the result of undue strain produced by the box becoming "set" upon the arm, or the hub having been green or not thoroughly seasoned when the box was set. An improperly-set box in a well-seasoned hub will not be likely to develop signs of poor workmanship so readily, as, having been tightened by wedges, it requires time and considerable usage to become loosened; but in vehicles that have been run for some time, a loose box indicates one that has been improperly set.

There is no reason why a box should become loose until worn out, and not even then if it has been properly set and was never strained by the axle-arm having become heated.

Many workmen pride themselves upon the rapidity with which they "box a set of wheels." The desire to excel in this particular often leads to faulty workmanship. If chiseled out with a gouge, there is frequently too much wood cut from the center of the hub, leaving but a small portion of the timber that forms the front end to hug the box; to tighten the back end, the sole dependence is placed upon the wedges used. The result is naturally a loose box.

The same difficulty frequently occurs even when a box-setting machine is used. I therefore would discourage the use of wedges for the purpose of tightening a box. It is a bad custom, that not only injures the hub, but covers imperfectly a faulty piece of workmanship. If, in a hub that is thoroughly seasoned, a hole of the proper size and shape is chiseled or cut out by the aid of a machine, as a receptacle for the box, which must be properly driven (white lead, mixed to the consistency of paste, being used as a cement to hold it), no wedging is required and no trouble will be experienced from the boxes becoming loosened. In order to do this properly the tire must be set with care and well trued, because, no wedges having been used, there is no opportunity for "truing the box" after having been driven. As I have remarked before, there is no reason why a box should become loose unless it is imperfectly set. It sustains no strain save, as stated before, in cases where the arm becomes heated. Although I make use above of the word "driven," boxes should rather be *pressed* in, as there is less liability of breakage. When this is done, the result is far more satisfactory than can be obtained by the use of wedges.—*Blacksmith and Wheelwright.*

Hints Concerning Saws.—A saw just large enough to cut through a board will require less power than a saw larger, the number of teeth, speed and thickness being equal in each. The more teeth, the more power, provided the thickness, speed and feed are equal. There is, however, a limit, or point where a few teeth will not answer the place of a large number. The thinner the saw, the more teeth will be required to carry an equal amount of feed to each revolution of the saw, but always at an expense of power. When bench saws are used, and the sawing is done by a gauge, the lumber is often inclined to clatter and raise up the back of the saw, when pushed hard. The reason is that the back half of the saw, having an upward motion, has a tendency to lift and raise the piece being sawn, especially when it springs and pinches on the saw, or crowds between the saw and gauge, while the cut at the front of the saw has the opposite tendency of holding that part of the piece down. The hook or pitch of a saw-tooth should be on a line from one-quarter to one-fifth the diameter of the saw; a one-quarter pitch is mostly used for hard, and a one-fifth for softer timber. For very fine-toothed saws designed for heavy work, such as sawing shingles, etc., even from soft wood, one-quarter pitch is best.

Hours and Minutes.—Why is one hour divided into sixty minutes? and each minute again into sixty seconds? Why not divide our time as we do our money, by tens, counting ten, or fifty, or one hundred minutes to an hour? This question was asked by an intelligent boy a few days since; and the answer given him may both interest and instruct other young people. The answer is this: We have sixty divisions on the dials of our clocks and watches, because the old Greek astronomer, Hipparchus, who lived in the second century before Christ, accepted the Babylonian system of reckoning time, that system being sexigesimal. The Babyloniane were acquainted with the decimal system; but for common and practical purposes, they counted by *sossi* and *sari*, the *sosses* representing sixty, and the *sares*, sixty times sixty, is thirty-six hundred. From Hipparchus, that mode of reckoning found its way into the works of Ptolemy, about 150 A. D., and hence was carried down the stream of science and civilization, and found the way to our dial plates of our clocks and watches.—*Selected.*

The Use of Glue.—Wheelwrights and others who use glue should remember that fresh glue dries much faster than that which has been once or twice melted. Dry glue, steeped in cold water, absorbs different quantities of water, according to the quality of the glue, while the proportion of the water so absorbed may be used as a test of the quality of the glue. From careful experiments with dry glue, immersed for 24 hours in water at 60° Fah., and thereby transformed into a jelly, it has been found that the finest ordinary glue, or that made from white bones, absorbs 12 times its weight of water in 24 hours; from dark bones, the glue absorbs nine times its weight of water; while the ordinary glue, made from animal refuse, absorbs but three to five times its weight of water.

Chemical science has recently succeeded in extracting the coloring matter from human hair. Diluted sulphuric acid is found to be the best solvent, and there appear to be three coloring pigments—yellow, red and black—all the shades being also produced by the mixture. It seems that in pure golden yellow hair, there is only the yellow pigment; in red hair, the red pigment is mixed with more or less yellow, producing the various shades of red and orange; in dark hair, the black is always mixed with yellow and red, but the latter are overpowered by the black—it appearing that even the blackest hair, such as that of the negro, contains as much red pigment as the very reddest hair.

To Remove Fruit and Wine Stains.—The following is a recipe worth trying for removing fruit and wine stains, especially peach and claret, from table linen: If uncolored, moisten with dilute sulphuric acid and then rub with a strong aqueous solution of sulphite or hyposulphite of soda; or soak for a short time in a strong aqueous solution of bleaching powder (calcium hypochlorite), press out excess of the liquid, and immerse in dilute sulphuric acid (1 to 10 of water); rinse in cold water, dip in hyposulphite of soda solution, and afterward wash out thoroughly in hot water. If colored, use plenty of soap-suds and ammonia water.

The introduction of magnets into all the great flouring mills has been a revelation to the millers who complained of wire in wheat. Not only have the magnets captured all the stray pieces of iron bands, and thus removed the last objection urged against iron-binding harvesters, but they have revealed the startling fact, that, of the scraps of iron and steel that find their way to the mill mixed with wheat, fully one-half are something besides pieces of wire, and of such a nature as to be even more dangerous to the mill machinery.

Coloring Brass Work.—Cleaned-up brass work, if left in damp sand, is said to acquire a fine brown color, which, when polished with a dry brush, remains permanent and requires little cleaning. Black, much used for optical brass work, is obtained by coating the brass with a solution of platinum, or with chloride of gold mixed with nitrate of tin. The Japanese are said to bronze their brass by boiling it in a solution of sulphate of copper, alum, and verdigris.

Good Health.

The Use of Condiments.

The general definition of this word is, "a pungent and appetizing substance, as pepper or mustard; seasoning. Something used to give relish to food and to gratify the taste." To the question, why do you use pepper on your food? you reply, because you relish the taste of the pepper. A little thought will, perhaps, convince you that you mistake its use. Is it not more probable that the addition of condiments brings out the flavor of the article of food on which it is placed. As a general thing pepper and mustard are not used on the fruits. Carrying out this view, if condiments are used simply to bring out fully the latent flavor of the dish, they could with equal propriety be used on fruit. This is, in fact, the case. To convince yourself of this, use pepper on strawberries, and you will find in them a flavor more delicious than you have ever experienced before. You will further discover that in this case you have not used the pepper for its taste.

The use of salt is as improperly understood. It is a natural preservative when applied to animal substances. The acid in the salt being the preservative element. When used with vegetable food, but not in such quantities as to cause a salty taste, it is a great improvement. In boiling corn or oatmeal without adding a little salt at first will cause it to have a bitter if not unpleasant taste. The addition of salt removes this rank taste and gives the appearance of smoothness. This is caused by the chemical action of the acid in the salt on the farina or starch.

We use pepper and mustard on food for the purpose of bringing out the flavor of the article on which it is placed. So with salt. A good test of this is boiled rice, which is perfectly insipid without the addition of salt. Many people prefer it flavored with sugar. It will be found that when sugar is used it will be far more pleasant and agreeable to the taste if it had been previously seasoned with salt, although not strong enough to detect the taste.

Climate and Complexion.—There is a great diversity of opinion as to the reason of the differences of complexion to be observed among mankind. Roughly speaking, the hue of the skin varies with the latitude. The fairer races having their homes at a distance from the equator; the darker, within or near the tropics. This fact would seem to point to the position of the sun with reference to those on whom he shines as the cause. But the question presents difficulties which this supposition does not aid us to solve. At the same distance from the equator we find the fair Englishman, the yellow Mongol, and the copper-colored Indian. To the north of the white Russian and Finn live the swarthy Lapp and Samoyed. North of the Caucasus are dark-skinned Tartars, south of it fair-complexioned Circassians. The aborigines of America vary less in color than the natives of the Old World. None of them are as fair as the Swede, none as black as the negro of Congo, and those living in Brazil, on the equator, are not the darkest. There are blacker men in Australia and New Guinea than in Borneo and Sumatra, though these islands are on the equator and those are not. The Shilleoks of the Upper Nile, who live about 10° north latitude, are blacker than the Monbuttoo, who are six degs. farther south.—*Popular Science Monthly.*

A surfeit in man is called founder in a horse, and is over-eating, eating more than the stomach can possibly convert into healthful blood. Wise men, and careful men will sometimes inadvertently eat to much, known by a feeling of fullness, of unrest, of a discomfort which pervades the whole man. Under such circumstances, we want to do something for relief; some eat a pickle, others swallow a little vinegar, a large number drink brandy. We have swallowed too much, the system is oppressed, and nature rebels, instinct comes to the rescue, and takes away all appetite, to prevent our adding to the burden by a morsel or a drop. The very safest, surest and least hurtful remedy, is to walk briskly in the open air, rain or shine, sun, hail, or hurricane, until there is a very slight moisture on the skin, then regulate the gait, so as to keep the perspiration at that point, until entire relief is afforded, indicated by a general abatement of the discomfort; but as violence has been offered to the stomach, and it has been wearied with the extra burden imposed upon it, the next regular meal should be omitted altogether. Such a course will prevent many a sick hour, many a cramp, colic, many a fatal diarrhœa.—*Hall's Journal of Health.*

The Secret of Beauty.—The true secret of beauty is health. Those who desire to be beautiful should do all they can to restore their health, if they have it yet. No one can lay down specific rules for other people in these matters. The work one may do, the rest he must take, his baths, diet and exercise, are matters of individual consideration, but they must be carefully thought of and never neglected. As a rule, when a person looks well he feels well, and when he looks bad he feels bad, as a general thing. There are times when one could guess, without looking in the glass, that his eyes were dull and his skin was mottled. This is not a case for something in a pretty bottle from the perfumer's, or for the lotion the circulars praise so highly. To have a fresh complexion and bright eyes, even to have white hands and a graceful figure, you must be well. Health, and the happiness that usually comes with it, are the true secrets of beauty.—*Quarterly Review.*

Petroleum for Coughs.—Dr. Moubre, writing to the *Gazette des Hopitaux*, gives his experience of petroleum capsules in simple and chronic bronchitis. This balsamic had been brought before the Therapeutic Society by Dr. Blache a year ago, at the suggestion of a Paris chemist, who named it Gabian oil, in order to prevent public prejudice. Each capsule contains 25 centigrammes of pure petroleum, the ordinary oil not being used, as it has to be distilled in contact with sulphuric acid to render it fit for lighting purposes. At the Hopital Beaujon, where these capsules have been freely ordered for chronic bronchitis, a rapid diminution of the secretion and fits of coughing were observed. In tuberculosis this medicine gave encouraging results.

A Fatal Italian Disease.—An Italian correspondent of the *Lancet* calls attention to an insidious and frightfully fatal disease called "pellagra," of which no less than 97,000 Italians are said to be dying, at the present time, the number of victims representing 3.62 per 1,000 of the whole population, and in the infected departments, especially in Lombardy and Venice, a higher proportion than ever occurred during the worst cholera epidemic in France. The disease usually runs a slow course, like consumption. Its cause is believed to be the exclusive consumption of maize in a deteriorated condition and the unhealthy state of the hovels in which the rustics live.

Sudden Death from Electric Shock.—A serious illustration of the risk attending electric shocks, even when apparently slight, occurred recently in New Haven, Conn. A gentleman was induced to try a shock, "just for fun," from the machine of an itinerant peddler of electricity. He turned away, but had not gone far when he was seen to stagger and fall. He was picked up unconscious, and remained so until he died, two days after. The physicians pronounced it a case of apoplexy, superinduced by the electric shock.

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SAN FRANCISCO:
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Business Announcements.

Postponement—Atlanta Mining Co.
Pianos and Organs—Daniel F. Beatty, Washington, N. J.
Dividend Notice—Standard Con. Mining Co.
Annual Meeting—Pioneer Con. Mining Co.
Improved Grounds for Sale—C. Fieldsted, San Jose, Cal.

The Week.

Our interior exchanges continue to record frequent discoveries and etrikee in variouе mines. Nearly all over the coast an era of prospecting has set in with the opening of spring. The pleasant weather which has prevailed ie melting off the snow in many places, and many minee have started np which have been retarded in their operations.

There is considerable talk just now of working the low-grade ores of the Comstock. Several yeare ago we contended that it was bad policy to gut the mines of their rich ore so as to get the greatest possible yield in the shortest possible time. A eystem of concentration should have been adopted long ago, and it is well that necessity is bringing the question forward more prominently. Working low-grade ore necessitates an economical management and the carrying on of work on etrict business principles. When this is done the Comstock will again hecome prominent. At the same time there is alwaye a chance for a bonanza.

In another column will be found a notice of a new proposition in relation to the mining laws, making a distinction between "blanket lodes" and ledgee. The subject has been brought np again in Congrese this week and is etill under discussion.

The Gunnison country, in Colorado, is still attracting great attention, and a "rnsh" there will no douht soon take place.

At a meeting of the Cabinet, lately, the threatened invasion of the Ute reservation for mining purposes was the snbject of a somewhat protracted discussion. It was decided to send Gen. McKenzie and his forces into the reservation, to prevent a collision between the whites and the Indians.

The Fort Meade Hydraulic Co., Dakota, are running a tunnel through the monntain 10x10, some 450 feet long. By eo doing they will be able to strike about 25 feet below bedrock on Rapid creek, which carries about 4,000 inches of water. When completed, the river will flow through this tunnel in two 4x4 flumes.

One hundreo and fifty placer miners, witbin ten miles to Prescott, Arizona, are taking out from $4 to $20 per day to the man.

Mechanics' Institute Fair of 1880.

The presnt year promises to be one of unsual activity in all onr productive indnstries, and, therefore, one of satisfaction to all who have the best interests of the State at heart. Recognizing this fact, we nnderstand that the managers of the Mechanics' Institnte, of this city, have resolved to put forth extra exertions to maks this year's exhibition a fitting exponent of the character of the year in our fields, our work shops and onr social and esthetic life. They have issned an annonncement which clearly outlines thsir pnrposes and their expectations, and in order to aid them in intsresting our readers wbo are engaged in the varions arts and indnstries, we pressnt the leading portions of their address to tbe people of ths Pacific coast. Successful and nsefnl as these exhibitions have been in former years, and favorable as their influence bas undonbtedly been on the various industries of the coast, it is believed that the Fifteenth will exceed all others in importance. The long night of depression and stagnation in the industrial world is now coming to an end, and already the signs of a bright dawn of prospsrity are ssen on every hand. Undsr these circumstances it bshooves every inventor, every merchant, every mannfacturer, to bestir himself, to make known ths nature of his specialty, to bring it under the direct notice of tbe public in an impressive manner, and above all, to give what guarantes he can of the excellence and superior quality thersof. To aid him in doing thess things, the Mechanics' Indnstrial fair offers nnequalled advantagas. The vast size of the pavilion, with its floor area of 190,000 square feet, its fins engine with free steam power, whereby inventors and mannfactnrers are snabled to exhibit their machines in actual operation, its ease of accass from all parts of ths city, by means of six lines of street cars, the immsnse multitudes of visitors, averaging 300,000 for each fair, from all parts of the coast—these together are inducements snch as can be found nowbere else west of Chicago.

It is hoped that ths awarding of premiums this year, oonsisting of gold, silver and bronze medals and diplomas, will be an additional inducement to exhibitore to pnt forth their best efforts, giving, ae they do, a gnarantee of merit, the value of which can scarcely he over-eetimated.

To visitors is offered a combination of attractions more than sufficient to well repay them for their ontlay. There will be gathered together the natural productions of the entire coast, examplee of the mannfacturing skill of our artisans, embodied thoughts from the brains of our inventors, the works of genius of our artists—an epitome, in fact, of all that man and nature combined bave done on the Pacific coast. For the pleasure seeker, pnre and eimple, a trained orchestra, nnder competent leadership, will disconree eweet music; while in the horticultnral garden, ferns and exotic plants, orange, lemon, and other snb-tropical trees, with a constantly renewed supply of beautiful cut flowers and fruits, will offer attractions of a not less pleasing kind.

One of the leading featnres of the fair will be the art department, wbere, in a spacione, well-lighted gallery, will be displayed the finest works of onr band of local artists, some of them of world-wide fame, with not a few gems from other lande and other times. Thie department has alwaye been eepecially interesting, aud no effort will be spared this year to make it worthily represent the art cnlture of the Pacific coast.

No charge of any kind is made to exhibitors for epace, steam or water. Goods arriving before the opening of the exhibition will be etored free of charge. Blank applications for space, a copy of the rnles and regulatione, premium list, and any other desired information, will be giveu on application to tbe Secretary, J. H. Culver, 27 Post etreet. Mr. J. H. Gilmore is Snperintendent. The Board of Managere is composed of tbe following gentlemen: P. B. Cornwall, President; A. W. Starbird, Vice-President; J. A. Bauer, Treasurer; A. L. Fish, C. Waterhonse, Jamee Drury, Nathaniel Hunter, F. A. Frank, David Kerr, Samuel Dnnsmore, J. R. Wilcox, Geo. H. Hopps, Edwin Fretwell and George Spanlding.

Speaking of the Skagit mines, the Victoria *Colonist* eaye: One miner has started to slnice, and exhibited to a vieitor quite a large quantity of coarse and fine gold which he bad jnet taken from the slnices. A company of miners, one of whom had been assisting Mr. Derley, offered him $10,000 for his claim. The offer was refnsed. Another miner reports that there are only about 150 men in the digginge all told, and they are waiting for the enow to melt. Some have set rockere on the eide hills, and when the snow starts to melt will go to work. The hills prospect well. Mr. Algar packed in quite a eupply of provisions, which he stowed away to be nsed when he goes back to work his claim in June. He says there are plenty of claims nntaken, but miners are now going in from both waye, and the ground is being rapidly taken np. Tbe eaw mill has been packed in as far as the month of Ruby creek, and will be at its destination in a few weeks more.

The Gold Hill *News* estimates that 5,000,000 gallone of water is being daily raised from the Comstock mines.

Arizona.—No. 2.

Facilitiee for Travel and Traneportation.

Befors the railroad was constrncted, ths journey from fort Ynma to Florence was both disagreeable and dangerous. The mountains to the south and southeast were the home of the fierce Apache, and roving bands of Mexicans, crossing the border from Sonora, frequently robbed and murdsred travelers along this route.

On three occasions, the stage was stoppsd by a single bold bandit, Brazelton by name. A story is told to ths effect that a passengsr who had bsard of a previous robbery was extremely anxious that the driver should show him how and where it had occurred.

Approaching a grove of trees, the driver said: "Yon ses those trees yonder; it was among them that be was hidden; behind that very tree, and—by Jove—there he is again!"

"Yes, here I am again!" shonted the robber, leveling his shotgun, "and all of you throw up yonr hands!" Brazelton was killed by a deputy-sheriff and posse, soon aftsr. His whsrsabouts were discovered by means of an accomplice, and he was riddled with bullets befors he could respond. He carried a perfect arsenal of firsarms.

But the Apache, tbe Mexican cnt-tbroat and the road-agsnt wsre not the only amenities of the road. The only conveyancss were lumbering wagon-like stages and "jerkies," in which the passengers, crowded together so that they could scarcely move a limb, endnred for three days and thrse nights the pelting heat and drifting clouds of sand. So great is the abrading power of this continuons sand-blast, that already soms of the telegraph poles are partially cut by it.

In thoss ante-railway times every ton of ore forwarded from the Pioneer distriot cost $100 bsfore it was landed in San Francisco. But before many months the Sonthern Pacific will be completed to the San Pedro, where, at a fnture town, whicb has alrsady bsen named Benson, about eight milss south of the Pres Alamos, a very largs proportion of the ore of southsrn Arizona, including that of the rich Tombstone and Hnachuca districts, will be shippsd for San Francisco, and a vsry large part of the supplies for the mines and snrrounding agricultnral districts will be landed.

It is probable that the Atchison, Topeka and Santa Fe railroad will ultimately join the Southern Pacific near Tucson, passing northward thence through the valley of Gold Caoyon creek, by old Camp Grant and along the San Pedro to the Gila, thence along the Gila canyon to San Carlos and northeastward to Fort Apache, St. John in the Little Colorado valley, aud Zuni. The traffic of northern Arizona reaches and leaves the Southern Pacific at Maricopa Wells, where there is a large depot and freight-house. A company has been formed, under the name of the Arizona Central Railway Co., to build a railroad, owned in the Territory, from Maricopa to Phœnix, and thence to Prescott. From Maricopa to Phœnix this will pass over a perfectly level oountry.

From San Francisco to Fort Yuma along the railroad the distance is 730.9 miles, from thence to Maricopa 156.3 miles, from thence to Tucson 91.2 miles, and from Tucson to the futore town of Benson 46 miles. The total length of the track of the South Pacific railroad in the Territory is 383.3 miles. The proposed route of the Atchison, Topeka and Santa Fe will give Arizona about 240 miles of the iron track, while the Arizona Central will nave a length of about 130 milee, making a total of about 753 miles in the Territory.

Fort Verde, Prescott, Wickenburg, Phœnix, Maricopa, Camp McDowell, Florence, Tncson, Fort Bowie, Camp Tbomas and Fort Apache are connected by the U. S. military telegraph.

The Southern Pacific was opened to Yuma on October 20, 1877, to Maricopa April 28, 1878, and to Tncson on or about March 24, 1880. The traveler, leaving San Francisco at 4 P. M. on Monday, reachee Los Angeles at 1:55 P. M. on Tuesday, and Tncson at 11:55 on Wednesday. The fare to Tucson is $69 first, $59 second and $49 third class.

Hietory and Antiquities.

The early history of Arizona hae still to be written, but it is in moet reepects identical with that of southern California, New Mexico and northern Mexico. That the original inhabitante belonged to the same civilization as that under which Mexico rose to eo comparatively high a grade long before Cortee landed on its ehores, is usnally conceded, but whether the bulk of the people removed southward toward the coneolidated empire of the Aztecs before the conquest of Mexico by the Spaniards; whether they remained and were swept away by the Spanish invasion from the eouth; or whether the Apache from the north drove them out of the open lands into the recesses of the canyons, and finally extinguished all bnt the few pueblos still remaining, is not certainly proven.

Probably the truth lies between the three alternatives, and all the canses may have contribnted to the depopulation of the country and to the ruin of the extensive cities, dwellings, canals, etc., which strew the plains and line the sides of the canyons. To the stndent of history nothing in Arizona eqnals in interest these architectnral remains. Now that the railway is finished, many of these are comparatively accessible—the famons Casa Grande being only a few miles from the station of that name, while numeroue other rnins exist in the districts around Florence and Phœnix.

A few miles from Phœnix are the ruins of two or three towns and the remains of two stupsndons canals, one of which is 40 fset wide, and in former times drsw its supply of water from the river nsar the monntains, 20 miles distant. In this neighborhood are also the ruins of a bnilding occupying a parallelogram of 26 feet by 130, with walls still over 10 fest high. At from 12 to 14 miles of Phœnix, at La Tempe, are remains of what mnst have besn a popnlons city, and also anotbsr system of canals and reservoirs. Ruins of a similar dscription to those of Casa Grande have besn found in the Rio Verde valley, on Pueblo creek and at Aztec pass.

Casa Grande, discovered by Father Kino, 300 years ago, is situated near the Gila, a few milse from Florence. The main bnilding is about 55 feet square, and four stories in hight, witb traces of two more stories. Eacb story contains five rooms, two 35x10 feet, the other three 24x 9 feet, and all of them nine feet in hight. The opsnings which once ssrved for doors ere three feet and one-half bigh, two and one-half feet wide at the base, and two feet wide at top. The whole of the intsrior is neatly plastered, the plaster perfect as when first put on. This building is surrounded by a wall, whicb, when perfect, was perhaps 15 fest high, and six fest thick at the hass, and within this are ssveral smaller apartments, bsides a sort of watch tower at the soutbeast and sontbwest corners.

The towns of the Moqni and Znni, the former in tbe north of Arizona, and the latter just over the border in New Mexico, are in so many respects similar to the ruins scattsred on plain and canyon, that they svidently bslong to the same civilization; but whether the Indians are the remains of a separate tribs, or the remnants of many tribes is one of the problems of the history of America.

In the Gila valley, 120 miles from Tucson, are the famous Pisdras Pintadas. A heap of rocks, about 50 fsst high, is coversd with rude figures, geometric, comio, anatomical. Here are sqnares, circles, crosses, triangles, snakes, toads and vermin; men without heads and dogs without tails. The sketches show considerable similarity to those of ths Aztec Calendar Stone in Mexico. It is a tradition with the Indians that those stones were put there in the time of Montezuma to record treaties bstween different tribss.

The "Indians" of Arizona evidently belong to sevsral very diffsrent stocks. The wild Apache, formidable for his stealthiness and treachery more than from his unmbers; the peaceful, not easily provoked, yet brave Pimo; the indnstrioue Papago; and the town-dwelling, family-loving, orderly, clean and self-contained Mogui, have little in common. The distance which separatcs the rude Apache from the Moqui, with hie old and reepectable civilization, is as great as that between the rude tribes of Siberia aod the cultivated Japanese.

The ruins in the canyons, on almost inaccessible terracee, are believed, by Major Powell, to be more recent than those of the plains. He helieves the peoplo took refuge there to escape the Spanish incnrsions.

Early Mining.

In an old Spanisb work, entitled "Apostolio Labore of the Society of Jesus," the finding of gold and silver in the Santa Rita mountains is thus narrated:

"In the year 1769, a region of virgin silver wae discovered on the frontier of the Apaohes, a trihe exceedingly war-like and brave, at the place called Arizona, on a mountain ridge which hath been named by its discoverers Santa Rita. The discovery was made known by a Yaqui Indian, who revealed it to a trader of Durango, and the latter made it public. Newe of such surprising wealth attracted a vast multitude to the epot. At a depth of a few varas masses of pure silver were found, of a globular form and one or two arrobas in weight. Several pieces were taken out weighing upward of 20 arrobas; one found by an inferior official attached to the government of Guadalajara weighed 140 arrobas. (An arroba is 25 pounds.) Many persons amassed large sums; wbilst others, though diligent and persevering, found little or nothing. For the security of thie mass of treasure, the captain of the Presidio of Altar sent troops, who escorted the greater bulk of this silver to headquarters, whereupon this officer seized the treasnre as being the property of the crown.

"In vain the finders protested against this treatment, and appealed to the audience chamber at Gnadalajara, but for answer the authorities referred the matter to the court of Madrid. At the end of seven years the king made the decision, which was that tbe silver pertained to hie royal treasury, and ordered that thenceforth the mines should be worked for hie benefit. This decree, together witb the incessant attacks of the hostile Indians, so discouraged the treasnrehnnters that the mines were abandoned, as needs must be until these savages are exterminated." From that day nntil within the laet few years the Apaches finally beat off all those who penetrated into their land in search of gold.

South-east of the pnehlo of Tubao the Jesuit padres erected the Mission Tumecarori, almost in the beart of the Apache country, and there cultivated sanctity and the pursuit of worldly riches with much snccese for a while; but one day the red man surrounded the building witb fire and knife, and not a padre lived to tell the story. All the tribes of the Apacbes, whether Coyetero, Tonto, Chiricahna or Moggolone, were united in the endeavor to keep from the sight of the white invader the riches of southern Arizona.

Fraser river canneries are running on full time.

El Capitan—Yosemite Valley.

We give herewith a spirited view of one of the gate-posts at the entrance to that most wnnderful of all the mountain valleys of ths world, the Yosemite. This stnpondous mass of naked granite is known as El Capitan. Directly opposite, bnt not shown in our engraving, are the Cathedral rocks; the two forming the gateway nr entrance to the vallsy beyond. The space between these great masses nf rock comprises the nsrrowest portion of ths valley, and thrnugh it runs the Msrced river. Whether the visitor snters the valley by way nf ths Conlterville ronte from the north, or by that from Mariposa nn the south, the first and most prominent nhjsct which msets the eye, as he dosconds from the mountain, is the towering mass of El Capitan, rising above the floor of ths valley abont 3,300 fcst, with an almost perpendicnlar ascent. The sides nr walls are bare, smooth and entirely destitnte nf vsgetation, presenting at the top a sharp, olearly defined edge, with here and there a stunted tres standing out in wsird and sharp relisf against the blue sky beyund.

It is difficnlt, even while viewing this hugs mass nf granite, to form anything like an adequate idea nf eithsr its bulk or hight. Thsre are nthsr points in the vallsy which are of greater altitnde, hnt nothing which an impresses the beholdsr with its immonsity and grandeur. This effsct is produced by the boldness with which it stands ont from the mountain mass nf which it forms a portion. There is probably no othsr instance, on any largs scale, whers a section of an immsnse mountain is sn fully isolatsd and so completely exposed to view from crown to base.

Many nf nur readers have sesn Bunksr Hill monument, an immsnse granite obelisk, 220 feet high. It wonld take fifteen such struotnres, piled ons npon the other, to reaoh the summit of El Capitan.

The Indian nams of this rock is *Totokamula*. Sevsral interprstations nf that name have been given, one of which says the sonnd of the word is in imitation of ths ory nf the crans, beoause in winter that bird usually flies over this rock as it entsrs the valley from the snowy regions above and bsyond. A seemingly more appropriate signification is that this Indian term signifies El Capitan, or, as we might say, "the higgest fellow of them all." Whitney, in his Yosemite guids book, says, it "seems as if hewed from the mountain on pnrposs to stand as a typs of eternal massiveness. It is donhtful if anywhers in the world there is pressnted so squarsly cut, so lofty and so imposing a face of rock."

The Yosemite vallsy is fast becoming the Msoca of all pilgrimages tn the Pacific coast. There is something there hesides towering cliffs and mountain torrents lsaping from dizzy hights—something more and beynnd these and all the other myriad charms of mutely creeping river, mirrored lake and overarching boughs nf tangled wood. There is a grandenr in its bsanty which is found no whsre else on earth. The visitor is impressed with a subtle, mysterious, indescrihabls fesling of awe, which, howevsr much he has traveled, he has nevsr met with elsewhers. While in this valley, the cares and business of the world sesm as completely shut out from the mind as though we were transplantsd to some nsw and grander sphers—to some world beyond this lower earth. All powers of description seem powerlsss to portray the immensity of the scenes which meet ths eys on every side.

Nature in its grandest aspects may he studied here. The geologist finds hsre ampls room for the highsst powers of scientific investigation in his particular line. Quite a number of scientists have studied and writtsn and published the results of their investigations; but, ths writer ventures the opinion, that John Muir has more rightly than any othsr interpreted the mode of nperation by which ths Grent Landscaps Builder has carved nut this wonderful valley of the Sierras. According to his interpretation of the writing upon these grand old colossnl walls, the glacier—that great plow nf the Almighty—has left its mark upon both the wall and floor of the valley in a manner too plain to be ignored. The fanciful idea nf volcanic disturhance and snbsidence seems tn have littls weight in the minds nf scientific men since the publication nf John Muir's letters from the Yosemite.

The Yo-emits valley is a unique and wonderful locality; it is an except onal creation, aud as suoh has been exceptionally and most appropriately provided for, jointly, hy hnth the State and nstion. It has been made and declared a nntionsl public park, snd placed under the immediats charge of the State nf California. The State, through its Legislature, has assumed ths responsibility of the charge, and has solemnly prnmised tn care for it, and hold it "iusliensable for all time," for the henefit nf the people, and for "public use, resort snd pleasure." The nnmber of visitors is annually increasing; but with that increase there seems to bs also a growing addition to those vexatious restraints and annoying charges, which are sn universal at nearly sll placos of great rsort. If the Stato would have this place "a joy forsver," a more liberal policy should be inaugurated. Every trail, road and bridge should hs free. Guide hoards should bs erected at evsry needed point for ths full information of visitors, to the end that every reasonable fscility should he offered for the fullest enjoyment of nature in this, one of her greatest resorts, altogether unrestrained except by the requirements of decency and order.

VIEW IN THE YOSEMITE—EL CAPITAN AT THE ENTRANCE TO THE VALLEY.

During the month of April the local incorporations declared dividends amounting in the aggregnte to $613,366; of this sum, $130,000 was paid by banks, $199,166 by gas and water companies, $44,000 by insurance companies, $35,500 by powder companies, $5,000 by railroad companies, and $279,700 by mining companies. In April, 1879, dividends amounted to $733,666.

Academy of Sciences.

At the regular ssmi-monthly mesting of the California Acsdomy of Sciences, on Monday evening last, Mr. Hsrmann Wenzsll exhibited his system of pneumatic clocks, by which tims is transmitted to any numbsr of sympathotic clocks within a modsrate area, by means of ths pulsating pressnre upon the column nf air confined in small tubes. Hs described tho various difficultiss enconntsred in its dsvelopment, nntil hs finally applied the principle of mechanical clock-work, nsed to operate a lever acting on a syphon, immorsed in glycerins. His great difficulty wss to overcomo the contraction and expansion of the column of air in the tube, and the glycsrine in the jars of the pnmp. This hs now claims to have dons, to a reasonable extent, sufficient for ordinary practical use in buildings, but not for use, it is thought, at any very great distances. In each immediats neighhorhood a regulator clock would bs required to direct twenty, or thirty or fifty dependent dials. Ths west wing of ths City Hall is furnished with them, while ths east wing has electric clocks. Ths pneumatic pipes should he placed inside the walls when houses are built, although thcy can bs added afterward, but not as well, and ars liahle to the same risk of leakage as gas and water pipes, with this additional inconvenience, that any lcakage would at once impair the correct action of the connecting dinl. They have this advantage, that one good regulator clock, with a long pendulum, in a building, will regulate and propel a nnmber of dials in its several rooms, and no ticking his heard, except hy the regulator, which requirss winding once a week. By means of models ths workings of the systsm were explained. Mr. Wenzell stated that he had been ab'e to drive clocks with air tubes two miles in length. In his explanations he took occasion to doubt the accuraoy of electrio clocks.

In ths discussion which ensued, Prof. Davidson, ths President of the Acadsmy, stated that in his npinion the elasticity of ths column of air employed as n medium, was a fatal objection to the uso of ths pnsumatic clock for any scientific purposes. He thought the utmost limit of its use would not sxceed a couple of miles, and then with s result too inaccurate for exsct scientific obssrvstions. Hs said the electric clocks used by astronomicsl observatorios had run a year with a variation of only seven ssoonds, and clocks movod hy a current of electricity moving through a circuit of 7,200 miles, had only vnried one-tenth of a second in any one night. A part nf this smsll error is due to the time consumed in the trsnsit of ths electric fluid, small though it be. Throughout Europs, elsctrical clocks have been adopted and used in transmitting time from one obssrvatory to another, when calculating longitnds. Ths time is sent nll ovsr Great Britain daily at 1 P. M. from Greenwich observatory, and ths entire country uses identical time, without allowance for difference of longitude. The pneumatic pressurs is subject also to variation from two high and two low harometric tidss a day, which cannot be compsnsated nor guarded against. It may answer for keeping ordinary currsnt time in a building, hut can nsver be of uss for scientific or astronomical purposes. Prof. Davidson then described the electric clock system of Paris, where every clock is moved each second; and ths clocks of precision used by astronomers, whsrs a har of steel, weighing 53 pounds is movsd a quarter of an inch in its arc of vibration, thus giving a mors rapid and exsct result than ths usual electric clocks of commerce. It is necessary to obtain as short an impulss as possible for all clocks used in astronomical work. Mr. Molera said the publio clocks of Paris were about being so changed as to be regulated hereafter only once an hour by ths common electtic impulss from ths central regulator. Prof. Davidson ssid he had recently been called to examine a new system of electric clock, recently invented in this city, not yet hrought out, whose action appeared to him to bs about psrfect, and it could be attached to any two-dollar Yankee clock anywhere, snd would give perfect time.

Mr. Wenzell explained that his system was not intended for scisntific purposes. It was intended for public buildings or places whers n number of dials were needed, and which he could opsrate from one movement. In this hs had succeeded muoh better than the electric clocks, since his did not get out of order, while ths electric clocks were being continually repaired. They were moreover inaccurate. He mentioned a number of places where his system had been in use for some years, and whereve used it had given perfect satisfaction. He is about to go Esst and introduce his invention thers.

Placer County.—All of the gravel mines on the north divide around Iown Hill and Dutch Flat have commenced work. Water for washing is abundant, and a large amount of gravel will he washed this season. On the Forest Hill divide the landslides of ths late storms are delaying work. The Pemherton is running about 600 inches of water on surface gravel, which averages 15 cents to the cubio yard. The Newcastle hydraulic mins, which is located about two miles from Pino, commences piping this week. The ground, though very rich, has not been worked for mauy years. Ths quartz excitement about Auburn still continues, and new ledges are being prospectsd ovsry week. From one of them the fortunats owner exhibits a handful of specimens containing over $300.

It is not helieved that the invasion of the Ute reservation can be prevented. Schnrz fears another ontbreak. The miners are determined to enter the reservation. Ths troops ars sent out to keep matters as quiet as possible till Congress ratifies the agreement with the Indians.

Large ledges of coal have been discovered on Sun river, Montana.

Low Grade Ores at Silver Cliff.

Through the courtesy of Mr. Perkins, the accommodating Superintendent, we were enabled yesterday to visit the Silver Cliff mining and milling company's gigantic stamp mill, and to examine the workings of the institution. It is the prevailing impression that when the mill was pronounced finished, it was complete, but such is hy no means the case. At first it could not be run at a capacity of more than eighteen or twenty tons per day to advantage. Many alterations and improvements were necessary, aud in accomplishing this, and iu hringing the mill up to its proper capacity, has required much labor, expense and good judgment in management. The first month's work was more of an experiment, but during the month of March the product was in the neighborhood of thirty thousand dollars. The capacity has been gradually increased until now the average daily run is hetween fifty and sixty tons, out of which the company realize ahout $2,500 per day.

The visitor to the mill is at once impressed with the magnitude of its workings. The noisy din of the forty stamps, the roar of the crusher and amalgamating pans, and the constant grinding of the "settlers," fills one with confusion, until he hecomes accustomed to it.

When the mill was first started it was found that much of the gearing was out of proportion, and to remedy all these defects has since been the constant study and aim of Mr. Perkins. At first the stamps were only made to drop sixty-five times per minute, while now they drop ninety times per minute. This improvement was effected hy altering the "cams," or small arms which raise the stamps. The revolutions of the pans have been increased from fifty-two to eighty-six hy lagging up the pulleys and changing the hevel wheels. At first it was necessary to run the 200-horse power engine at the rate of ninety revolutions per minute, but by means of these alterations the speed has been decreased to seventy-five revolutions per minute.—*Silver Cliff Prospect.*

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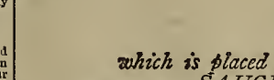

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ARTHUR SEWALL.....Pres't Bath Nat. Bank, Bath, Maine
BENJAMIN G ARNOLD.....of B. G. Arnold & Co.
HENRY M. TABER.....of G. O. & H. M. Taber
CHARLES E. PARKER.....of Gay & Parker, Boston, Mass.
R. M. PULSIFER..Proprietor Boston *Herald*, Boston, Mass.
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Parties having good mines for sale will please communicate direct with me, and send full particulars.
EDWARD BATES DORSEY, President.

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SUCCESSOR TO
La Grande Laundry,
PRINCIPAL OFFICE:
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Thirteenth street, bet. Howard and Folsom,
SAN FRANCISCO.
All ordinary mending, sowing on buttons, etc., free of charge. ☞Orders left at the office will receive prompt attention. Work called for and delivered to any part of the city free of charge.

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For the Purpose of Reeleting Encroachmente upon
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All communications should be addressed to "MINERS' ASSOCIATION," No. 320 Sansome street, Room 23, San Francisco, Cal.

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CONTAINS 113 ROOMS.
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This House is especially designed as a comfortable home for gentlemen and ladies visiting the city from the interior. No dark rooms. Gas and running water in each room. The floors are covered with body Brussels carpet, and all of the furniture is made of solid black walnut. Each bed has a spring mattress, with an additional hair top mattress, making them the most luxurious and healthy beds in the world. Ladies wishing to cook for themselves or families, are allowed the free use of a large public kitchen and dining room, with dishes. Servants wash the dishes and keep up a constant fire from 6 A. M. to 7 P. M. Hot and cold baths, a large parlor and reading room, containing a Graud Piano—all free to guests. Price single rooms per night, 50 cts.; per week, from $2.50 upwards.
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$500,000
To loan, in one sum or in amouuts to suit on Wheat Lands, Wheat in Warehouses, and other good collaterals at current rates of interest.
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Near First and Market Streets.

Ores worked by any process.
Ores sampled.
ASSAYING in all its branches.
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WORKING TESTS MADE.
Plans furnished for the most suitable process for working Ores.
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Importers of and Dealers in

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We would call the special attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our stock of Clay Crucibles, Muffles, Dry Cups, etc., manufactured by the Patent Plumbago Crucible Co., of London, England, for which we have been made *Sole Agents for the Pacific Coast.* Circulars with prices will be sent upon application.
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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.
☞Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application.

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ROASTING FURNACE

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Ore Pulverizers.

(Awarded the Premium Gold Medal at Naples, Italy.)

The furnace is especially adapted for roasting rebellious ores; there are more than fifty in use in Colorado, giving perfect satisfaction.
The Ore Pulverizer is built in different sizes. It is preferable to Stamp Mills because it requires less power and less repairs than Stamps. No extra expense for setting up, and no foundation. Less weight and less cost than stamps.
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Ores Sampled and Assayed, and Tests Made by any Process.
Assaying and Analysis of Ores, Minerals and Waters.
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Practical instruction given in Treating Ores by approved processes.

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Ingersoll Rock Drills.

In use in the largest and best Mines of the Coast.

HAS AUTOMATIC FEED.

Has less Repairs.

Is Lighter and more Easily Adjusted than any other Drill.

Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.

MINERS' HORSE-POWER.

This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.
The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing

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HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a bigb mountain from summit to base.

No. 1 XX) is the Strongest Explosive Known.
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FROM 1-4 TO 10,000 lbs. WEIGHT.

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An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
12,000 Crank Shafts of this Steel now running proved superior to wrought iron.
CRANK SHAFTS, CROSSHEADS and GEARING, specialties.
Circulars and Price Lists free. Address

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Mining Engineer,

Formerly Director of the Bureau of Statistics of the United States; Superintendent of the United States Special Commissioners of Mines; Member of the Committee on Mines at the Congress of Nations held in St. Petersburg, Russia; Mining Commissioner for the United States Monetary Commission; author of a History of the Precious Metals, etc.

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Mining properties surveyed and reported upon; assays and quantitative analyses made of ores, etc.

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PACIFIC REDUCTION WORKS,

Melrose, Alameda Co., Cal.

P. O. address, room 49, Merchants' Exchange, S. F.

GOLD SULPHURETS and SILVER ORES Purchased. Custom work done. Chemistry, Assaying and Hydro-Metallurgy taught on Reasonable Terms.

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The Archer Patent Invalid Bed.

By simple mechanical attachments the bed may be elevated, tilted, or adjusted to accommodate the invalid.
For full particulars see MINING AND SCIENTIFIC PRESS December 27th, 1879.
The adjustable bed bottom is put on top of the mattress, and by means of noiselessly operating cords and pulleys the patient may be put in any desired position.
The bed is adapted for persons in good health who wish an easy position, as well as it is for invalids.
This bed is of the latest improved form, with a view to simplicity, convenience and ease to the occupant.
A limited number of State and County Rights for sale.
Orders for the Patent Bed can be filled immediately.
Satisfaction will be given to those desiring to interest themselves in the manufacture or sale of this article.

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Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

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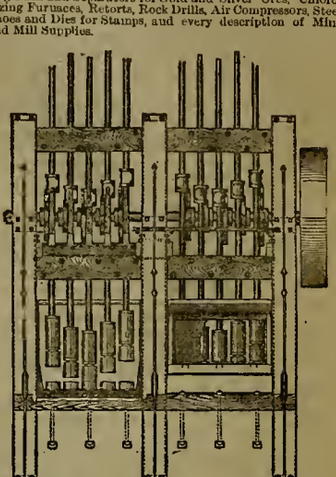
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chlorodizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



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Wrought-Iron Frame

FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.
We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,550.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

MOREY & SPERRY,

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Important to Mine Owners and Cities.

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Dodge Rock Breaker

CHALLENGES THE WORLD

To produce as good a machine. Sold at one-half the price of others, and guaranteed not to break.
Rock Breaker and Cornish Rolls Combined.
Rock Breaker and Pulverizer combined in one machine for pulverizing very fine.
Furnaces for chloridizing and desulphurizing ores.
Concentrating Jigs and Slime Machines for concentrating

Gold, Silver, Lead and Copper Ores.

Amalgamators, and plans for working ores by the various processes. Address

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Care of Prescott, Scott & Co., San Francisco.

A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Hueme, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. O. Hoagland, S. & J. Newsom, B. Henrickson.

Diamond Drill Co.

The undersigned, owners of LESOHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

A. J. SEVERANCE & CO.
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CHAS. E. KELLY,

Attorney-at-Law,

Notary Public and Commissioner of Deeds

209 Sansome St., Bet. California and Pine, S. F.

Connection in every town in the State for collection of debts.

CONTINUED FROM PAGE 293.

PLACER GOLD.—*Arizona Miner*, May 1: Calvin Jackson has sent in another lot of gold dust from his Lynx creek hydraulic diggings, the result of 21 days' run, amounting to $1,800. With plenty of water the year round with which to work these diggings, they would be the most valuable property, by far, in Arizona. As it is they are a pretty good thing to have. Charles E. Bowen is in from Bradshaw and tells us that the Bisin mill will start up next week on ore from the Tiptop district, which is now being packed to the mill.

OREGON.

GRAVEL MINES.—*Bedrock Democrat*, April 28: The Placer gold mining company, of Oregon, incorporated in Ohicago, owners of extensive and valuable mines on Clark's creek, in this county, is now putting up large hydraulic pipes and "Little Giants," preparatory for summer work, and when completed will rank No. 1 for capacity and moderu improvements in gravel mining. These mines have been thoroughly prospected and when fully developed will satisfy the most skeptic investor that no other industry pays so large a profit for the risk and outlay as a good gravel mine. Powers & Co., of Rye Valley, are in full blast, running two large pipes, and with flattering results, on their hill claims. When the creek or flume ground belonging to the same company is opened, much larger returns are anticipated. We predict, at no distaut day, that gravel mining in this section will equal any on the coast.

RICH STRIKE.—One of the richest discoveries in quartz in this county was made last Friday near Pocahontas, ab ut 8 miles from this city, and about 300 yards above the well-known Baisley placer mining claims, by Messrs. H. H. Hayes, J. H. Cavanas and J. M. Luport. The ledge has been named the Tom Payne, and is under the supervision of Mr. George L. Hayes. The ledge averages from 3 inches to 3 ft in width, at a depth of 12 ft, and the rock ie the richest we have ever seen, assaying from $200 to $4,000 per ton. At present there is no mill or even an arastra on the claim, but one man with a hand mortar has pounded out as high as $238. The gold is from 871 to 879 fine. The owners of this lode intend to put up a good arastra at an early day.

CHICKEN CREEK.—I write you a few lines from this mining camp. No water in the ditch yet. Weather cold and stormy. The ditch company have some 35 men on the ditch clearing out and enlarging it, and will have water running in a short time. Miners of this camp think it will be a lively camp this summer, as they will have more water this year than they have ever had since the camp has been struck. There is more snow in the mountains here at this time than has been for ten years. The quartz mines are paying well; there have been some new discoveries made, and the richest rock that has been found in this part of the country. The owners of these new mines are at work taking out rock, and ere long you will here of some huge clean-ups being made. There are about 60 white men in this camp, and about 30 Chinamen. The mines on Burnt river prospect well. Messrs. Farnsworth and Sisley have their 4 miles of ditch completed, and will be ready for work in a few days. Mr. Charles Green is still prospecting his mine and getting good returns. Brooks & Woods have been running their 5-stamp mill on rock out of their mine on Gold Hill, which pays well.

News in Brief.

COPPER ledges have been found at Mohave, Arizona.

PARTIES of Eastern railroad men are visiting New Mexico.

AN intense anti-Chinese feeling prevails at Ottawa, Ontario.

THE decrease of the public debt during April was $12,078,070.

EXTENSIVE coal discoveries are reported from Hay creek, Dakota.

A MINING speculator has made $40,000 in Boulder county this year.

W. H. DOOLITTLE, Associate Commissioner of Patents, has resigned.

SOUTHERN California papers are agitating the project of forming a new State.

FOURTEEN emigrant teams left Chico for Washington Territory last Thursday.

AMERICAN hogs may now be entered in Canada, and slaughtered upon their arrival.

THOMAS A. SCOTT has resigned the Presidency of the Pennsylvania Railroad Company.

IT is thought probable at Washington that Congress will adjourn on the 1st of June.

THE track of the Southern Pacific railroad is now laid thirty-four miles east of Tucson.

THE farmers and gardeners of Salt Lake City are a month behind with their spring work.

A STEAMER is now making regular trips on Frazer river, in British Columbia, as far as Yale.

IT is computed that there is gold ore enough in Bingham, Utah, to run 1,000 stamps 100 years.

FOR a week past Prescott has been persecuted with a Southern Arizona wind—acrid, arsenic and alkalic.

PREPARATIONS are being made to celebrate the Queen's birthday at New Westminster and at Victoria.

THE Parrot City Gold company has sent to New York for a four-mule load of arms and ammunition. The Utes must go.

A CALCUTTA dispatch says that the Maharajah of Cashmere is suspected of carrying on a secret correspondence with Russia.

A LARGE portion of Sierra valley is covered with water under the snow, which makes traveling extremely disagreeable.

IN Rico flour is $30 per hundred, coffee 65 cents, and sugar 65 cents per pound. Whisky that will kill one mile, 25 cents per drink.

A BRANCH road will be constructed to Silvertou from the junction of the Denver and Rio Grande railway at Animas City. Ditto to Rico.

The *Idahoan* says: Large numbers of men are camped on the overland road, waiting for the roads to improve, so they can go to Wood river, Idaho.

ANDY MILLSAP, of Grindstone, Colusa county, has killed three panthers and one bear this winter, but the panthers killed about sixty sheep for him.

MAYOR KALLOCH has been impeached by the San Francisco Board of Supervisors, and legal proceedings are to be instituted for his removal from office.

THE population of Spokane Falls, Washington Territory, is about 400, and is rapidly increasing. Lots are worth from $270 to $800, according to location.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING APRIL 27TH, 1880.

226,824.—CAR COUPLING—E. T. Barlow, S. F.

226,901.—MACHINE FOR MAKING METALLIC LATHS—C. H. Carter, S. F.

226 909.—WASHING MACHINE—J. Frellocher and F. Mahler, S. F.

227,022.—PUSSA FASTENER—N. C. Larsen, Sacramento, Cal.

226,918.—AIR COMPRESSOR—L. B. Lawrence and W. P. Hammond, Oakland, Cal., and A. G. Strawbridge, Sbaron, Pa.

9,173.—EXPLOSIVE COMPOUND.—A. Monnier, S. F., (reissue)

227,038.—AUTOMATIC COIN-COUNTING DEVICE—W. C. Morrison, S. F.

227,049.—DOUBLE-TREE—J. J. H. Parrot, Salem, Ogn.

226,933.—PREPARATION FOR COATING INGOT-MOLDS—A. L. Limodi, Silver City, Idaho.

227,065.—WATER WHEEL—W. Sims, Stayton, Ogn.

226,392.—FORMING LINK—S. Ureu, Sacramento, Cal.

226,881.—CAR BRAKE—C. W. Richardsou, E. and J. E. Dawson, Red Bluff, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Resources of Arizona.

In another column we give the second of a series of articles on Arizona, which have been compiled for the PRESS in order to give our readers as full and reliable information concerning that growing Territory as is at present attainable. As we have had to use the testimony of other writers, we can only say we have sought to give our readers the best at command. We intend soon to send a special correspondent to this new and important field, and to furnish every detail concerning the different mining districts and the material resources of the Territory which it is possible to procure. Our correspondent will visit the principal mining fields in Arizona and collect such statistics and details as are available. What we now give is somewhat general in its character. So great an interest is manifested in all that relates to the Territory, and especially its mining resources, that we shall spare no trouble to gather and publish such information concerning it as will be of value to our readers.

Various Causes—

Advancing years, care, sickness, disappointment, and hereditary predisposition—all operate to turn the hair gray, and either of them inclines it to shed prematurely. AYER'S HAIR VIGOR will restore faded or gray, light or red hair to a rich brown or deep black, as may be desired. It softens and cleanses the scalp, giving it a healthy action. It removes and cures dandruff and humors. By its use failing hair is checked, and a new growth will be produced in all cases where the follicles are not destroyed or the glands decayed. Its effects are beautifully shown on brashy, weak, or sickly hair, on which a few applications will produce the gloss and freshness of youth. Harmless and sure in its operation, it is incomparable as a dressing, and is especially valued for the soft luster and richness of tone it imparts. It contains neither oil nor dye, and will not soil or color white cambric; yet it lasts long on the hair, and keeps it fresh and vigorous.

FOR SALE BY ALL DEALERS.

Organs and Pianos.

The Hon. Daniel F. Beatty, of Washington, New Jersey, comes to the front with what we consider the greatest offer ever made on first-class Pianos and Organs. The celebrated instruments of his manufacture have attained a world-wide celebrity for purity of tone, excellency of workmanship and every quality that can make instruments *desirable and durable*. A fairer or more liberal offer was never made, for, if in any particular the description of instrument differs from the advertisement, Mayor Beatty will take it back and pay all freight charges both ways. As an evidence of his immense popularity among those who know him best, we mention the fact of his re-election lately as Mayor of his city by an overwhelming majority. Any one contemplating the purchase of an Organ or Piano should send for his latest illustrated circular, which is complete in every detail. Read his advertisement.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Chew JACKSON'S BEST Sweet Navy Tobacco.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 29th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Secy.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, May 21st, 1880, and day of sale to Wednesday, June 23d, 1880. By order of the Board of Directors A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

Palmer Ice and Refrigerating Company.—Location of principal place of business, San Francisco, California. Location of works, 224 Fremont street, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of April, 1880, an assessment (No. 2) of $5 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 303 Montgomery street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the 24th day of May, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 17th day of June, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. C. O. PALMER, Secretary.

Office—No. 303 Montgomery St., San Francisco, Cal.

ANNUAL MEETING.

OFFICE OF THE

Pioneer Consolidated Mining Company,

A meeting of the stockholders of the Pioneer Consolidated Mining Company for the election of a Board of Trustees to serve for the ensuing year and for the transaction of such other business as may come before the meeting, will be held on MONDAY, the Twenty-Fourth day of May, 1880, at 2 o'clock P. M., of that day, at the office of the Company, Room 4, 309 California street, San Francisco California. Transfer books will be closed on Friday, the Twenty-First day of May, 1880, at 3 o'clock P. M. J. M. BUFFINGTON, Secretary.

Office—Room 4, 309 California street, San Francisco California.

ANNUAL MEETING.

The Annual Meeting of the stockholders of the Original Gold Hill Gold & Silver Mining Company, for the election of a Board of Trustees to serve for the ensuing year and, also, for the transaction of such other business as may properly come before it, will be held on Monday, the Tenth (10th) day of May, 1880, at the hour of 2 P. M., at the office of the Company, Room 4, 309 California street, San Francisco, California. Transfer books closed on Friday, the Thirtiotb (30th) day of April, 1880.

J. M. BUFFINGTON, Secretary.

Office, Room 4, 309 California, St., San Francisoc, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

San Francisco, May 1st, 1880.

At a meeting of the Board of Directors of the above named Company held this day,

Dividend No. 15 of Seventy-five Cents (75c)

Per share was declared, payable on Wednesday, May 12th, 1880, at the office in this city or at the Agency of the Nevada Bank of San Francisco in New York.

WM. WILLIS, Secretary.

Office—Room No. 29, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

Improved Grounds For Sale

NEAR SAN JOSE.

The subscriber offers for sale a tract of land, 40 acres in extent, located half a mile south of the road from San Jose to Alum Rock, and four miles from San Jose—directly in the warm belt of the foothills. The grounds are pleasantly and conveniently located, and under a high state of cultivation.

Five Acres in Orchard,

— CONSISTING OF —

Orange, Lemon and Lime Trees, Nuts, FIGS, ETC.,

Together with a great variety of other Fruits, large and small, and GRAPES. TWO ACRES are set off for an

ORNAMENTAL GARDEN,

Which is now filled with Shrubs, Flowers and a fine growth of ORNAMENTAL TREES, 170 in number, now 11 years old. In connection with these grounds there is now a

Small Cottage and Farm House,

Well built and hard finished. On the higher ground there is a

FISH POND,

40 by 80 feet in extent, and 8 feet deep, well stocked with Carp. The pond is supplied with water from a never-failing spring a few feet distant, which delivers 24,000 gallons of water every 24 hours the year round. The pond is at an elevation of 20 feet above the house, and from it pipes are laid for irrigating the orchard and garden, and supplying the house.

Forty-three acres additional will be sold if desired, making a total of 83 acres.

This place affords a rare opportunity for anyone desirous of securing a well improved locality for an elegant country residence, and will be sold at a great bargain. For further information apply either at this office or of the proprietor on the premises.

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Our New Automatic Engine.

First—The Corliss Engine cannot, as a rule, take steam beyond two-fifths the stroke—unless it takes it all the way.

We can take five-eighths or three-quarters, or even more, if needed, and at the same time work down to one-tenth or one-twelfth, and get a good engine port

Second—The Corliss cannot, without sacrificing some of this two-fifths and reducing its range of governing to a minimum, give any exhaust lead or cushion. The consequence of this is that Corliss Engines of almost every builder thump badly, and also need to be much larger than is absolutely required, so as to be ready for emergencies. It is plain that an engine that can give only two-fifths of a stroke cut-off is not to be relied on for sharp work under heavy change of load and must have a heavy fly-wheel to steady it.

We can give just what we need. Our New Automatic has trunk frame like the Corliss, but has rotary valves, both at bottom of the cylinder like the Wheelock. This is to save clearance. The valves are operated by cam motion, thus giving the most perfect opening and closing known. The valve opens full width and no further, and shuts just enough for safety. This saves wear and tear of reciprocating parts. Two eccentrics operate valve gear—one fixed, giving an invariable point of opening the steam and exhaust and closing the exhaust. The movable eccentric controlled by a rotary governor fixed on main shaft, where it can never get away, controls the closing, the valve being alternately controlled by the two eccentrics. No dash-pots nor noise, and the most exquisite adjustment.

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Size—Quarts....	½	1	2	4	6	8	12	16
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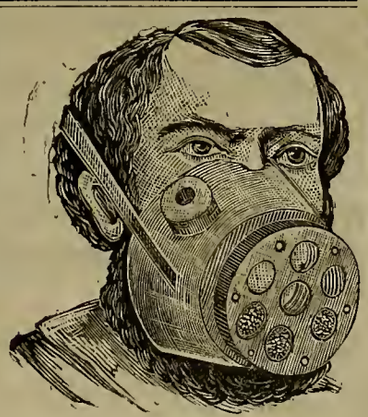

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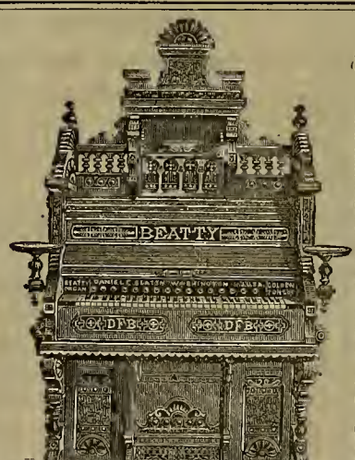

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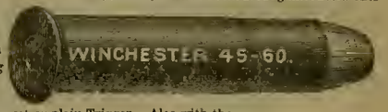

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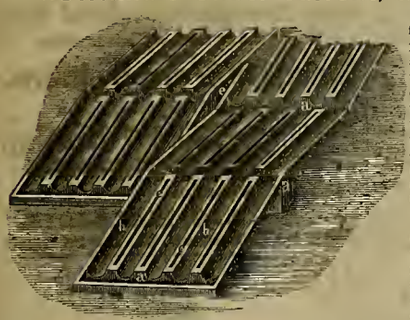

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In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

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The Pulverizer requires about one-third the power usually expended for the reduction of the same amount of Ore by Stamps.

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1	6	56	600	40	12	6,000 ft.	$5,000
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The Repairs on the Pulverizer will not exceed those of a 10-Stamp Battery.

The Shipping Weight of the entire apparatus is not one-eighth of that of Stamp-Mortars required to do an equal amount of work. It can be placed and put running at the Mill in from fifteen to twenty days.

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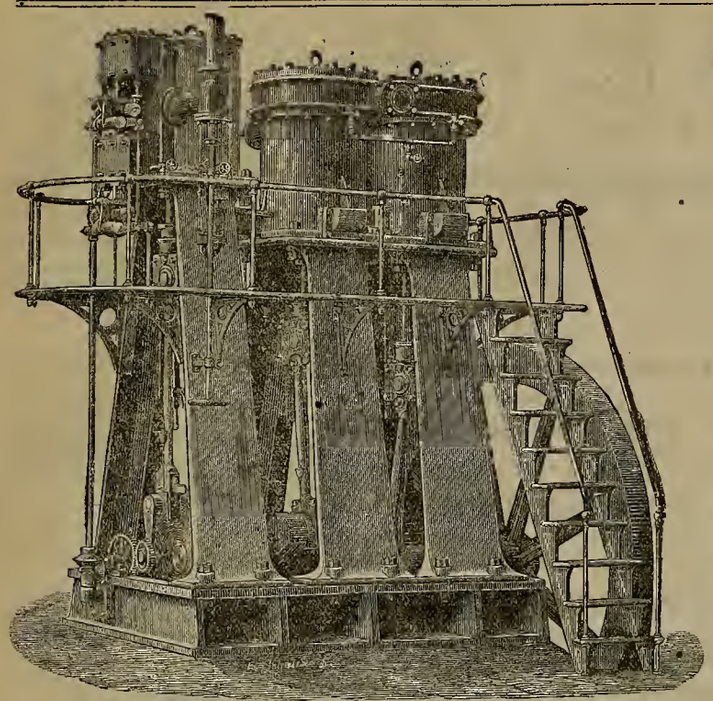

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DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

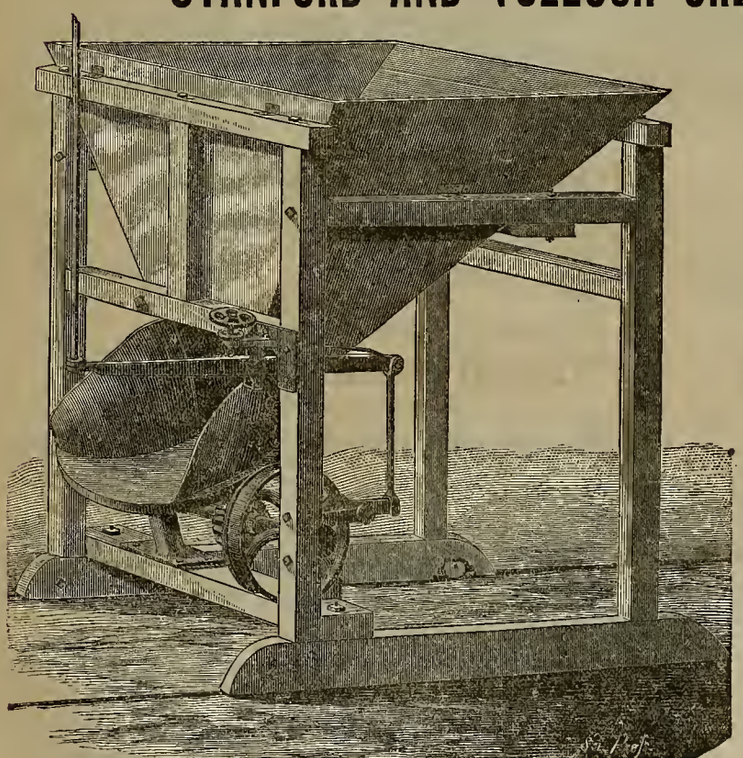
Small Sizes made in Sections not to Exceed 300 lbs.

The $1,000 Challenge Ore Feeder

AT REDUCED RATES.

—ALSO THE—

STANFORD AND TULLOCH ORE FEEDERS.



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CHALLENGE ORE FEEDERS,

Are in use in many mills on this coast, and wherever used give great satisfaction.

The STANFORD Feeder, made by me, has superseded the Victor Ore Feeders, furnished by E. T. Steen, in the Alexander mill, J. B. Cooper, President, office, Safe Deposit Building, S. F. By special permission I am enabled to refer interested parties to Mr Cooper.

In this connection I will state that I will give $50 to be shown up to this date one of the Eclipse Ore Feeders, manufactured by Prescott, Scott & Co., of the Union Iron Works, which is in general successful practical operation at any quartz mill on this coast.

I have made a specialty of manufacturing ORE FEEDERS, and know which will give satisfaction for steady work. The Improved

STANFORD FEEDER

Will beat any one in use—always excepting the CHALLENGE, which is THE BEST OF ALL.

By use of CHALLENGE ORE FEEDER there is 15 per cent. less wear and tear of iron than by hand feeding. There is also 20 per cent. more ore crushed.

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The Challenge

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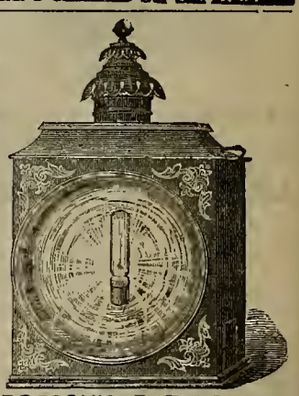

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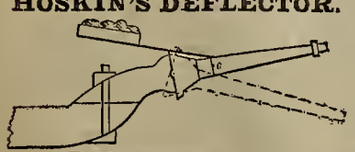

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 15, 1880.

VOLUME XL. Number 20.

Mines of Amador County.

We have been shown a recent report, by Mr. Wm. Rose, on the Providence Con. mine, situated near Volcano, Amador county, which contains some interesting facts concerning also other mines and the general characteristics of the district. The Providence Con. embraces the old Rose and Providence claims; the former being a relocation of the Siebenthaler mine, covering 20.10 acres, which was worked in 1860-62. The latter location was made subsequently by Mr. Rose. The ground is situated near the upper end of Dry creek, among the foothills of the Sierra Nevada, at an approximate altitude of 2,700 feet above the sea level. The distance to the railroad station at Ione City is 23½ miles, and to Latrobe 22 miles. The towns of Volcano and Oleta are in the immediate vicinity of the district, and the travel from San Francisco is stated at 14 hours.

Amador county lies between the Cosumnes river on the north and the Mokelumne on the south. These streams rise within a short distance of each other, and, where they cross the Downs lode, in the lower portion of the county, are about 14 miles apart. In this section extensive quartz operations have been undertaken; especially since 1878. The climate is mild and equable, admitting of mining and milling being prosecuted throughout the year. Placer mining has also been carried on in the neighborhood, yielding, it is said, $7,000,000 between the years 1849 and 1860.

Among the quartz mines, Mr. Rose cites the case of the Downs mine, which had been abandoned from 1861 till 1878, when it was relocated; it is said that the expenditure of $6,000 led to a net monthly output of $16,000. Another abandoned mine, the Golden Gate, owned in New York, has also been made a paying property. These examples, Mr. Rose thinks, will lead others to recommence work, and that the district will be as important, as a quartz mining country, as it has been as a placer region.

The Downs lode is a quartz belt running in a north and south course through the center of Amador county. On this belt a large number of locations have been made, among them the mines mentioned in the report. The croppings of the lode are in line with those of the great quartz veins of Mariposa, Tuolumne and Calaveras counties on the south and El Dorado county on the north. The lode is not a continuous bed of quartz, but rather a series of nearly parallel detached veins and irregular masses, with barren intervals between them. There are occasional deflections, but the general course is as stated above. The lode near the surface has a general dip to the east of 45° to 72°, gradually becoming more vertical as depth is attained. In thickness it varies from five to fifty feet, sometimes expanding still wider, but in such cases filled with fragmentary slate and broken quartz.

The principal formation in Amador county is the slate, with occasionally limestone and soapstone. The quartz ledges in slate have marked walls and carry a well-defined gouge of clay which facilitates the extraction of ore. In the case of the Downs lode the western or foot-wall is a black slate, and the eastern or hanging wall a metamorphic rock—greenstone. It is claimed by Mr. Rose that with the present facilities for crushing, low-grade ores can be profitably handled. According to official report there are now 680 stamps in operation in the county.

FOREST fires are still raging in Pennsylvania.

Cable Grips.

The suit of the Traction Railroad Company vs. the Sutter Street Railroad Company has been on trial for the past two weeks in the United State Circuit Court. This suit has excited considerable attention, especially from those interested in street railroads, as it involved the use of a dummy in combination with a grip working in an underground tube, a traveling rope and a car, being Patent No. 112,663, granted to A. S. Hallidie, September 26, 1876, and assigned by him to the Traction Railroad Company. This device is in use by all the cable roads in this city.

During the course of the trial the history of the invention of the cable roads was clearly set forth, and Mr. A. S. Hallidie's priority of invention proven. It was shown that he had originally conceived the idea, and made the first experiments on the application of iron rope to the transportation of passengers over the steep hills. After some difficulty in raising subscriptions, a company was formed, and in Sept., 1873 the Clay Street Hill road began operations.

In the meanwhile numerous patents had been granted to Mr. Hallidie for his various inventions, and on March 24, 1876, he applied for the patent involved in the suit, viz, the dummy. It was claimed by the defendants (Sutter Street Railroad Co.) that the right to the patent was forfeited, more than the two years allowed by law having elapsed since the "dummy" had been in public use. The evidence showed, and the Court ruled that it was only in experimental use, and that the two years limitation could not run against a machine not perfected sufficiently to work successfully. The defense also claimed that the elements of the combination were old. The Court ruled, and it was not denied that the combination produced a new and useful result, and the jury was instructed that such a combination was patentable.

It was shown in the evidence that the Sutter Street Railroad Company visited the Clay Street Railroad works repeatedly for the purpose of learning how things worked, and that they afterwards used the devices operated by the Clay Street railroad; that in June, 1876, the Sutter Street Company obtained a franchise to use wire rope on Sutter street, and that in January, 1877, they first put their cable road in operation, and have continued since to operate a road worked in part by horses and in part by wire rope. On the question of damages there was considerable dispute, and the jury assessed them at $1, finding for the plaintiff on all points relating to the patent, and sustaining its validity. It appears from the decision that Mr. Hallidie is entitled to the honor and profits of the invention, which, by the way, was patented through the MINING AND SCIENTIFIC PRESS Patent Agency.

The Mining Law.

In our last issue we presented the substitute for the Public Land Commission's Mining bill, which had been prepared by the Congressmen from the Pacific coast, and is to be introduced in the House as soon as practicable. Section 2322 of chapter six of the Revised Statutes is to be amended by adding: "And in all cases where the mean dip of the lode does not exceed 25 degrees from the horizon the right to follow the mineral shall not extend beyond the side lines of the location drawn downward vertically, on any mineral land where there is no outcrop of a vein or lode on the surface of the ground."

The House Mining Committee this week adopted the bill as agreed upon by the Pacific coast delegation. Representative Belford was authorized to report it for passage, by a practically unanimous vote of the committee, Warner, of Ohio, being the only member present who refused his concurrence. He took the ground that the passage of this bill will have the effect of preventing action on any other branch of the Public Land Commission's Mining bill, and he is doubtless correct in this view, it being, in fact, the intention of the framers of the measure to regard it as a substitute for the whole of the recommendations made by that commission in regard to mineral lands and mining laws.

Meetings of miners still continue to be held to protest against the original amendments offered, and it is not likely they will ever pass. Those referred to above are intended to take the place of the whole bill as offered by the Public Land Commission.

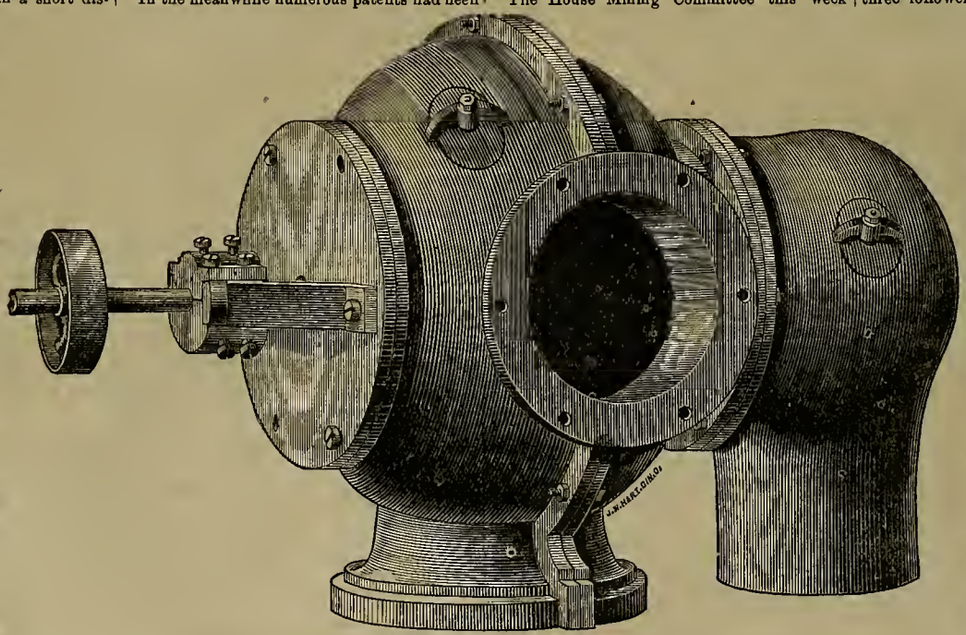
THE Comstocks are lower, in the aggregate, at the present time than they were during the great depression of 1877. On Tuesday last their value was about $13,000,000, while in 1877 the bonanza mines alone were selling at the rate of $15,000,000.

U. S. TROOPS have been sent to Indian Territory to drive out settlers.

Myers' Horizontal Flume.

This new and useful method of using turbine water wheels we illustrate to-day. Many of the quartz mills and saw mills on this coast have this case in use, and it has given universal satisfaction. It consists of two semi-spheres flattened at their sides, so as to give the largest space for water to pass opposite to the buckets of the turbine, or where the water is admitted to the wheel.

It is made usually of cast iron, and strong enough to stand the pressure of 100 feet or more. The shaft of the wheel passes through a stuffing box, and a journal as well as the stuffing box receives the lateral pressure or draft of the belt. This stuffing box is lubricated with water from within. The bottom of the shaft is sustained by a step and journal within the draft tube. The step resists the downward pressure of the water while the journal carries the weight of the wheel, and is so arranged with three followers of wood that where they wear they can be set up with set screws; this journal is lubricated with water. There is so little weight and wear on this journal that it lasts for years without repairs.



MYERS' HORIZONTAL FLUME.

This device was patented by A. Myers, in 1873, and was first used in the Eureka mill, on the Carson river, Nevada, with a 52-inch Leffel wheel under a head of 38 feet, developing 444 horse-power.

It was next used at the Empire mill, at Plymouth, Amador county, Cal., under 78 feet head, where a 20-inch Leffel wheel drives an 80-stamp quartz mill and other machinery. Then, shortly after, it was used at Truckee, Nev., under 125 feet head at the Lonkee & Smith saw mill, where a 15-inch wheel develops 150 horse-power, and they have sawed 123,380 feet of lumber in 24 hours consecutive running. Since then it has been used in scores of other mills, and in every instance it is a success, and in all the mills is working to-day as satisfactorily as at first.

The patent was issued to A. Myers in 1873, and he is the only manufacturer at present. They are made in this city at the Ætna Iron Works. Any further information will be cheerfully answered by the inventor, who, also, is the only manufacturer of the celebrated Leffel turbine on the Pacific coast.

RIVER AND HARBOR APPROPRIATION BILL.—The following items are in the river and harbor appropriation bill reported to the House of Representatives: Constructing a canal around the Cascades of the Columbia river, $100,000; Upper Columbia and Snake rivers, $15,000; Upper Willemette river, $2,000; Lower Willemette and Columbia rivers, from Portland, Oregon, to the sea, $45,000; Oakland harbor, California, $60,000; Sacramento river, $30,000; San Joaquin river, $15,000; Skagit river, Washington Territory, $2,500; Petaluma creek, California, $8,000; Cowlitz river, Washington Territory, $2,000; Chehalis river, Washington Territory, $5,000; Yequina bay, Oregon, $40,000; Coquille river, Oregon, $10,000.

SERIOUS trouble is anticipated in the coal mining districts of St. Clair county, Mo. A combination has been formed by the Miners' Union to close all the mines simultaneously until the differences may be settled.

LANGLEY'S Directory for 1880 which has just been issued, contains 109,540 names, being a small increase over the number contained in the Directory for 1879.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Late Rain Storms.—Modes of Measuring.

Editors Press:—The unprecedented storms of the first three weeks in April, through the northern and central portions of California, have brought to this portion of San Joaquin valley its share of the heavy rains. The entire rainfall at Hanford for April, which ended at 5 P. M. of the 22d, was 3.53 inches, making for the season 12.34. Ths season's rainfall at Visalia varies hut little from this. We have not learned here the amount which fell the 22d; but on the 21st the relative amount shown by the gauges at sach point was: Visalia, 12.05 inchss; Hanford, 12.14. It may be of interest for your numerous readers to compare rains, including the 21st of April, at the following points: Merced, 10.99; Modesto, 12.10; Stockton, 14.12; Sacramento, 25.25; Woodland, 15.93; Marysville, 17.45; Colusa, 17.90; Hollister, 12.34; Salinas, 12.50; Pleasanton, 19.50; Oakland, 22.35; San Francisco, 25.31; and for our higher regions: Healdsburg, 54.74; Auburn, 36.47; Nevada City, 57.52; Shasta, 63; Georgetown, El Dorado county, 63 inches. Bearing these figures in mind, together with the fact that the rains for various points named,

For the First Three Weeks of April

Alone, has ranged from 2.50 to 18 inches, and we can realize what a peculiarly wet season this has been for California. To our friends East it will prove that it *does* rain here sometimes.

It is worthy of record in the Rural that the gauge used for measuring rains at Hanford is one of those ordered made by the State Engineer's Department, to learn the rainfall at various statione established by the State Irrigation Survey. Major A. G. Warfield, Assistant Engineer, left it here as a ceutral point for the Mussel Slough district, in February, '79. It is well placed—ahout six feet above the ground, free from buildings and other screens. Its measurements have been carefully and regularly observed and recorded.

Near Borden, Fresno county, the rain to April 16th was 9.14 inches, as measured by a hrass cylinder gauge manufactured by James Green, of New York. The amount there since we have not learned.

Coneiderable Surpriee

Has been expressed locally by those aware of the fact that a railroad rain gauge at the Lemoore depot, nine milee west of here, ehould show considerably less rain each month and for the season than the State Engineer's gauge at Hanford. To illustrate: The rain record this season at Hanford, for differcnt months, is: 1879, October, 0.93; November, 0.94; Decemher, 2.43; 1880, January, 1.09; February 3.45; March, 0.47; total through April 16th, 11.47 inches. Here the snow of January 28th was measured as rain, heing allowed to melt in the gauge, as was best. At Lemoore, the same snow is recorded as snow 1¼ inches deep. Now, the usual rule is, that 10 inches of snow, as it first falls, equals 1 inch of rain. Consequently, to reduce this 1.25 inch of snow to the rain standard, it shonld be called 0.12½ or say 0.13 of an inch. For January at Lemoore, this shonld be added to the rainfall recorded there, 0.43, and it makee the rain for January there 0.56. With this necessary explanation and correction, we give now the corresponding rain record at Lemoore: 1879, October, 0.42; November, 0.56; December, 1.40; 1880, January, 0.56; February, 2.67; March, 0.46; total through April 16th to 5 P. M., 8.10 inches. Now, Lemoore ie nine miles

Nearer the Coast Range

Than Hanford, and it is well known that as you go nearer the Coast range in this valley, the rainfall diminishes. But this variation of 3.37 inches is too great to be accounted for by local differences only. So yonr correspondent, who has studied and enjoyed the handling of different kinds of rain gauges for 25 years, eet to work to learn, if poesible, the cause of this difference. For, it is very importaut, not only for the rain record here and in other parte of the Pacific coast, that any error of measurement, if such existed, should he made known, but for the general intereets of scientific accuraoy in euch questions of meteorology, and to secure for such measnrements a proper confidence. What follows is not for fault finding, but to seek the truth. It gives me pleasure to inform your readers, that

The Cause of Such Difference

Has been detected with certainty in the mode of measuring, and that the railroad agent at Lemoore, Mr. James Dickson, a very clever young gentleman—who, I doubt not, had measured and recorded the rain there carefully, according to hie instructions—kindly gave me every facility for learning the amounts recorded there and tho mode of measurement. Results are as follows: The gauge used is the brass cylinder; inner diameter of upper part about two and one-half inches, lower part about one-half inch. For measurement, the instrument maker has prepared a metal rod, graduated into tenths aud hundredths of an inch. This is to be thrust down to bottom of the small tube of the gauge, and according to the hight to which the rain water risee and wets the rod, you read of so many hundredths, etc., as the amount of rain. Of course the maker has had to calculats accuratsly just

How Much Water is Dieplaced

By this rod, when it is placed in the tube, so that it may accurately show the rainfall.

Now, it so happens that water does not adhere well to a metal rod. But this trouble is easily overcoms, hy breathing upon ths rod or placing on it the dust of flour or dry sand just before inssrting it into the cylinder. To ohviate this difficulty, a small wooden rod—walnnt—has besn sent the agent from the company's office at Sacramento. This he dips into the tube, the watsr readily marks upon it the point to which it risss. Wet in this way, it is laid side hy side with the graduated part of the metal rod, and from the latter the parts of an inch are read off.

Here Comee in the Error.

The wooden rod is just about half the volume of ths metal. Hence it does not displace as much water, the latter does not rise as high around it, so that it does not show as much rain as if the metal rod were placed in the tnbs.

The important question is, what fraction will express approximately the degres of error thus produced? This is easily ascertained, as was done at once, when Mr. Dixon explained the method used for measurement. A small rain remained in the tubs unmeasured. To prove the error, the metal rod, coated with the vapor of the hreath, was placed in the tuhe. When removed it read 0.06 of an inch. Next the walnut rod was inserted. When removed and placed by the graduated metal rod it showed only 0.04½. Here was the customary mode of reading it. But this was 0.01½ less than to read by the correct method. Now, 1½ is what part of 4½? Exactly one-third. Add that third to 4½ and it gives the correct measurement—0.06.

Consequently, all measurements by the woodcn rod half the size of the metal rod should be

Increaeed by One-third

To give correct results. Of course, a wooden rod just the eize of the metal one would make correct measurements, provided that ite porous character did not allow it to absorb some of the water by capillary attraction.

It follows that 8.10 inches should be increased by one-third to show approximately the proper rainfall at Lemoore to April 16th inclusive. This adds 2.70 inches, making in all 10.80 inches, or only 0.67 of an inch less than fell at Hanford during the same part of the season. Here is

Quite a Satiefactory Reeult.

Let us apply the correction in one other instauce. The heavy rain of 48 hours, ending February 21st, at Hanford was 3.25 inches; at Lemoore, we were surprised to find only 2.25. But add to the latter one-third, or 0.75, and we get 3 inches—ahout the correct amount, no doubt, for Lemoore. In conclusion, it is important to observe, that if the mode of measuring at every railroad etation hae been uniform a corresponding error exists in all their rain records. J. W. A. W.

Globe District.

A correspondent of the Phœnix (Arizona) *Herald* says:

I am etill stopping in this district, and the longer I stay the more I find to interest me, as the mineral is not confined to one or two narrow veins or ledges, but extende for eeveral miles in width, so that something new ie discovered every few days. I find that there ie here eomething that not only surprises but intereste all who take the trouble to investigate some of the property located here.

I have found the greatest variety of ore here, hoth in quantity, quality and character, of any belt I ever visited, so that at the present time I am prepared to believe almost anything I hear in the way of new discoveries. There seems to be a big error in regard to this district regarding our mines and ore hodies, as most who come here have the impression that there ie only emall pockets on the surface, eo at the arrival the inquiry comes, "How deep are you, and how does it look at that depth?" We recommend a personal visit, and then, Yankee-like, ask them how it looks ou the bottom. "Better than on top" is the verdict usually, so that we are satisfied that we have everything that is required to make a good district.

At the Basin, several new prospects have been opened up and are showing good, ae is also the Southwest Alice. This mine was opened hy a shaft 100 feet deep, and pronounced by all to be a fine property. Still recent improvements by drifting is placing it on the list that contains the best.

The South Silver Nugget is improving rapidly and is destined to be among the first in the ranke as a producer of bullion.

The etrike in the Borel continues to hold out, and it wouldn't be surprising if that, in a ehort time, it would justify the building a mill; in fact, it ie difficult to find any improvement going on but what is showing satisfactory returns, so that at the present time everyone is elated and happy, ehowing that the "hoom" has finally etruck Globe.

The Highest Mine.—The higheet mino in the United States, and probahly in the world, is the Present Help, on Mount Lincoln, in the main range of the Rocky Mountains, Park county, Colorado. Mount Lincoln has an altitude of 14,297 feet. The present Help boarding house, huilt alongeide of the main drift, is ahout two hundred yards away from the eummit of the mountain, and 140 feet lower down. This leaves it 14,157 feet above the sea level.

Quartz Mining in Tuolumne Co.

The following itsms of iuterest are condensed from the *Tuolumne Independent*. Soulsbyville is strictly a quartz mining camp, yet only two or three of the numher of mines noticed here may he said to bs fully dsveloped, and hut one of the numhsr to any extent. The claims hereiu noticed are located in differsnt lodes. Commencing with the Leechman & Co's claim on the main or fissurs vein, discoversd in the early history of this district. It first gained notoriety in 1860 when Mr. Soulsby the pionser quartz miner of the district commenced to develop its immense wealth. The property came into the hands of the present company [Leechman & Co] in 1872, when operations were commsnced on a larger scale, a new mill was put up, the south shaft reopsned, and improvements made, costing, on an aggregate, $300,000. Nsw houses sprang up in every direction, until soon the camp contained a population greater than svsr hefore. But, once more it hsgan to show symptoms of decay, and ths new year of 1880 found her again idle.

At present an air of quietness psrvades the placs. A few men are picking ths dumps, but the mins is idle. Mr. Lsechman, the Supsrintendent, it is understood, is in Nsw York trying to dispose of the mine; and, if he is successful, hopee are entertained of his speedily going to work again. The wealth taken from this mine has heen felt directly and indirectly throughout the entire county: Directly, hy its consumption of wood and the produce of our farms, and hy the accumulated savings of many heing invested in and developing agricultnre near by. Other mines in the camp, involving the Independent, Platt and Raymond claims, have been worked from time to time. A mill on the Raymond, and other expensive machinery, have been used on it and the Platte mine. Sulphuret works of various descriptione, and a custom mill and arrastras, are usually working there; hnt all, as if in eympathy with the mother mine that gave them hirth, are idle. Preparations were made, a short time since, to work the Platt mine, but from some cause or other, it has not started yet. That a company may he found to work euch a good mine as the Soulsby, has proved itself to be, is the sincere desiro of all those that know and appreciate the benefit that it confers on our county when in active operation.

On the Independent mine operations were commenced hy the present company eix weeks ago, and they have already sunk 160 feet on the vein with the most encouraging prospects. Ou the exteusion of this vein are located the

Platt & Raymond Claime.

The former was recently purchased hy a Boeton company, which company contemplate erecting worke for the reduction of ore, etc., aud making a dividend-paying mine. The Raymond is also in progress of development. On parallel vein west, koown as the Churchill vein, are located the Churchill and Whealperrin claims. The proprietore are actively engaged in prospecting their respective claims, each company having sunk 60 feet on the vein with good showings. One mile in a westerly direction is the Draper, owned by Leechman & Co. Thè company purchased from Whitto two yeare ago, and have eince been engaged developing the mine. In yeare past immense sums of money were expended on thie mine for machinery and for making other improvements in view of opening it out; yet, with all, but little was accomplished in the way of developing—or in other words, determining the character and extent of the lode. It ie gratifying to know, however, that now the mine is in the hands of a company having unlimited means.

Barcelona Mine.—The following items are condensed from the *Belmont Courier:* At a dietance of about 1,000 feet from the mouth of the tunnel there is found a true fissure vein with well-defined walls—porphyry on the foot and slate on the hanging—the vein averages five feet in width as far as explored, viz., 50 feet in the south, and 40 feet in the north in the levels from the main tunnel, the whole distance showing a superior quality of rich sulphurets and bromide of silver. This ore is not in spots, but equally disseminated throughout the vein, and is at a depth of 470 feet on the dip of the ledge from the surface croppings. Thie strike is on the South Barcelona mine, over 600 feet south of the north line of said claim. It is believed that this body of ore will continue north through the old consolidated works, which at a depth of 180 feet from the surface in the incline has a 14-foot ledge of rich sulphuret ore.

Iron Mountain.—There is in Utah, about 60 milee southeast of Frisco district, a huge mountain of iron. It carries, possihly, the richest iron ore in the United States. The high price of material of every kind, including transportion, has rendered it worthless. Lately some of the parties who sold the great mine at Frisco for a cold million, have turned their attention to Iron Mountain, and a gentlemen from that section informs the *Sentinel* that there is a good prospect that rolling mills will he established. The near approach of the Utah Southern railroad, together with the advance in iron, leads to the helief that these great iron mines may be worked with profit. It may be that the time hae not arrived, but that Iron Mountain will, one day, he the scene of extensive and profitable iron manufacturing operations does not admit of doubt. Jay Gould is said to be interested with those who are now making experiments.—*Eureka Sentinel.*

What Mining Has Done.

"Notwithstanding the fact that mining has, until within a fsw years, never been practically and scientifically worked in California, and now only to a limitsd extent, statistics prove that from the discovery of gold in California until the present time mining has paid 18 per csnt. on the money invested. The proof hscomss all the more conclusive when it is remembered that there is and always has besn a vast amount of precious metal mined of which there nevsr can hs any estimate or record. Mining in California, under all the nnfavorable circumstances nnder which it has labored has not only paid 18 per cent. on the cost, hnt it has peopled and huilt up a mighty Stats upon the western limits of our country, filled cities in the Golden State with industry and prosperity, coversd hsr plains with flocks and her hills with vineyards, and stretched out railroads over the desert and the mountains to unite hsr to the industriss and products of the East. Mining has whitensd the Pacific with the sails of commerce, and made a new nation on the Pacific coast. This must be added to the value of mining, in addition to the mineral products, which alone is no small matter in the prosperity of our country and psople. Ws claim this for mining, because however rapidly the star of empire might take its way westward, it certainly would have yet heen years hefore its light could have reached the coasts of California." The foregoing is from the New York *Mining Review*, one of the ablest conducted mining journals in the world. This is hut a small portion of the great benefits to civilization and the world that are due to the prosecution of mining in California. Hsr hardy pioneers have penetrated to the uttermost parts of the north; have opened up Washington Territory, Oregon and Montana; the yields of precious metals which have astonished the world, and, at no distant day, will eclipse anything they have yet done. California has opened up and developed the great mineral wealth of Nevada, Utah, Arizona and New Mexico, whose mountains now teem with hardy minere, and whose yields of gold and eilver are fast approaching fahulous figures and bid fair to rival California. The mining center of the Pacific coast, whose rich valleys are fast heing brought to a state of agricultural perfection, and dotted with pleasant homes throughout their length and breadth, has made prosperoue States and filled up the tsrritories with pioneere, who, out of their wild domain, have rough-hewn civilization. She has supplied the avenues of trade of the world with a life-giving stream of gold. Her steady yield of the sinews of war carried the nation through the war of the rebellion. The great henefits California has conferred upon the Union and the world cannot be ovorestimated, and yet it is but a tithe of the great and glorious future in store for her.—*Bodie News.*

The Skagit Mines—Nothing in Them.

A correspondent writing from Seattle, Washington Territory, to the Portland *Standard*, saye: Many of the most prominent men here are bitter in their denunciation of the ring who are epreading euch exaggerated reporte broadcast over the country. The merchants have eo little faith in Skagit that they have in no inetance increased their stock of goode in anticipation of a rueh, and are carrying no heavier etock than they did last year. Your correspondent, having interviewed a number of men who have already been to Rnby Creek—eome of them old miners—comes to the following conclusione:

First—That gold has been fonnd in Ruby Creek and adjacent creeks.

Second—That it has in no instance exceeded five cents to the pan unless a pocket wae struck, and that it will not average 2½ cents to the pan.

Third—All the auriferoue region, so far as known, is already taken up and located, and those who are on the road, and also many who are already there, will have to go prospecting.

Fourth—That the route to Rnby Creek is one of great danger and peril, four men having already lost their lives, and eeveral are reported missing; 16 miles of the trail are almost impassable; in placee ropes are requisite to ecale the bluffs and ravines.

Fifth—That the report of so-called Prof. Tiernan is a colossal, exaggerated falsehood.

Several claims have already heen sold, one of 500 feet for the enormous enm of $70, and another of more than 100 feet for $20. There ie little doubt that there is a clique interested in getting up a big rush to Skagit. Their objects are not plainly apparent, unlese they are interested in eome real estate scheme. It is hinted at hy some that it is a political dodge for the purpose of getting the territory admitted to Statehood by adding thousands to the popnlation. My advice to all who have an intention of going to Skagit, is to consider well before they finally make up their minde to do eo, and to swallow all reports in regard to these diggings with a few grains of the salt of incredulity, unless they wish to be participants in another Frazer river horror.

Tuscarora is excited over a strike in the Navajo mine. The *Times-Review* says a epecimen of the oro assayed $1,800 per ton, and it is said that there is a well defined vein of it.

The miners in the Richmond, at Eureka, eay that such an extensive and rich body of ore as is now developed in that mine has never been uncovered in the district.

MECHANICAL PROGRESS.

Riveted Boiler Joints.

Rivets are usually of ¾-inch diameter, and are pitched at a distance of 1¾ inches, center to center. In thicker plates they are generally increased to ⅞ inch, or 15-16 inch; while for marine boilers and ship-plates it is at the same time a matter of opinion, whether, with a proportional pitch, increasing the diameter of a rivet is any advantage. From the results of experiment and practice, ¾-inch and ⅞-inch plates, riveted with ¾-inch rivets at 2-inch pitch, were found to be as strong as entire plates of the same thickness; with thinner plates, a shorter pitch of 1¾ inches, with ¾-inch rivets, or 15-8-inch with 11-16-inch rivets, it is proved that it is not only strength of joint, but tightness of seam, as expressed by Mr. Fairbairn. A great deal has been said and written on the superiority of drilled over punched plates, and machines of a costly type have been constructed for the purpose of drilling boiler and ship-plates; but it can be proved that punched rivet holes, when fairly and truly fitted, are as good as, if not better than drilled holes, for the following reason: As the punched hole is always conical, generally about 1-16 inch to 3-32 inch, when the plates are fitted with the taper or cone of the holes reversed, the rivet hole has the form of a double cone, causing the lines of strain to converge through the plates and thus shortening the leverage, and so far stiffening the joint. It is well known that slightly countersinking the holes, as is done in Messrs. Beyer and Peacock's boilers, improves the joint; and on the same principle, Sir D. Gooch anticipated the twisting of the single-riveted joint, so as to have less liability to distortion under pressure and work.

Long rivets are objectionable, and extra work may be judiciously applied to avoid them. At the junction of the fire-box and the shell at the door long rivets were formerly common, the old way in making the fire-box door being to forge a ring of the length and diameter required, and the thickness of the water space, long rivets being fastened inside and outside the shell of the fire-box through the ring. Mr. Beattie constructs the fire-door with a ring of boiler-plate, which was flanged and riveted to the fire-box, and separately riveted to the shell with angle iron, short rivets being used throughout. Mr. Beattie also forms the junction of the fire-box and combustion chamber of his coal-burning engines, with a ring turned and flanged out of plate with flanges, one of which is riveted to the fire-box, and the other, for want of access to the rivets, being joined and fastened to the combustion chamber. For the same reason, Mr. Hackworth made his junction of the bottom of the fire-box with a piece of boiler-plate doubled, separate riveting being a better arrangement than that made with a solid bar, as was formerly done. This last form of junction is also better for the circulation of water and equalization of expansion.

In the seams of the fire-box, double riveting is detrimental, as the long lap required for the double row is liable to burn and produce unequal expansion, which leads to leaking. On the question of strength, the fire-box is so thoroughly stayed that very little tensile strain is thrown on the joint. Mr. Dewrance found that the ends of the stay-bolts made with square heads, projecting 2½ inches into the fire-box, burned off to a projection of only 1¼ inches, at which point they remained.—*Universal Engineer.*

NEW METHOD OF MAKING BELTS.—A firm in Paris has devised a new method for manufacturing belts or bands for machinery, which is applicable to rubber, leather, woven tissues or gutta-percha, and consists in making the belt with longitudinal ribs or grooves, the main object of which is to increase the capacity of the belt of the same cross-section, say twelve inches, by the extra strength put in the same place, and also to prevent so much stretching and variation. Another modification of the same invention is grooving one side of the belt the same as saw teeth, then putting these two pieces together, leaving a plain bearing surface for contact beside, thus making a double belt which is less liable to stretch or to warp. Especial machinery is built for the purpose, and the claim for it is that better contact is given. The pores are closed during this grooving process, the belts have a higher resisting power, do not twist on the pulleys, the pressure and friction of the grooving process smooths and polishes the surface so that better contact and adherence is had. The grooves may be made regular, irregular, spiral or crossed.

A MILL-OWNER says:—Eelskins make the best possible strings for lacing belts. One lace will outlast any belt, and will stand wear and hard usage where hooks or any other fastening fail. Our mill being on the bank of the river, we keep a net set for eels, which, when wanted, are taken out in the morning and skinned, and the skins are stuck on a smooth board. When dry, we cut them in two strings, making the eelskin, in three hours from the time the fish is taken from the water, travel in a belt.

INCREASED USES FOR GLASS.—Considerable has been written about toughened glass as a material for railway sleepers, and now Mr. Bucknall, of England, intends to manufacture toughened glass pipes for water and gas works, for drains and chemical purposes, as well as transparent bricks, telegraph insulators, etc.

Boiler Explosions in England.

Mr. Fletcher, the chief engineer of the Manchester (England) Steam Users' Association for the Prevention of Steam-Boiler Explosions, has just issued a most excellent and practical report upon this subject, and we find that during the year 1879 there was no fewer than 25 serious boiler explosions, causing the deaths of 40 persons, and injuries to 52 others. Of the above total, 9 explosions seem to have been due to defective condition; 5 to excessive pressure; 4 to malconstruction, coupled with defective condition; 3 to malconstruction, alone; 2 to over-heating through shortness of water; and 1 to caulking under steam pressure. Besides the above there were 22 minor explosions, killing 15 and injuring 36 persons, included in the number being 12 kitchen and circulating boiler explosions—most of which Mr. Fletcher believes might have been prevented by the use of a small reliable safety-valve.

The active causes of these lamentable occurrences—they can scarcely be termed accidents—seem to be 3 in number, namely (1) Faulty construction; (2) absence of regular inspection, and (3) carelessness in usage. On the first head there should be no room for doubt or mistakes in the present state of our mechanical skill and knowledge. The second requirement should be, by legal enactment, made compulsory. The third want is one which no legislation can meet, but it is worthy of notice, that of the 25 principal explosions last year only 2 were traced to over-heating through shortness of water, so that this cause may be considered the least important of the trio, apart from which it is obvious that considerations of personal safety will always tend to keep this risk within due limits. Mr. Fletcher remarks, "the causes of boiler explosions are really very simple," and we cordially unite with him in enjoining upon all users of steam power the necessity of having their boilers periodically inspected, as being the means of all others of preventing the appalling occurrences which every now and then shock the community.

One-Story Factory Building.

The new discussion in reference to mill architecture is still attracting much attention in New England, and important changes are looked for in the near future in the substitution of one-story buildings for the high structures heretofore employed. This idea is about to be carried out on a large scale by the Willimantic Linen Company of Connecticut. The design contemplates having all the work done on one floor, the machinery to be run by shafting in the basement, and the power to be supplied from engines in the engine house behind the main building. By so bringing all the operations together, it is claimed that there is a very great saving of labor.

The area of the contemplated building is nearly three and a half acres, its ground dimensions being 820 by 172 feet. There will also be an annex at each end of 70 by 50 feet. The hight of the main building from the water table to the eaves is to be 16 feet, and there will be three towers, each 40 feet high, with provisions for ventilation in the piers.

Mill owners and managers will watch this experiment with interest, and undoubtedly many of the architectural ideas involved in this plan will be adopted and carried into effect in the erection of great mills in the future. Where land can be obtained at a reasonable price, the advantages to be obtained in the way of plenty light, good ventilation, convenience, and safety in case of fire, speak strongly in favor of the adoption of one-story factories, especially if this can be secured without sacrificing architectural beauty.

A NEW CASK AND BARREL HOOP.—Advertisements have recently appeared in several journals and a patent taken out for a barrel hoop made of wire bent into corrugations, so that it has a serpentine form. It is claimed that this hoop, when driven upon a dry barrel or tub, will compress and hold the staves tightly together, like the ordinary stave hoop, but will have elasticity or spring enough to stretch when the staves expand by moisture, and return to its former position when the staves again contract on becoming dry; in this way the hoops will adapt themselves to the expansion and contraction of the barrel and the annoyance of loose or bursting hoops will be avoided. By forming the corrugations to rest flatwise against the staves, no obstruction is offered to rolling in case of barrels, while a much greater amount of friction surface is brought to bear upon the staves, increasing their holding power. The ends of the wire are secured together by the twisting of one end around the other. These hoops, being made of wire, will withstand corrosion much better than flat hoops, as less metal comes in contact with the wood and less opportunity is afforded for the retention of moisture.

HARDENING SMALL TOOLS.—It is said that the engravers and watchmakers of Germany harden their tools in sealing wax. The tool is heated to whiteness and plunged into the wax, withdrawn after an instant and plunged in again, the process being repeated until the steel is too cold to enter the wax. The steel is said to become, after this process, almost as hard as the diamond, and when touched with a little oil or turpentine the tools are excellent for engraving, and also for piercing the hardest metals.

SCIENTIFIC PROGRESS.

An Expert's Story of the Missouri Tornado.

Prof. John H. Tice, the well-known meteorologist, who went to Marshfield to investigate the phenomena connected with the late storm, telegraphed the St. Louis *Republican* as follows:

"Everywhere along the track of the tornado there is evidence of a wave of water flowing in the rear of the cloud spouts. At some places there are only faint traces of such a wave. At others the debris is carried up and over obstructions two or three feet high. These waves or currents flowed in the greatest volume up hills. There are places where the entire top soil is washed away by the currents. Fibrous roots and tufts of grass show their direction to have been up hill, and what is more significant, from all points of the compass toward the top of the hill when the tornado was raging at the time and expending its force. No trace at any point can be found where they flowed down-hill. Many level places are swept clean of soil. Leaves, grass, debris of wrecked buildings and fragments of planks carried along by the current and left in its track, arranged themselves longitudinally to the current.

"The following is vouched for by George Gilbert of this place: He and his wife and four children were on a visit eight miles in the country, and the center of the tornado passed within five or six yards from where they were. A wave of water, apparently 15 feet high, rolled in the rear of the point of contact of the cloud spout with the earth. It rolled over them in a second, and was icy cold, drenching them thoroughly. About two miles northeast of the town, stones weighing from 500 to 700 pounds were lifted out of the earth and carried along some distance in the track of the tornado.

"J. H. Williams, presiding Justice of the County Court and residing in Panther Creek valley, tells me a stone fell in the center of a field belonging to H. Rose, the weight of which was estimated at two tons. It is not known whence it came."

The tornado, so far as is known, commenced in Arkansas, in Stone county. In Crow Creek settlement 10 persons were killed, and on Flat creek six persons were killed.

NEW (?) METALLIC ELEMENTS.—Seguin Scacchi, an Italian chemist, has detected what he affirms to be a new element in certain ancient Vesuvian lavas. The alleged new body appears from the description to be allied to vanadium and molybdenum. He proposes to give it the name of *Vesbium*, from the ancient name of Vesuvius. The particular occurrence of this alleged new body is in certain green and yellow incrustations occurring on the lava of 1631. Herr Dahl is again to the fore with some additional particulars of his recently-announced element. This, it may be remembered, he observed in the red nickel pyrites of Kragerœ, and proposed for it the name *Norewgium*. In the present communication he appears to have succeeded in isolating it, and to have determined its physical and chemical characteristics with sufficient certainty to establish the genuineness of his claim to the discovery of a new element. Norwegium, he states, is white; not very ductile; sp. gr., 9.44; melting-point,, 350° C. (662° Fahr.); and is dissolved in nitric acid with a blue color, which becomes green on dilution. Its solutions are precipitated green by alkalies, but the precipitate dissolves in excess. Sulphureted hydrogen gives a permanent brown precipitate. Before the blow-pipe, it gives yellow glasses, which become blue on cooling.

CAUSES OF FATIGUE IN READING.—An important study has been made of this subject by Dr. Javal, Director of the Laboratory of Ophthalmology of the Sorbonne, published in the *Annales d'Oculistique*. The fatigue of the eyes which is so often complained of by literary men he believes due to a permanent tension of accommodation. Reading requires constant, steady strain of the eyes, while many other occupations demanding close attention, do not need constant sight. His researches extend to the question of great economical importance: Given a surface of paper and a number of words to print upon it, what rule will secure the maximum of legibility? The answer is: Other things being equal, the legibility of a printed page does not depend on the height of the letters, but on their breadth. This fact is of special importance in the preparation of school books, and Dr. Javal's suggestions should receive the attention of publishers, type founders and school boards.

ELECTRIC PHENOMENON.—E. Lamaire observed the following phenomenon during a snow storm: The wind was blowing from E. S. E., the sky being very cloudy and the thermometer was standing at 1° below zero (30.2° F). At the beginning of a violent squall of snow little luminous points appeared at the extremity of each of the iron ribs of his umbrella, accompanied by a rustling similar to the buzzing of an insect. When he approached his ungloved hand to one of these points he felt a slight shock in the first two fingers, and the light disappeared. The experiment was repeated many times, and the phenomenon lasted four or five minutes, until the umbrella was covered with a thin coat of snow.—*Comptes Rendus.*

Important Spectroscopic Observations.

In a late paper, sent to the German Chemical Society, Herr H. W. Vogel makes the interesting announcement that he has succeeded in detecting a number of new lines hitherto not noticed in the spectrum of hydrogen. Up to this time, it has been held that the hydrogen spectrum consisted essentially of four lines. Vogel took a number of photographs of the spectrum of hydrogen in Geisslor tubes filled with the gas, and obtained, along the four lines already known, a great number of others, among which several of the violet and ultra-violet were remarkable for their intensity and definiteness. To make sure that these new lines pertained to hydrogen, the author repeatedly photographed the spectrum of electrolytic hydrogen concerning whose purity he entertained no doubt. Among these new lines, one is particularly remarkable for its brightness and for the fact of its coincidence with Fraunhofer's line H', generally attributed to calcium, to which body Fraunhofer's line H" also belongs. From the existence of this conspicuous line, which he designates as the fifth hydrogen line (Hδε), Vogel draws some interesting conclusions bearing on Lockyer's alleged discovery of the dissociation of calcium at high temperature.

From the fact that the spectrum of calcium becomes modified at high temperatures, Lockyer has conjectured that this body becomes dissociated at such temperatures into two elements, X and Y, to one of which the first H-line belongs, and the second to the other. He has not, however, thus far succeeded in actually effecting this dissociation by artificial heat. He believes, however, that this takes place in the high temperature of the "white" fixed stars, and depends for this belief on Huggins' spectra of Sirius and Vega, in both of which the first of the H-lines is present, while the second is either altogether absent or hardly recognizable. Vogel explains this fact differently, and ascribes the solitary H' line seen in the star spectra, not to calcium, but holds it to be the fifth hydrogen line. He is supported in this inference by the fact that in Huggins' star-lines in violet and ultra-violet, in addition to the well-known hydrogen lines, there are many others which agree so manifestly with those observed in his photographs that he holds their identity to be beyond doubt. He therefore affirms his belief that Lockyer's conclusion as to the dissociation of calcium, based on spectrum observations, is not justified, and that, on the other hand, the isolated appearance of the H'-line (without H") is simply the fifth line of hydrogen, which he has discovered.

DISTRIBUTION OF ATMOSPHERIC PRESSURE.—L. T. de Bort calls attention to the fact that in two columns of air, which have the same pressure at the surface of the ground, if the temperatures are different the decrease of pressure in the higher levels is slower in the warmer column. Hence results a tendency of the air to pass from the warmer to the colder column, accompanied by a falling barometer in the former and a rising barometer in the latter. The effects of difference of temperature being generally opposite to those of barometer pressure, the transfer of air may be effected in the upper atmosphere, even when the pressure is lower at the bottom of the column. The ocean currents, in winter, augment the energy of the atmospheric disturbances by increasing the opposition which already exists between the continental and oceanic temperatures.—*Comptes Rendus.*

A NEW and powerful thermo-electric battery which is spoken of in terms of the highest praise in the French journals, has been devised by M. Clamond, whose name is already associated with the substantial improvement of this class of apparatus. The apparatus referred to could not be understood without an illustration and description of special features, and for these we refer our readers to the pages of *La Nature* (Paris) for January 17th. It must suffice to say here that the apparatus is designed to produce electricity by the direct transformation of heat, and has demonstrated its utility for this purpose beyond question. The largest apparatus thus far constructed by M. Clamond is composed of 6,000 couples, with which he has been able to run two Sorrin electric lamps yielding a light of from 800 to 1,000 candles for each lamp, with the consumption of 8 to 10 kilos (17-5 to 22 pounds) of coal per hour.

FALL OF METEORIC DUST.—Prof. Silvestria, of the Catania observatory, reports the fall on the night of the 29th of March of a shower of meteoric dust, mingled with rain. Besides the usual characteristics of color, chemical composition, and the mixture of mineral and organic particles and minute infusoria, there was a considerable proportion of iron, either in a purely metallic state or in metallic particles, coated with oxide. The size varied from a tenth to a hundredth part of a millimeter, and the form was either irregular or spherical, as if it had undergone fusion. This phenomenon was first observed in the Indian ocean, south of Java, in 1859, and has been corroborated by Prof. Nordenskjold's Arctic observations.

M. L. COLLOTT has discovered the true *Phylloxera vastatrix* upon *Vitis caribbæa*, a wild species of vine found in the forests of Panama, far removed from any vineyards or localities where the true vine (*V. vinifera*) is cultivated. This strongly confirms the opinion that the *phylloxera* is indigenous in America.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 22.		Week Ending Apr. 29.		Week Ending May 6.		Week Ending May 13.	
Alpha	7	6¾	7	6¾	6¾	6	5¾	5
Alta	3.30	2.85	3	2	2.35	1.95	2.30	1¾
Andes	1.30	95c	1	75c	95c	80c	75c	60c
Alps	....	....	....	....	....	....	....	....
Argenta	65c	45c	50c	35c	35c	20c	25c	15c
Atlantic	10c	....	....	....	10c	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	3	2.40	2.60	1.45	2.55	1.70	2.30	2
Belmont	40c	30c	55c	40c	35c	....	....	....
Best & Belcher	12¾	10¾	11	8½	9¾	8	8½	6
Bullion	3.35	2.80	3¾	2¾	3¼	3.05	2.85	2.40
Bechtel	1¾	....	2	1¾	1.60	1¼	1.30	1¼
Belle Isle	65c	60c	50c	....	60c	50c	50c	45c
Bodie	8¼	3⅜	8½	7⅜	8	7¼	7¾	6
Benton	2¼	1.80	1.80	1.10	1.45	1.05	1½	1
Bulwer	5⅝	....	6¼	6¼	5¾	5¼	6	7
Boyle	....	....	....	....	....	....	....	5½
Black Hawk	1	70c	90c	75c	80c	70c	75c	50c
Belvidere	3¼	3.05	3.30	2¾	2¾	2¾	2¾	2½
Booker	50c	45c	40c	30c	50c	35c	40c	30c
Caledonia	95c	65c	85c	50c	70c	30c	35c	25c
California	2.50	2.60	2.80	2.45	2¾	2.10	2.20	2
Challenge	1.85	1.65	1.85	1¼	1.60	1¼	1.40	80c
Chollar	5	4¼	4.80	3.90	4.35	3.95	3.80	3.05
Confidence	6¾	6¼	6¾	5¾	6	5¾	5¼	4
Con Imperial	45c	40c	40c	30c	40c	30c	35c	30c
Con Virginia	3¾	3.20	3¼	2.80	3.45	3	3.05	2¾
Crown Point	2¼	1.95	2.10	1.70	2	1.70	1¾	1½
Con Wesboe	....	....	....	....	....	....	....	....
Champion	1.10	90c	90c	70c	95c	60c	80c	70c
Concordia	1.20	1.05	1	60c	1	90c	1	85c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	25c	....
Dancy	....	....	....	....	....	....	....	....
Day	95c	85c	90c	85c	90c	55c	55c	50c
Eureka Con	19¾	18½	20	19¾	20	19¾	19¾	18½
Exchequer	2.70	2.40	2.65	2.05	2.55	2	1.95	1½
Endowment	30c	25c	30c	25c	25c	....	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	95c	75c	85c	60c	70c	60c	70c	50c
Gila	....	....	....	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodshaw	35c	30c	30c	25c	55c	20c	70c	55c
Gould & Curry	5¾	5¼	5¼	3¾	4¼	3.85	3.80	3.20
Hale & Norcross	5¾	5	4.95	3¾	4.35	3.30	3¼	2.60
Hillside	30c	25c	35c	....	35c	25c	25c	....
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	45c	30c	60c	30c	30c	....
Julia	1.35	1.10	1.20	75c	1	75c	75c	65c
Justice	2.05	1¼	1.65	1	1¼	1	90c	75c
Jackson	4	3	4	3¼	3¼	....	3¼	3
Joe Scates	....	....	....	....	....	....	....	....
K K Con	4	....	4	....	4¼	....	4¼	....
Kentuck	3	2.90	2¼	2	2.60	2¼	2¼	1¼
Keystone	....	....	....	....	....	....	10c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	20c	....	....	....	....	....	15c	....
Lady Wash	70c	55c	60c	40c	45c	35c	40c	30c
Leopard	....	....	5c	....	5c	....	....	....
Leviathan	35c	20c	35c	30c	30c	25c	30c	....
Leeds	25c	....	....	....	....	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	15c	25c	....	25c	20c	20c	10c
Modoc	....	....	....	....	....	....	....	....
Manhattan	1	....	1	....	....	....	....	....
Martin White	35c	25c	90c	80c	85c	....	85c	....
McClinton	60c	60c	60c	50c	45c	35c	40c	35c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	10¾	10	10¾	6¾	8¼	6¾	7¼	5¾
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Virginia	....	....	....	....	....	....	....	....
New York	25c	20c	20c	15c	15c	10c	35c	25c
Northern Belle	15¾	13	14¾	11¾	11	8¼	11	9¾
New Coso	....	....	....	....	....	....	....	....
Navajo	40c	25c	35c	25c	45c	25c	30c	25c
Occidental	2.05	1¼	1.60	1	1¼	1.10	90c	55c
Ophir	10¾	10¼	10¼	5¾	8¾	6¾	8¾	6
Oriental	....	....	....	....	....	....	....	....
Overman	1.55	1.40	1¼	85c	1.20	60c	1¼	1.05
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	2	....	....	....
Phil Sheridan	....	....	15c	10c	15c	....	6o	....
Potosi	3.70	3.60	3.60	2¾	3.40	2.95	2.80	2.20
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	30c	25c	25c	6c	20c	5c	30c	25c
Richer	....	....	....	....	10c	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	4¼	3.95	3.95	2¾	3.60	2.45	3.40	3
Seg Belcher	....	....	....	....	7¾	....	9	6¾
Sierra Nevada	15	15	15¾	9¼	11¾	9¼	10¾	8
Silver Hill	75c	60c	60c	30c	40c	25c	25c	10c
Silver King	5	4¾	5	4.90	6	4¼	4¾	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	1.10	1	1.10	1	1.10	1	1.30	1.05
Scorpion	2¼	2.15	2¾	1.10	1¼	1.10	1.15	85c
Solid Silver	10c	....	....	....	....	....	....	....
South Bodie	30c	....	....	....	....	25c	20c	35c
South Standard	....	....	....	....	....	....	....	20c
Star	25c	....	30c	25c	30c	25c	30c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1.40	1.20	1.30	1.20	1¼	1	1	....
Tioga Con	2	1.90	2.10	2	2.05	1.60	1¾	1.55
Tiptop	5	5	7¼	6¾	5¾	5	6¾	5¾
Trojan	....	....	10c	....	....	....	10c	....
Union Con	26	24¾	26	18	21	17¾	18¾	14¾
Utah	12¾	9¾	10	6¾	8	6¾	6¾	5
Vermont Con	....	....	....	....	....	....	....	....
Ward	2¾	2	2.10	1¾	1.65	1¾	1.30	1.05
Wells-Fargo	....	....	....	....	....	....	5c	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	7¾	7¼	7¾	5¾	5	5¼	5¼	4.10

Sales at S. F. Stock Exchange.

Thursday A.M., May 13.

80 Alpha 51
340 Alta .....2¼@2.15
600 Andes 70c
320 Bullion .....2.85@2.80
310 B & Belcher .....7¼@8¼
485 Belcher .....2@2.30
410 Benton .....1.45@1¾
30 Confidence .....4.90@5
140 California .....2.15@2.10
260 Chollar .....3.55@3¾
170 Con Virginia 3¼
275 Crown Point .....1.60@1.65
400 Con Imperial .....36@30c
450 Caledonia 35c
70 Challenge 1¼
180 O Dorado 90c
355 Exchequer 1.90
50 Essex 1.30
240 Gould & Curry .....3¾@3.80
515 Hale & Nor .....3.15@3¼
100 Justice 90c
110 Julia 65c
85 Kentuck 2
455 Lady Wash .....40@35c
490 Mexican .....7@7¼
550 Mackey .....5@10c
550 New York .....30@35c
100 N Bonanza 30c
320 Overman .....1.35@1.30
330 Occidental .....1.05@1
535 Ophir .....8@8¾
100 Potosi 2.60
840 Silver Hill 15c
150 Savage 3.40
100 Scorpion 1.10
881 Sierra Nevada .....10¼@10¾
1240 Utah .....6¾@6¾
635 Union .....18¼@18
155 Ward 1.30
1535 Yellow Jacket .....5@5¼

AFTERNOON SESSION.

545 Addonda .....90@80c
150 Argenta 20c
1530 Albion .....30@35c
100 Belmont 15c
415 Bodie .....6¾@7
50 Bechtel 1.60
310 Belvidere 23
100 Bulwer 5¾
200 Black Hawk .....60@55c
400 Booker 35c
740 Boston .....1.60@1.70
100 Champion 70c
50 O Pacific 3
100 Concordia 90c
150 D Standard 70c
20 Dudley 20c
55 Day .....50@55c
40 Eureka Con 15
225 E Mt Diablo .....40@50c
300 E Noonday 60c
115 Grand Prize 75c
250 Goodshaw .....95@90c
100 Holmes 1.30
350 Independence .....15@25c
55 Jupiter 1.60
80 Jackson 3
190 Mammoth 3¼
100 Metallic 45c
20 Mono 3
100 McClinton 40c
50 Mt Potosi 65c
100 Mt Diablo 15
100 Northern Belle 11¾
190 N Noonday 5¾
20 Noonday 4¾
65 Oro 3
200 Orient .....25@30c
100 Queen Bee 35c
100 Raymond & Ely 30c
100 Real del Monte 85c
50 Red Cloud 35c
100 South Bodie 30c
160 Syndicate 1
750 Summit 1¾
20 S Bulwer 1.35
350 Tiptop 6¾
100 Tuscarora 15c
100 Tioga Con 1¾
850 University 25c
150 Wales 3.05

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	3	20	Mar 25	Apr 30	May 21	T H Dixon	328 Montgomery st
Alpha Con M Co	Nevada	12	1 00	May 12	June 16	July 7	W Willis	309 Montgomery st
Alta S M Co	Nevada	17	50	Apr 5	May 10	May 31	W H Watson	302 Montgomery st
Argenta M Co	Nevada	5	25	Apr 28	June 2	Juns 22	E M Hall	327 Pine st
Belcher S M Co	Nevada	22	75	Apr 2	May 5	May 27	J Crockett	203 Bush st
Benton Con M Co	Nevada	3	50	Apr 2	May 7	May 25	W H Watson	302 Montgomery st
Booker Con M Co	California	5	20	May 10	June 15	July 7	W H Lent	309 Montgomery st
Bullion M Co	Nevada	14	1 00	Mar 25	Apr 28	May 18	J M Brazill	Safe Deposit Build'g
Caledonia M Co	Nevada	31	50	May 4	June 8	June 28	R Wegener	414 California st
Con Imperial M Co	Nevada	11	10	May 5	June 8	Juns 28	W E Dean	203 Bush st
Crown Point M Co	Nevada	41	50	May 8	Juns 11	July 2	J Newlands	203 Bush st
Dudley M Co	California	3	25	Apr 20	May 24	June 22	E C Maston	309 Montgomery st
Equitable T & M Co	Utah	22	10	Mar 22	Apr 30	May 21	J J Collins	227 Montgomery st
Gila S M Co	Nevada	7	25	Apr 20	May 24	June 14	W W Parrish	330 Pine st
Hale & Norcross	Nevada	64	50	May 11	Juno 15	July 8	J F Lightner	309 Montgomery st
Independence M Co	Nevada	6	25	Apr 19	May 25	June 14	E M Hall	327 Pine st
Julia Con M Co	Nevada	12	40	May 12	June 16	July 6	H A Charles	419 California st
Jupiter M Co	California	8	40	Mar 31	May 4	June 3	E C Masteu	309 Montgomery st
Leopard M Co	Nevada	13	10	Apr 5	May 7	May 28	E M Hall	327 Pine st
Mexican G & S M Co	Nevada	11	1 00	Apr 28	June 1	June 21	O L McCoy	203 Bush st
Mammoth M Co	California	4	1 00	Feb 18	Apr 24	May 21	A W Rose	302 Montgomery st
Martin White M Co	Nevada	6	50	Mar 22	Apr 28	May 20	J J Scoville	309 Montgomery st
Mackey G & S M Co	Nevada	3	10	Apr 25	June 1	June 21	J W Budlington	309 California st
Chollar	5	4¼	4.80	3.90	4.35	3.95	3.80	3.05
Monte Christo Con M Co	California	3	10	Mar 19	May 8	June 3	B Burris	309 Montgomery st
Navajo M Co	Nevada	6	10	Mar 22	Apr 23	May 14	E M Hall	327 Pine st
North Bonsnza M Co	Nevada	5	25	Mar 20	Apr 24	May 25	W W Stetson	309 Montgomery st
Ophir S M Co	Nevada	35	1 00	Apr 10	May 13	Juos 3	O L McCoy	203 Bush st
Overman S M Co	Nevada	45	50	Apr 5	May 12	June 4	G D Edwards	414 California st
Raymond & Ely M Co	Nevada	14	25	Apr 5	May 10	Juns 7	W L Elliott	328 Montgomery st
Red Cloud Con M Co	California	7	20	May 11	June 17	July 9	W J Taylor	310 Pine st
Savage M Co	Nevada	42	1 00	Apr 3	May 6	May 26	—	309 Montgomery st
Scorpion G M Co	Nevada	7	40	Apr 26	June 7	June 30	Geo R Spinney	310 Pine st
Solid Silver G & S M Co	Nevada	3	25	Apr 13	May 15	June 5	R Hewson	320 Sansome st
South Bodie G M Co	California	3	15	Apr 8	May 12	Juoe 3	H Deas	309 Montgomery st
South Bulwer G M Co	California	7	50	Apr 2	May 5	May 27	W Stuart	320 Sansome st
Utah G M Co	Nevada	30	2 00	Apr 28	June 2	June 22	G C Pratt	309 Montgomery st
Yellow Jacket M Co	Nevada	37	1 00	May 5	June 5	July 7	M Otey	203 Bush st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Argonaut M & M Co	California	3	1 00	Mar 30	May 1	May 24	J L Fields	240 Montgomery st
Atlanta M Co	Utah	1	05	Deo 23	Apr 29	May 24	A F McGrew	420 Montgomery st
Black Rock M Co	California	3	15	Apr 2	May 21	June 21	N T Root	223 Beale st
East Mt Diablo M Co	Nevada	1	10	May 7	June 14	July 5	G W Fisher	324 Pine st
Bintracks G M Co	California	3	1 00	Mar 13	May 15	June 1	H King	320 Sansome st
Excelsior Deep Gravel M Co	California	10	10	Apr 21	May 24	June 15	D F Verdenal	327 Pine st
Fairfax M Co	Nevada	2	20	Apr 7	May 26	June 16	O C Miller	324 Pine st
Gover M & M Co	California	42	20	May 5	June 21	July 14	W O Wilson	402 Front st
Hillside M & M Co	Nevada	3	30	Apr 9	May 12	June 7	F Frankenthal	330 Pine st
Kennedy M Co	California	17	1 00	Apr 22	May 17	May 31	A Wissel	210 California st
Mineral Fork M & S Co	Utah	2	08	Feb 21	Apr 30	May 19	S Purdy	331 Montgomery st
Mt Potosi Con M Co	Nevada	3	2 50	May 11	June 14	July 6	E A Holmes	318 Pine st
Murchie G & S Co	California	3	25	Apr 20	May 21	June 21	S D Rodgers	328 Montgomery st
Oro Blanco M Co	Arizona	1	20	May 3	June 7	June 28	W O Gould	220 Sansome st
Relief Con M Co	California	1	10	Apr 3	May 7	May 27	W J Taylor	310 Pine st
Republic Con M Co	California	1	10	Apr 3	May 7	May 27	W J Taylor	310 Pine st
Tioga Con M Co	California	9	20	Mar 22	Apr 26	May 16	W H Lent	309 Montgomery st
Vanderbilt M & M Co	Nevada	1	15	Apr 12	May 20	June 16	J Morizio	328 Montgomery st
Wyoming Coal M Co	Wyoming	2	3	April 21	June 10	July 10	—	—
Wyoming & Dakota W Co	Dakota	2	1 00	May 6	June 16	June 30	T Widman	404 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Florida Hill M Co	Idsho	R Wegener	414 California st	Annual	May 25
Gopher Con G M Co	—	T Widmann	404 Montgomery st	Annual	May 23
Haskin M Co	Nevada	O H Jewell	5½ Kearny st	Annual	May 25
Hillside M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	May 21
Pioneer Con M Co	Nevada	J M Buffington	309 California st	Annual	May 24
San Carlos Coal M Co	—	A J Kopsch	230 Montgomery st	Annual	May 24
Silver King South M Co	—	A Judsou	320 Sansome st	Special	May 9

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	E M Hall	327 Pine st	20	Feb 26
Black Bear Q M Co	California	W L Oliver	Safe Deposit Bldg	25	Mar 15
Bodie Con M Co	California	W H Lent	Nevada Block	25	Mar 1
Cherokee Flat Blue Grav M Co	Cal	R N Wm Brunt	318 Pine st	4 25	Mar 13
Eureka Con M Co	Nevada	P Jacobus	37 Nevada Block	30	Mar 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	50	Apr 24
Great Western Q M Co	California	A Halsey	312 Montgomery st	25	Feb 3
Idaho G M Co	California	C Meade	324 Pine st	2 00	Apr 9
Natoma Water & M Co	California	—	—	2 00	Apr 5
New York Hill G M Co	—	J B Leighton	527 Clay st	25	Feb 20
Northern Bell M Co	Nevada	W Willis	309 Montgomery st	50	May 15
Ontario M Co	Utah	—	—	50	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12

The Mining Share Market.

The prices of mining stocks this week were in some instances lower than they have been in two years. Compared with the highest rates at the end of last week, the minimum figures showed a downward tendency at the opening of the week, but as we go to press a slight reaction seems to have set in. The necessity for economy is apparent on every side. Should the present depression continue much longer, the salaries and current expenses will suffer a material reduction. Those who have large interests at stake on the Comstock, are much concerned what to do. There is serious thought of working the low-grade ores of the upper levels, which cannot be handled without a decided reduction of expenses. Work must be done on a large scale, and at the lowest possible rates. The next thing to consider is means of cheaply pulverizing and concentrating this ore, in which operation there is still a grand field for inventors. It is rather generally believed that the end of stock speculation is close at hand—so complete is the demoralization in the speculative ranks.

The water question in the middle Comstock mines is evidently a serious one. The Gold Hill *News* is of the opinion that the stream which flows into the 2200 level of the Savage is a living oue, otherwise it would have been exhausted long ago. The raising of its influx to the Sutro tunnel level devolves mostly now upon the Hale & Norcross pumps, since Savage has enough in its incline for its own pumps to handle. Chollar has plenty to do to take care of its own water and that from the 2400 level of Savage. There is a prospect, however, of exhausting both the latter inflows, consequently of soon resuming operations on the 2400 level. Belcher, too, has found an increased flow while endeavoring to prospect with the drill further east on the 3000 level. This puts off for a time the knowledge of what lies in the vein of that mine on that level.

The House Committee on Commerce has agreed to recommend an appropriation of $50,000 for the improvement to the entrance of Yuquma bay on our coast.

By three steamships, 3,139 immigrants arrived at New York on the 10th inst.

Quarterly Assessment of Noted Nevada Mines.

Following is an abstract statement from the quarterly assessment roll of the proceeds of the mines of Storey county, Nevada, for the quarter ending March 31, 1880: Belcher mining company, 767 tons of ore extracted; value, $13 per ton; gross yield of value, $9,995.32; cost of reduction, $5,752.50; total cost, $11,062; net yield or value on which taxes are levied, $1,999.06. California mining company, 8,799 tons of ore extracted; value, $26 per ton; gross value, $232,499.43; cost of reduction, $204,752.17; total cost, $204,752.17; net yield, $46,489.88. Consolidated Virginia mining company, 13,777 tons of ore extracted; value, $34 per ton; gross value, $473,776.86; cost of reduction, $322,340.53; total cost, $322,340.53; net yield, $186,500.74. Consolidated Imperial mining company, 3,026 tons of ore extracted; value, $13 per ton; gross value, $35,581.80; cost of reduction, $21,017.10; total cost, $42,698.95; net yield, $7,716.36. Monte Cristo mine, 450 tons of ore extracted; value, $10 per ton; gross value, $4,450; cost of reduction, $2,250; total cost, $4,500; net yield, $445. Ophir mining company, 4,209 tons of ore extracted; value, $33 per ton; gross value, $138,026.19; cost of reducing, $37,888.20; total cost, $226,707.26; net yield, $55,210.47. Savage mining company, 23 tons of ore extracted; value, $35 per ton; gross value, $804.62; cost of reduction, $196; total cost, $2,196; net yield, $32,184. Sierra Nevada mining compauy, 972 tons of ore extracted; valne, $47 per ton; gross value, $46,389.13; cost of reduction, $8,449.12; total cost, $208,773.11; net yield, $18,555.65. Union Consolidated mining company, 17,089 tons of ore extracted; value, $39 per tou; gross value, $674,346.72; cost of reduction, $153,802.35; total cost, $415,230.36; net yield, $269,738.68.

Eureka, Humboldt county, is exercised over the discovery of a wonderful cave of mammoth proportions, about three hours' ride from Graberville. The mouth of the cave is about 700 feet above the bed of the South Fork, on the west side, and up the precipitous east side of Bear Buttes.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

BUTTE.

Good Mining Scheme.—Chico *Record*, May 8: If the reader will turn to the map of Butte county, he will see that on the line between township 21 and 22 north, and range 3 and 4 east, the North Fork makes a big bend to the east, coming around again on the general course of the river some 3 miles below. The proposition is to tunnel through on the general line of the river, and turn the stream through, thus drawing some 11 miles of the main channel of the North Fork. The tunnel will have to be only about 1 mile in length, when it will strike a ravine that will carry it into the West Branch, and thence into the old channel of the North Fork. It is believed that this will open one of the richest and most extensive river mining claims ever known, and cannot fail to be profitable. The matter is, we understand, in the hands of New York capitalists, and will be commenced at an early day. It is expected that it will take a year to drive the tunnel and erect the dam so that the river can be tunneled. It is a magnificent scheme, and we hope to see it inaugurated at once.

Good Clean-up.—*Register*, May 7: The Powers claim, opposite town, cleaned up last week, and for an 11-day run realized 35 pounds of amalgam, worth about $100 per pound. This result was the work of 4 men and about 1,000 inches of water. The present clean-up is not an unusual one, as the claim has been paying steadily ever since it was put in working order by the present owners. No mine in the county can show better results for the labor and capital invested than the Powers & Co. mine. This mine, while less talked about than any of the hydraulic mines in the county, consists of 1,500 acres, with a perfect title derived from the confirmed Fernandez Mexican grant. The mine was worked for several years by its former owner, M. B. West, in a small way, having to depend on the rains for his supply of water, who became rich upon the proceeds. About 4 years ago, Powers and his partner, being practical hydraulic miners, purchased the property for, we believe, $50,000, and went to work, and with an outlay of about $25,000 put the mine in excellent working order. From which time until the present it has not failed to yield a handsome return. We have it from a source which we deem reliable, that in the 2 and little more years it has been worked by the Powers' company, it has paid back to its owners nearly ¾ of the $76,000 invested, besides paying interest at the rate of 12% on half the purchase money, as well as the money borrowed to pay for the improvements made before commencing work. The 1,600 acres probably averages in depth 76 ft. The entire ground has been prospected from shafts sunk in every direction, hence the value of the mine is no longer a matter of speculation. Notwithstanding the 2 years working, and the amount of gold taken out, scarcely an impression has been made towards exhausting the mine. It is safe to say that 100 years of constant work, with the amount of water now used, would not exhaust it. Was this mine located on the eastern border of Idaho or in the mountains of Plumas county where it could only be worked 6 months in the year, on account of snow and ice, with distance or lead equipment to the view, instead of within rifle shot of the court house at Oroville, we think it no exaggeration to say that it would have been purchased by Eastern capitalists before this time.

EL DORADO.

Pilot Hill Mines.—El Dorado *Republican*, May 4: I know of no mining locality that offers better indu ements in quartz operations than the Pilot Hill district, and a fair trial and the introduction of a quartz mill will soon make it a favorite camp; it is, therefore, with no ordinary degree of satisfaction, that I glean that Mr. F. C. Leavitt has contracted for the purchase of two quartz locations at Hogg's diggings. The Louisiana is the first western extension of the Hunt quartz mine (patented) on the Hunt ledge, and is situated on the hill south of Hogg's Diggings Flat, famous for the rich surface on it, and in Indiana ravine, which runs from the ledge on to the flat, and the immense nuggets that have been extracted therefrom, and some of which are occasionally found yet. The ledge in the Louisiana prospects well in free gold, and coutains iron pyrites and copper sulphurets. In early days the croppings all along this ledge were worked in a small mill, yielding an average of $15 per ton, but the mill ceased to work in '58-9, and soon disappeared; gold was plentiful in the ravines and flats, and quartz mining was little known or sought after. Little work has since been done for the want of machinery; but Mr. Raimundo, with ever-abiding faith in the future, has held on to his locations, in the hope of some day being able to work them, and after 25 years' residence hopes now to see his dreams realized by the proof that the quartz ledges in the hills contain more wealth than has ever been obtained from the rich alluvial deposits in the flats and ravines surrounding them. The other mine is the Josephine, located about a mile northwest from the former, across Knickerbocker creek. Mr. Raimundo, some years ago, hauled several tons of ore from this mine to Ophir, Placer county, for reduction, and obtained a result of $25 per ton. Wood is quite plentiful in the vicinity of these mines, and water available. I understand the price is $5,000 for each mine. A commencement being made, attention to other locations in the neighborhood will ensue, and several of them, especially the Pilot Hill mine, Buchan & Co.'s location, in Folsom ravine, are very promising.

Spanish Dry Diggings.—Mr. George Bower informed me on Tuesday last that he had purchased the Ricci & Co. mine at this place. This has been a remunerative mine since 1856, and now requires capital and machinery to work it more efficiently and profitably.

The Seam Belt.—Mr. Desmarais has will recommence washing in the French claim to-morrow. Mr. White, of San Francisco, will commence this week a tunnel to run to the seam belt from American canyon on the claim adjoining the Bower mine to the north.

Rich.—*Mountain Democrat*, May 8: Last Tuesday a couple of strangers brought 1,500 pounds of quartz to the Griffith consolidated mill, near Diamond Springs. Griffith had it crushed, and it yielded 31 pounds of retorted amalgam, worth about $3,000. The men said they had only been six days on the ground from which this rock was taken, and had only been two days taking it out. Young men, or old men either, for that matter, had better make a note of this and start out on a pocket hunt. Two thousand dollars a day to the hand is good wages. We doubt whether Skagit is any better.

INYO.

Cerro Gordo.—*Independent*, May 8: Mr. Wm. Crapo has had a good force at work on the Crapo property—the old Buena Vista ledge at Cerro Gordo—drifting into its immense croppings preparatory to sinking. The outcrop is visible as far as Buena Vista mountain can be seen, and consists of an ore body 300 ft in length and from 30 to 50 ft wide, sampling $102 per ton in silver and gold. It would require years for a 20-stamp mill to make a respectable hole in this bonanza, which is pronounced by all mining men who have seen it as almost marvelous in its extent.

KERN.

Antimony.—*Californian*, May 6: Mr. Stephen Boushoy was in town on Tuesday; he had just returned from his San Emidio antimony mine, which he reported to be in excellent condition. He has bought the rights of the other owners, and now claims to be the sole owner. He has bonded the mine to some Philadelphia capitalists for $300,000, and he left here on Tuesday night for the East to consummate the sale. This mineral has advanced very much in price, and is now quoted at 21 to 22 cents per pound. His mine is said to be very rich. The new pur-

chasers are said to have abundance of means, and intend to commence work in July, when they will probably have 150 miners at the scene of operations. Mr. Boushey thinks very favorably of the James one-track railroad, and believes it will be of great usefulness in taking supplies to and in bringing ore from the mine.

LOS ANGELES.

SANCHEZ MINE.—Mr. Jose Sanchez has returned from the Mohave mining district with very rich and remarkable specimens of galena and silver ore from the Sanchez mine. The ledge is 4 ft in width, and has been traced 1,000 ft. It has been prospected to a depth of 10 ft, and shows astonishing richness. In a few days teams will be sent to the mine and a shipment of ore made to San Francisco for sale. An assay last week of the Champion, Chieftain, Noble, Soledad, Troubadour and Empress mines yielded on an average $35.39 per ton. This great mining district should be a source of great profit to Los Angeles. A furnace will be put up immediately, and as there is plenty of wood, the work of reduction will proceed without delay.

MONO.

LAST CHANCE.—*Chronicle*, May 8: The crosscut from station on 300 level has been advanced during the past week 12 ft; total length, 20 ft, with no change to note in formation. A vein about 2 ft in width was cut when about 12 ft from station, and pitching slightly to the west. This vein has good clay walls, and the vein matter is quartz and clay, some of which gives fair milling assays. The vein possesses every characteristic of being a permanent one.

HOMER M. & M. Co.—The east crosscut from the Cravasse tunnel has reached a distance of 42 ft from the starting point; face of the work is in good blasting ground, with no change to note in formation. The west crosscut, from same tunnel, is in 144 ft; rock is somewhat harder, and progress correspondingly slow.

TIOGA.—The east crosscut, 800 level, was advanced 14 ft during the past week. A vein of quartz 2 ft wide has been cut through, which prospects very well by the horn process. Assays are being made from this vein. West crosscut, same level, has had 27 ft added to its length since last report. There is considerable quartz coming in on the face of this drift, and the porphyry is very favorable in character.

KING BEE.—*Free Press*, May 9: The recent developments in the North Noonday and Oro mines have lent new interest to mining operations in that section. Among the most eligible located mines to the south of the Noonday is the King Bee. It is situated on the eastern slope of Queen Bee hill, is bounded on the north by the Noonday, Booker and Spaulding mines, and on the east by the Maryland Con. and Boston Con. The tunnel was run into the hill 445 ft, in which direction 5 ledges were cut, of various sizes and values. The first 3 are from 1 ft to 18 inches in width, of quartz and clay mixed, from which good assays are obtained. The 4th vein is the principal feature of the property. It is 12 ft in width from wall to wall, of clay, quartz and vein matter, the quartz largely predominating. The vein has an easterly pitch of about 75°, and on the hanging wall side has a blue clay wall about 1 ft in width —such a wall as on the Comstock would be considered a most favorable feature. A vertical shaft was started about 300 ft southeast of the mouth of the tunnel, up the hill, which has now attained a depth of 250 ft. At a depth of 145 ft a ledge was cut about 18 inches in width, pitching east at about an angle of 75°. It is nearly clean ore, some of which is high grade. Seams and stringers of quartz, all giving assays, were frequently cut in sinking. At the bottom, crosscuts have been started east and west. That to the east is in about 18 ft in very hard rock; that to the west is in 24 ft, in a porphyry formation of a favorable character.

NEVADA.

VULCAN.—Grass Valley *Union*, May 8: The Vulcan mining company will have their new 6-inch steam pump in place and ready to start up during next week. The prospect shaft is down 100 ft, and has a considerable depth of water standing in it, but this will be taken out in a few days when the pump commences work.

THE new and fine hoisting works of the Fortune mining company, in the Nevada district, are in a state of forwardness. Superintendent Fred Jones is taking advantage of the favorable weather to rush the work.

SUPERINTENDENT PERRINS, of the North Bloomfield mining company, accompanied by a formidable guard, arrived in Nevada City yesterday with a big clean-up of bullion from the mine.

TO RESUME WORK.—*Transcript*,, May 6: Satisfactory arrangements having been made, work will be resumed this week in reopening the tunnel of the Phœnix (old Cunningham) quartz mine. Francis Burns will act as Superintendent.

MIDDLETON.—The new 4-stamp mill of Eureka No. 2 mining company, built by Otis Holbrook, was started yesterday morning. The machinery works splendidly. There are 200 tons of ore on the dump.

PLACER.

MINERS ON A STRIKE.—Nevada City *Transcript*, May 11: The Eastern capitalists who recently purchased the Rising Sun quartz mine at Colfax, gave notice that on and after yesterday the wages of underground miners employed by them would be $2.50 a day instead of $3 as heretofore. The men whose interests were to be affected by this change, numbering about 25 in all, refused to go to work yesterday morning, and the result is that no ore has been extracted from the ledge during the past 24 hours. The striking miners say they will not return to work at the reduced prices, and that they will not permit other parties to do so. The manager of the property is determined that he will have his own way about the matter, and a gentleman who came from the scene of dispute yesterday says there is a prospect of trouble. The men employed above ground are all at their posts as usual.

PLUMAS.

BIG IRON CONTRACT.—Plumas *National*, May 8: H. C. Bidwell, President of the Green Mountain company, has recently concluded a contract with Messrs. Manson & Co., of the Greenville Iron Works, for all the machinery necessary to equip the new 60-stamp mill which the company proposo to erect this summer. The castings are to be completed by the 15th of July, and will cost the company about $22,500 at the foundry. The total weight of the castings will be nearly 200 tons. All the modern improvements will be introduced in constructing the batteries, ore-breakers, self-feeders and amalgamating appliances, and the mill, when finished, will be a model one. We are promised a full description of it, before a great while, for publication.

THE GREEN MOUNTAIN mill last week cleaned up $8,300 for a run of 20 days with 32 stamps. The run paid about $10 per ton, and there is a mountain of the same kind in sight in the mine. The Green Mountain is giving strong evidences of being one of the largest quartz mines in the State.

THE Plumas ditch company is piping with a big head of water.

TUOLUMNE.

CONFIDENCE MINE.—*Union-Democrat*, May 5: The find of a rich lead in this mine some months ago has been verified by running several hundred feet on the chute, which at times pinched out. It is now opened 125 ft on the 800 level, on a continuous chute of high-grade ore, showing gold to the naked eye. Another new development was made about two months ago on the same level, when, in the body of broken vein matter, after driving upward about 60 ft, a 3 ft vein was found, upon which a drift has been run 40 ft, opening a large body of ore that will pay from $25 to $100 per ton. The mill has remained idle the past three or four months for want of a supply of wood. It will be put in operation on Monday next. There is 700 tons of ore now in the mill that will pay $15 per ton, which was taken out prior to the recent discoveries. The outlook for the old Confidence, for returning a handsome sum to its owners, was never better in its palmiest days. Under the management of J. A. Davis, who evinces good mining sense, with William Symons as Superintendent, the mine will be made to yield up what is in it.

ROBERTS.—Work will be commenced at the Rodgers mine, on Piety hill, next Monday. It will take several days to free the mine from water. The incline, which is down some 130 ft, runs all the way on a well-defined vein. Some of the last ore taken out, when the water made too rapid for work in the mine, shows gold We saw two pieces that was picked off the pile that gave good evidence that required no glasses to see where nature had placed the shining metal.

A SHAFT is being sunk on the Rappahanock mine that joins the Raw Hide. The shaft is down about 25 ft, the ore showing good prospects. Divoll and Davis intend to know the value of this mine.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Gold Hill *News*, May 12: The drift on the 2500 level, to connect No. 1 winze with the 2500 station of the Sierra Nevada incline, is in heavy vein matter carrying quartz giving low assays; total length, 65 ft. A drift has just been started from No. 1 winze south on this level to connect with winze No. 2 when it reaches the required depth. Winze No. 2, from the 2400 level, is down 16 ft and in hard vein matter. Sinking has been resumed at the Union shaft.

CALIFORNIA.—Ore averaging $30 per ton is found east of the old stopes on the 1500 level, and will be extracted. The drift north on the 2300 level to connect with that south from the Ophir line and to complete the connection through to the Union shaft on that level is in 60 ft and in a heavy vein formation of clay and quartz.

OPHIR.—The north drift, 2500 level, 330 ft east of the incline, continues in a heavy vein material consisting of clay and quartz, which promises well; total length from the main east drift, 45 ft. This formation gives assays of from $5 to $20.

BEST & BELCHER.—The work of continuing the G. & C. and B. & B. shaft on down makes good progress; total depth, 1,110 ft.

SUTRO TUNNEL.—Excellent progress is being made in the headers of both lateral branches. The main track in the tunnel is being put in condition for the use of the air motors, and they will soon be running to the connection with the north lateral branch.

CON VIRGINIA.—The joint California crosscut on the 2300 level still penetrates a heavy vein formation carrying clay and quartz; total length 112 ft. The C. & C. shaft is 50 ft below the 2300 station. The west drift from the C. & C. shaft, and 30 ft above the 1750 level, is in 70 ft; total distance to run 89 ft. The usual extraction of ores is going on in the stopes on 1750 and 1550 levels.

SIERRA NEVADA.—On the 2300 level the west crosscut on the line of the main shaft is now 62 ft from the main lateral drift. No change of material. The crosscut east, opposite the east winze, is now in 100 ft, and in vein porphyry, mixed with quartz and looking well.

CHOLLAR.—Still pumping and bailing. The ratio of decrease of water noted Saturday—180,000 gallons per day—has not continued, so that it is entirely uncertain when the tanks can be taken off and work resumed in the Chollar south drift.

YELLOW JACKET.—The diamond drill is being sent down below the 3000 level to prospect for work and preparatory to dropping the shaft down 66 ft further, that being the same depth as the 3000 of the Belcher and Crown Point. The work of drilling has been interfered with by the necessity of again bailing the Con. Imperial water, the Belcher having taken it, and when it received a new flow on the 3000 level having turned it back to the Jacket shaft.

JUSTICE.—The east and west crosscuts from the main south drift on the 1650 level are being pushed ahead and are both making good progress through favorable vein matter containing occasional bunches of good ore.

EUREKA DISTRICT.

EAGLE CON.—Eureka *Sentinel*, May 9: While sinking an incline shaft on the Eagle Con. mines, H. S. Ferloy opened up a large cave, which seems to be at least 75 or 100 ft deep. At the opening of the cave several bunches of good carbonate ore have been taken out, and it is hoped that Mr. Farley will soon uncover a large deposit of ore.

THE Ventnre series of mines consistiug of 3 claims, situated on the northwest slope of Adams hill, and owned by Capt. Potter, Superintendent of the British mining and milling company, are bonded to a firm in New York, who expect to make a sale at an early day.

IN THE K K, drifts are being extended to connect with the Eureka Con. Connections will be made with the 5th, 9th and 11th levels of the latter, thus facilitating operations in both mines.

NUMEROUS PROSPECTORS are hunting up eligible locations along the western slope of Prospect mountain and the foothills in Spring valley.

THE Mountain Boy has a quantity of good ore on the dump, and will soon commence to ship to the Richmond reduction works. H. C. Kirkpatrick and e few others are now working the mine on lease.

THE owners of the Lillio L have started a tunnel to tap the 2 ledges 150 ft from the surface. By running the tunnel 225 ft it will strike the ledge about 70 ft from the starting point.

THE Atlantic & Pacific company have started a tunnel to develop their claims on east side of Prospect mountain, near the Fourth of July mine. They will have to run 500 ft before reaching their own ground.

THE Jackson new shaft is now down 670 ft. At the 720 level, drifting will be commenced. A little water has been encountered, but it is easily handled.

THE owners of the Alexandria have purchased machinery in the East, and the same will be placed over the shaft on its arrival here in a few weeks.

THE building and machinery are being put in place on the Wales Con., and steam is to be gotten up in 2 weeks.

THE Rescue mine is closed down at present, but we understand the company will resume work at an early day.

THE Connelly continues to pan out well, and makes a daily shipment of about 15 tons of ore. .

WORK has again been resumed on the Bradford property.

ESMERALDA DISTRICT.

EXCELSIOR.—Esmeralda *Herald*, May 1: For the past two months the *Herald* has been doing all that it possibly could to help the few energetic men of Esmeralda district in wakening up the people to a sense of the richness that lay idle here only waiting for a little display of energy and of capitel to come forth. The fruits of these united labors are commencing to ripen, and before many months will be ready to harvest. Work has already begun on the Grand Trunk, and we now have it from the best authority that on Monday or Tuesday at the farthest a force of men will be put to work on the Excelsior mine, Silver Hill. This is indeed encouraging, and will no doubt be the cause of other mines being worked in this district.

REAL DEL MONTE.—The work still goes on as usual. Two drifts are being run on the 500 level. and fair progress made in both drifts. Superintendent Tyrrell is anxiously awaiting the arrival of timbers to commence sinking in the main shaft, which work will start immediately on the arrival of said timbers.

COMMENCED WORK.—Yesterday the necessary papers were signed and a contract let to run a 200-ft tunnel on the ledge of the Grand Trunk mine. Two shifts were to be put to work, according to the specifications of the contract, and the tunnel pushed forward with all possible speed. This morning the men getting the contract went to work.

I X L DISTRICT.

THE CAMP.—Cor. *Mining News*, April 30: The camp will, at no distant day, be booming. The first thing that attracts the eye of the stranger on his arrival at Roseville is the croppings of the Bayfield mine, which is located directly behind the town, to the north. This mine is owned by Eureka men, and is being worked with energy. They are at present sinking two shafts, both of which are in good ore. At the upper shaft they have over 200 tons of high grade ore piled up ready for reduction. Adjoining the Bayfield on the east is the East Star mine, owned by James Allen & Co., and is being worked under the supervision of Mr. P. Maloney, and although their shaft is not 50 ft deep, it is all in very fine ore, going largely in gold. The I X L and Black Prince mines are a perfect mountain of carbonate and galena ore. I have never seen anything to even approach its gigantic proportion. The whole heart of the mountain seems to be literally one mass of ore extending for a distance of 600 ft. On the 5th of the present month Judge Harlan and W. H. Howard, of Paradise, purchased 10,000 tons of ore from the I X L mine, and intend to begin the reduction of the same as soon as arrangements are completed. The same gentlemen are trying hard to make the amount 30,000 instead of 10,000. Altogether the outlook for the camp is exceedingly bright, and when the boom comes some old timers on the Hill and in Eureka, who are holding claims, may suddenly find themselves rich.

SILVERADO DISTRICT.

QUEEN MINE.—Eureka *Sentinel*: The winze at the bottom of the 168-ft shaft is now sunk to a depth of 58 ft, all the way in good pay ore. This has been one of the best paying little mines in the district, and if in the hands of a good company would soon be not only self-supporting, but would pay its regular dividends. During the past 5 years the Jones Brothers have taken out over $125,000 while prospecting the mine. They have erected steam hoisting works, built water tanks of a capacity of 10,000 gallons, built good roads to the mine, besides making many substantial improvements at a cost of not less than $20,000.

ARIZONA.

ARIVACA DISTRICT.—Tucson *Record*, April 28: In the Arivaca district much work is being done, although the section suffers considerably from the threatening rumors regarding what is termed the Poston grant, which has certainly retarded its prosperity and has already prevented the sale of several meritorious properties. The Arivaca mill is at present running but 10 of the 20 stamps, these crushing ore from a Sonora mine. The ore is put through the batteries dry, then roasted and treated by J. O. Stewart, and finally amalgamated in the mill. The results have so far been very satisfactory, when it is considered that the ore is most rebellious in nature. Not more than from 8 to 10 tons is put through in 12 hours at present, owing to the lack of roasting capacity. The main shaft on the Con. Arizona is down 103 ft, but has, at present, some 60 ft of water, which will prevent further development until the machinery, including a 16-horse power pump, is erected. The Grant gold mine is supposed to be an extension of the ledge above mentioned, and is, to all appearances, among the best gold prospects in the Territory.

COLORADO.

WAR EAGLE.—Central City *Register-Call*, May 7: Assays of ore from this lode have been made which show $1,736.18, silver, per ton. The vein is situated south of the Clifford mine, on Clifford mountain.

BRICK POMEROY.—Georgetown *Courier*, May 6: The lode is opened by an adit 125 ft long, and a shaft has been sunk from its breast to a depth of 60 ft, from the bottom of which a level has been driven 40 ft both east and west. The level, half way down the shaft, has been run east about 20 ft, and some of the ground over it has been stoped. The back of the stope shows a vein of ore from 1 to 2 inches thick that is worth about 400 ounces.

PERU DISTRICT.—The adit on the Whale lode is being pushed ahead by night and day shifts. It is now in 65 ft, and shows a vein of solid galena ore, 5 ft thick, that mills 25 ounces in silver and 60% lead. A new vein of ore has been struck in the Peruvian that sample assays 86 ounces in silver. The ore mills high in lead, and the vein ranges from 6 inches to 8 ft in thickness. The Susquehanna has a vein of galena 30 inches in thickness that assays 86 ounces.

SUNDOWN.—Silver Cliff *Prospect*, May 5: Is producing a gray copper ore that runs as high as 232 ounces in silver and 30% in copper. The company is enlarging the shaft, preparatory to timbering.

LONDON.—Fairplay *Flume*, May 6: There is a large quantity of good ore in sight. Mr. Kuenig, manager of the Golden smelting works, a few days ago contracted for the ore as soon as it can be shipped down.

DAKOTA.

BLACKTAIL.—*Black Hills Times*, April 28: Savage & Noyes are at work on Blacktail with every available man, getting their water ditch ready for hydraulicing at once. The last storm has been a god-send to them. They have a water ditch ½ mile long, which will carry 200 inches of water, and gives them a pressure of over 100 ft. The snow was 6 or 8 ft deep in this ditch yesterday morning, and this all had to be shoveled out. They own 6 of the best placer claims on Blacktail, and have all the ground they can work in the next 10 years. They worked only about 3 weeks last season, but during that time took out big pay. Allen & Carlan, in Deadwood gulch, were busy yesterday with their bedrock flume, the melting snow giving them all the water they could profitably handle. From present appearances they will now make a good season's run.

BALD MOUNTAIN.—W. H. Bull & Co., the owners of the Silver Plume mine at Bald mountain, have concluded arrangements to put a force of men at work. This mine is looking first-class; a tunnel has been run in something over 100 ft, and is showing up good ore at the end. There is but little doubt that the Silver Plume will develop into a mine equally as good as the Suowstorm, and at a very early day. The Trojan mine, higher up on the mountain, is supposed to be on the main ledge of that belt, and shows up richer ore and more of it than any of the mines up there. It is simply a matter of time and there will be mills up there on all of these mines.

IN CENTRAL CITY every mill, excepting the Calcdonia 20-stamp mill, have hung up their stamps; no ore and so much snow that none can be hauled for a day or two.

THE Golden Star No. 2, at Lead, is continuing to improve in appearance as the shaft goes down. It will be remembered that a body of water was struck in this shaft the other day which arose 60 ft. The pumps that were put in soon relieved the shaft of water, and now there is no serious trouble on the water question. The shaft is now all the way in ore, and looking better as they go down. This mine belongs to the Homestake company, and is south of the Homestake mine running towards Pennington.

IDAHO.

YANKEE FORK.—*Herald*, April 24: Messrs. Brown, Schaub and Stein, of the Jordan Creek placer mining company, reached bedrock in their drain a few days ago, at a depth of 24 ft. The drain was started last spring by Eureka parties, but it was thrown up. The present company commenced work in November, and in spite of the severe winter kept the work going. The drain is now about 1,600 ft long, commencing with an open cut of 550 ft in the flat above Chinatown, and the remainder, 1,050 ft, is under cover and well timbered. The drain follows up the bottom on the west side of Yankee Fork, and will not only drain the Jordan placers, but Yankee Fork, which is believed to be very rich in gold. The face of the drain is dry and consequently good drifting. An upraise will be started at once to connect with the surface. The prospects are very flattering, and in a short time the center of the bed of Jordan creek will be reached, where the pay channel without doubt is located. Ray & Co., drifting at the upper end of the Jordan Co.'s ground, are finding many large nuggets and taking out much pay dirt to wash this spring.

THE OUTSIDE CAMPS.—George Parody returned Monday, accompanied by John Foster, from Idaho City, and gives us some interesting items. There is considerable excitement at Shew's Mountain over recent developments, and the Plowmen 10-stamp mill has been moved from Idaho City to that place. There are 4 ft of snow at Idaho City, but all have confidence of a revivel of mining affairs as soon as the snow goes off. The contractors on the Banner mine, at Banner, are opening out that property in good shape, preparetory to taking out ore this spring. R. A. Lake, Pete Albert, Nels Weaver, and twelve or fourteen others, are in Stanley Basin working their placer claims. From the prospects obtained the boys will all have a good run this spring. Several parties who came into Stanley Basin lately had quite a severe trip, having been out several days on very short rations.

STILL THEY COME.—Birch Steele, the original discover and locator of the 79 and 80 claims on Mount Custer, has struck a 3-ft vein in the 79 of very high-grade ore. The cut running in on the vein is about 45 ft in length, and the shaft from this level is down 10 ft on the ore body. The claim is situated a short distance from and northeast of the Custer. The 80 is an extension of the 79 on the west.

STRUCK IT.—*Idaho World*, May 6: Mr. James Irwin commenced work on a tunnel last fall to tap the Panamint, which is situated three or four hundred yards above the Banner quartz mill. He struck it last Friday at a depth of 70 or 80 ft. The tunnel is in 110 ft. The vein is 2 ft wide, and is immensely rich in silver from wall to wall. Mr. Charley Magee brought to town last Monday some fine specimens from this mine—the richest we have ever seen from the Banner district. A piece taken from the poorest streak in the vein is good average rock. The lucky owners of the Panamint are Messrs. James Irwin & Ben. Miller, two energetic miners, and we are glad they have struck a bonanza. Mr. Irwin has spent most of his time since 1867 prospecting in Banner district, and his recent discoveries promises to richly reward him for his labors.

GOLD HILL.—Boise City *Statesman*, May 8: Mr. Jacob Motto, of Quartzburg, informs us that the perpendicular shaft in the Gold Hill mine is now down 400 ft. From the bottom of the shaft a narrow single drift has been run for a short distance, which strikes the ledge in good ore. The company has about 70 men employed in the mine and mill, and are crushing an average of 45 tons per day.

MONTANA.

ROCHESTER DIGGINGS.—Oloudnle *Atlantis*, May 5: Henry Harlow and Daniel Moynihan went in last November, prospected in a number of places and finally sunk on what is called the Moynihan ledge, now down 20 ft. They came to Oleudale Friday, after scantling to put a track in the incline. The vein pitches at an angle of 45°. It is 2 ft wide, in lime and decomposed granite. One rich streak in it is 3 inches wide, and from this they pounded out 11 ounces and 3 pennyweights of gold from 50 pounds of rock in a hand mortar; this they sent to the mint. They have considerable ore on the dump. Right beside the rich seam is a ledge of talc. The foot and hanging walls are good. This claim is 2 miles above the old town, which in 1868-60 numbered 600 inhabitants, engaged in placer mining; large quantities of gold were taken out and Rochester was a lively camp. Good west coast prospectors might do well to prospect in that locality. A good, enterprising man with a quartz mill could make money there. A great many other ledges have been located in the neighborhood and are being developed. They assay away up.

THE SMELTER.—When the Smelter closed down the other week for want of charcoal, general manager Atkins had the syphon, between the furnace and the outside well, raised—that is, the water-jacket was cut out so that the bullion could flow out at the new or enlarged orifice 1 ft higher than before. This greatly facilitates the discharge. Previously it was necessary to keep the furnace sufficiently hot to form an alloy of the copper matte and speiss with bullion that was fed in for this purpose, thus forcing the lighter metals below the heavier ones; otherwise a crust would gradually form and eventually there would be a "freeze-up." With the amount of lead carried in Hecla ores, some bullion had to be fed in about every 20th charge; now there is no bullion fed and the speiss and matte are drawn off without trouble or danger. Every pulsation of the blast pipe may be seen on the bullion in the top of the syphon. The slag flows out without obstruction. If there was more lead in the ores, the flux would be nearer perfect, but the simple contrivance referred to remedies this drawback. The furnaces are now operating like a charm, and the yield of bullion is very large.

OREGON.

MINING ITEMS.—*Oregonian*, May 1: William Griffin has discovered a promising quartz ledge on Shann creek, in Josephine county, the rock from which looks well. The Grave Creek ditch company has resumed possession of its diggings and employed a number of hands to prospect them thoroughly. The miners of Josephine county are busy, have plenty of water and expect to do well this season, which will no doubt be a protracted one. A gold nugget was taken from the claim of Smyer & Co., at Susanville, Grant county, recently, weighing $260. A $50.25-nugget was also taken from Sam Hillis' claim at Marysville. Gin Lin, the Chinese mining shark, made a clean-up at his diggings near Uniontown this week, from which he obtained about $2,400 in gold dust. This is the result of only a short run, and is evidence that he has some of the best diggings in southern Oregon.

UTAH.

BINGHAM ITEMS.—Salt Lake *Tribune*, May 6: Capts. Davis and Boundy are making preparations to jig their ore. Harry Dunston is working a lease on the Utah; the ore taken out will be concentrated. The snow is rapidly disappearing, and will afford good opportunity for prospecting. The gold belt is looking A No. 1, and the coming summer will astonish the outside world. The Jordan has a large body of gold quartz in sight, and is turning out some fine bullion. Jones & Beemis are working the Bonny Blue Flag on second-class ore for concentration. E. Rawdin & Co. are about starting up concentration works on the Moscow and other dumps. Sam. Eeds has got his concentration works in running order, and intends starting up on the Utah dumps at once. Goodloe is taking out some fine grade ore on the upper works of the Moscow. Dowmott & Hickman are working the west side of the Spanish, taking out considerable ore; all of their second-class ore is being put through the jig. John Cornwall is doing considerable prospecting on the Silver Crown. Ore has been struck that runs from 40 to 75 ounces silver, and an average of 30% lead.

AMERICAN FORK.—The Silver Bell is working five men, Excelsior company eight and the Miller three men. Capps is working the Orphan on Mineral flat. The Dutchman is working four men, and is taking out ore. The Sunday tunnel is being pushed ahead with three shifts. The Queen of the West company are working five men on the Kussler. The Pittsburg mine is said to be under negotiations to the Old Telegraph company at Bingham. The snow in the district is from 8 to 10 ft deep, and developments have been somewhat retarded this winter. The prospects for a good season, however, are very flattering.

BIG COTTONWOOD.—The Colbath tunnel this month has cut a small vein of mineral and ore feeders. The Oregon main shaft is going down as rapidly as full shifts of men can push it, and improves in appearance. The Butte, Prince of Wales, Grizzly, Highland, Evergreen, City of Rocks and other mines all have ore awaiting shipment as soon as the trails are opened. The Cerioca shaft is in a strong vein of iron oxides, lead and silver. Full shifts of men are at work on this property, and the force will be increased as soon as the weather permits.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Grand Prize, May 7th, $23,388; Paradise Valley, May 7th, $3,182; Ivanpah, May 12th, $6,110.80. Stormont S. M. Co., Utah, shipped in January, $48,088.72; in February, $35,346.18; in March, $38,375.67; and in April, $38,105.55. First four months of the year there was shipped from Tuscarora district, $146,644.

Notes on Pacific Coast Fish and Fisheries.

[By W. N. Lockington.]

Gadus macrocephalus—Prohahly the cod of the Alaska cod-fishery is this species. It has a very long barhel and a very large head, with the upper jaw overhanging the lower. The fin-rays ars: D. 14—14—17; A. 19—19. The flanks are spotted.

Gadus auratus, Cope—Has also the upper jaw overhanging the lower, the heard as long as the diametsr of the sye, and the head 3.6 timcs in the total length; hut the dorsal rays are 13, 16, 16, the anal 19, 16, and the color brown upon the sides and ahove, golden yellow upon the lower surfaces and upper jaw. There is also a median angular yellow band upon the first dorsal.

The catch of eodfish in 1879 was rather larger than that of 1878, amounting to ahout 2,000 tons. The trawls used in the Alaska cod-fishery are often 600 fathoms long, and hear on each side a row of hooks at every half-fathom or thereahouts. After they are paid out, they are examined at intervals, and are drawn once or twice a day, according to the rate at which the fish take the bait.

Hippoglossus vulgaris—There is little doubt that the large *Hippoglossus* of this coast, which has three rows of teeth in front of each jaw, is the same as the Atlantic species.

Many Arctic marine animals occur both upon the Atlantic and Pacific coast, as for example, the walrus, the mysticetus and several crustacea, among them *Idotea entomon*. But this species extends southward heyond the Arctic region far into the temperate zone. It is ahundant in Puget sound and as far south as Cape Mendocino, in 40° north latitude, or on ahout the parallel of Naples and Constantinople. Sonth of this point it hecomes scarcer, hut stragglers occasionally occur as far south as the Farallones. It is essentially a deep-water fish, and does not enter land-locked bays like those of Humboldt and Tomales. The only species of flat-fish with which this fish is liable to he confounded is the large flounder known here as the Monterey or Bastard halibut. Large specimens of the latter species equal in size an ordinary *H. vulgaris*, and the form of the hody, and semi-circular arch of the lateral line, are similar. But in the Monterey halibut (*Paralichthys maculosus*, Gir.) the teeth are fewer, and in a single row in hoth jaws; and the coloration, instead of heing invariahly upon the right side, as in the halihut, is rather more frequently upon the left side than on the right.

Individuals taken on this coast rival in size those of the Atlantic. Although the average size varies from 70 to 100 pounds, several brought to this city have weighed from 150 to 180 pounds. One example measured seven feet one inch in length, and weighed 190 pounds after the inside had heen taken out. Another, similarly prepared for market, weighed 220 pounds.

During 1879 two loads, packed in ice, were hrought from Puget sound to San Francisco in a vessel fitted up for the purpose; the trip occupied four days, and the fish arrived in perfectly good condition, hut so large a supply suddenly thrown upon the local market reduced the price to an almost, if not quite, unprofitable rate.

The only previous attempt to hring this fish to the San Francisco market in large quantities was made ahout 20 years ago, when a load of from 20 to 25 tons was hrought in ice from Puget sound. These were "the days of old, the days of gold," when every Californian expected to make a fortune in six months at most. So that when the Captain found he could not ohtain the price he reckoned upon, without further ceremony he pitched the whole cargo into the hay.

When the large size and abundant supply of this important food-fish is considered, it is a matter of wonder that the quantity smoked or canned for the market is so small as it is. The business of preparing smoked halibut is still in its infancy. Halibut is canned hy the North Pacific Canning Company, Klawack, Prince of Wales island, and is of very good quality, hut has not at present met with the favor it merits.

Although a weight of 200 pounds, or thereahouts, is large even for a halihut, Yarrell (British Fishes) states that individuals of 500 pounds weight are occasionally taken in the northern European seas, and one weighing 600 pounds is on record as having been taken on the coast of Maine.

Glyptocephalus pacificus and G. zachirus—The reason that these two species escaped description until I first noticed them in the spring of 1879, is prohahly to be found in the fact that they are hrought from Point Reyes, at which point there was no fishery until ahout three years ago. The latter species—which I believe to he superior in flavor to any other of our flat fishes—was not common at any season, disappeared from the markets ahout August, and is now (March) again making its appsarance. The former species hecame tolerahly abundant at the time of the disappearance of *G. zachirus*, hnt has not occurred, except in isolated individuals, between September and March.

It is probahle that both these species resort to deeper water in the winter season.

The dealers have no special names for these two species, which may be characterized, respectively, as the Short-finned Narrow Flounder and the Long-finned Narrow Flounder.

Zaniolepis latipinnis, Gir.—This is hy no means a common species in ths markets, where it occurs only, so far as I have ohserved, at midsummer. Its yellowish-greeu tint, maculated fins, and extraordinary long second dorsal spine, give it a very peculiar appearance. The length of the second spine varies in different individuals, hut its tip usually reaches, when laid hackwards, the twenty-first or last spine of the dorsal fin.

The only parts of the scales visihle externally are the spinules on their posterior edges, so that the surface of the hody seems covered with prickles, which are felt only when the hand is moved from tail towards hsad, and give the skin a velvety appearance.

The sides of the hody, in a fresh specimen, present two series of orange spots, ranged opposite the spaces hetween the dorsal rays; the upper of these rows is coincident with the lateral line anteriorly, hut above it posteriorly. On the first dorsal are three rows of orange spots, the lower row circular, and placed centrally between the spines—the upper row ohlong, and lying along the hinder side of each spine, the middle row intermediate in character as well as position. On the soft dorsal there are also three rows of orange spots, the middle alternating with the lower.

The anal is hlackish, darkest near the tip of the rays, the free tips of which are white, and the ventrals are similarly colored; but the pectorals are harred and spotted with orange, and the caudal clouded with black and yellow. The head has indistinct orange blotches, and the iris is light golden.

Among some fishes helonging to the State University are about 20 specimeus of a hitherto undescribed species of *Agonoid*, noticeable for its comparatively large size, the curious armature of striated scutes upon its hreast, and the great development of the spines upon the scutes of the hody. Though rather large for the family to which it belongs, it is only about six inches long.

Another character, which, though common to many fishes, distinguishes it at once from its nearest allies, is the projection of the lower jaw beyond the upper. In most of the species the upper jaw projects greatly.

The Agonidæ have their body protected with rows of scutes instead of scales, and the posterior angles of these scutes are often, as in this species, produced into a spine. In this form the scutes of the anterior part of the hody do not coalesce, and the spaces hetween them are filled with an array of small prickles. Parts of the head are set with similar prickles. The head is mnch less spinose than in many of its relations. This interesting form was procured in Drake's hay, at a depth of 10 fathoms by Mr. Voy. A single specimen of the species occurred in the market March 1st aud was promptly secured by Prof. Jordan.

Torpedo californica, Ayres—The museum of the California Academy of Sciences contains only a single small specimen of this species, prohahly the one which formed the type of Ayres' original description. It was therefore with some interest that I lately ohserved in Clay Street market a large example of this species, taken in Tomales hay. I suhjoin a few dimensions:

	Feet.	Inches.
Total length	3	½
Greatest width across pectoral fins, when first measured	2	
Greatest width across pectoral fins, about 24 hours later	2	2½
Width across ventrals	1	1
Longitudinal diameter of eye		½
From front of disk to center of mouth, when closed		2⅜
From front of disk to angle of mouth, when closed		3½
From front of disk to first dorsal	1	11⅜
From front of disk to second dorsal	2	3½
From front of disk to vent	1	9½
Interocular width		3
Width of mouth		3½
Distance hetween the spiracles		2½
Width across caudal fin		8½
Length of hase of first dorsal		2⅜
Hight of first dorsal		4
Length of hasc of second dorsal		1½
Hight of second dorsal		2
Front of disk to eye		2 13-16
Front of disk to anterior edge of spiracles		4
Length of spiracle		1

I am assured by the dealers that this fish attains still larger dimensions, and Mr. Emerick, of this city, tells me that he has seen larger on more northern parts of the coast. The teeth are very small, so that the creature evidently trusts to its electric powers for defense.

Orcynus pacificus, Cooper—This species, the Alalonga or Albicore of the sailors, has occasionally been hrought to market in October and Novemher, at which season it is tolerahly common in Monterey hay.

Clupea mirabilis, Gird—In Novemher and Decemher the herring season is at its hight, constituting prohably the half of the total amount of fish hronght to market. Large quautities are taken in the bay.

Besides the supply of fish taken hy vessels belonging to San Francisco in the hay, and at various points north and south, ranging seaward as far as the Farallones (a group of small, rocky islets about 30 miles from the Golden Gate), a large quantity is sent hy rail from Tomales hay on the north and Monterey hay on the south.

Among the species hrought from the latter locality are several, which either do not occur, or are very rare in Tomales bay. Among these are all the Scomheroids of this part of the coast, namely, *Orcynus pacificus; Sarda chilensis*, the Bonito; *Chriomitra concolor, Scomber colias*, the Spanish mackerel; *Poronotus simillimus*, the Pompino, and *Trachurus symmetricus*, the Horse mackerel; *Sphyræna argentea*, the Barracuda, and *Alosa sapidissima*, the shad.

Ths Scombridæ ahove mentioned, with one exception, are only hrought to market in the autumn (September, Octoher, November). The one exception is the Pompino, of which a limited supply is kept up during the greater part of the year.

Custom Ores.

There came to Eureka a few days ago Mr. I. S. Backus, a capitalist of New York, and Mr. J. T. Gos, a well known smelter and mining man of Utah. Mr. Backus represents a large amount of capital in the East, he, with others, having made a pool of several hundred thousand dollars to put into legitimate mining in the West. Mr. Backus was sent out on behalf of the pool to purchase properties. Coming to Utah, he induced Mr. Goe to join him in the search for something desirable. Mr. Goe is a first-class miner and expert, and it was for this reason that Mr. Backus desired his company. The two traveled all over Utah Territory, hut could find nothiug that suited them. They next went to South Mountain, Silver City, Boise Basin and other points in Idaho with a similar result. They came to the Central Pacific railroad at Winnemucca and had started eastward. Picking up a copy of the *Sentinel* at some place aloog the road containing glowing accounts of the mines and resources of Eureka district, they concluded to switch off at Palisade and take a look for themselves. To say that they were hoth surprised and gratified with the extent and outlook of the mineral resources of Eureka district hardly expresses the favorable opinion formed of this section. Mr. Goe declared that it was the greatest mining camp in the world, and gave it as his opinion that within two years from this date Eureka will he the largest and most permanent mining center on the American continent. He thinks there is a magnificent opening here for custom smelting works and samplers, and these he expressed a determination to provide the present season. Mr. Goe has gone hack to Utah with a view of settling up his business there, intending to bring his family and take up his resideuce in our midst at once. Mr. Goe will he heartily welcomed to Eureka. Enterprisiug mining men, who can command capital, is the great want of the district. The more we get the better. Mr. Backus also determined to make Eureka the scene of extensive mining operations. Having been more than pleased with the general situation, both gentlemen thought it would be as well to return to Salt Lake and await the disappearance of the snow from Prospect mountain. They will put in an appearance here again in about three weeks, when they will mean business. The *Sentinel* guarantees that they will he able to find any number of desirable propertics.—*Eureka Sentinel.*

The Bonanza Mine.

Less than three years ago, McGee, McFarlane & Co., moneyed men residing at Howland Flat, made a loan of $3,000 and took a mine located in the viciuity as security. Time rolled on, the horrowers failed to meet their ohligation, and the capitalists were compelled to get their money out of the mine or do witbout. Repeated efforts to sell the property for 50% helow cost failed, and as a dernier resort the gentlemen decided to develop the claim and make the best of a bad bargain. Work was resumed on a tunnel in the fall of 1878, but the lahor of several months caused the operators to believe that they were wasting money and ceased that task. Meanwhile, the Empire company's property, which adjoined the "Bonanza," had heen worked out and yielded $520,000 net profit from working 400 feet of ground. This faet gave the discouraged gentlemen new hope. They purchased the deserted Empire tunnel and resumed work in making a cross-cut from the end of it into the "Bonanza" ground. Last week, after having expended considerable money in carrying out their plan, and kept a force of men constantly at work for over a year, the "Bonanza" lead of gravel was struck. The first candle-box of dirt taken out cleaned up $182. Five hours work on the dirt taken from the mine, which is worked hy the drift process, resulted in a shipment of $17,000. Late advices from the mine state that the lead grows richer and that the operators are convinced that they have a veritable honanza. They have 2,500 feet of ground to work on, and experienced miners assert that it is if anything far richer than the old Empire was. The affair has created considerahle excitement at Potosi (two miles above Howland Flat) where the mine is situated, prospectors heing actively engaged in locating claims upon every unclaimed foot of land on the ridge. Having regarded their mine as comparatively worthless up to the time that the Empire payed so well, the proprietors of the "Bonanza" are thoroughly and very agreeably surprised.—*Oroville Mercury.*

Mill Music.—The uew quartz mill recently put up hy M. G. Griffith and O. P. Hart, on the Montezuma claim, near Nashville, was started up last week and has ever since been hammering away at a livcly rate on rich ore from that monster ledge. It is a good many years since the Nashvillians have heard that kind of mnsic, and it has infused new spirits into the camp. We predict that it will not he long until the number of stamps now at work will he many times multiplied, and Nashville will he a flourishing mining center.

New Mines at Deep Spring Valley.

The location of rich silver and gold-besring quartz in the region of Deep Spring valley and vicinity, have recently attractsd the attention of not only mining men, but of San Francisco parties who are rspresented on ths ground by their agents and experts. Mr. W. A. Skidmore has just returned from a visit to the nsw district, and from him the Inyo *Independent* gleans the following particulars:

Desp Spring valley is situated in the northern portion of Inyo county, at a point where ths White mountains and Inyo ranges blend, or more accurately speaking, where they lap the valley, which is 6,150 feet above sea level, forming ths dividing basin between the two ranges. Ths valley is about 10 miles long by 5 miles in width, and is surrounded hy mountains having an average hight of 10,000 feet above sea level, over which easy passes and a good wagon road connect it with Owens River valley on the west and Fish Lake valley on the north. The nearest postoffice town is Big Pine, on Owens river, distant 25 miles. The surrounding mountains are ribbed with ledges of quartz carrying average rock varying from $50 to $100 per ton, of which the proportion in gold in value is from one-tenth to one-fifth. Wood for fuel is found in abundance below the snow line, and can be delivered at suitable mill sites for $6 to $7 per cord. Water flows in profusion from springs and creeks on the mountain benches, affordiug mill sites on all sides of the valley. The mineral wealth of this region was known to the pioneer prospectors of the country, hut its developmeut was retarded hy the hostility of the Indians, who found safety in the rugged character of the conntry and its distance from the settlements of the Owens River valley. The early discoveries were confined to the range hordering the northwest side of Deep Spring valley; but the recent discoveries lie on the range flanking the southeast side, and dividing Deep Spring from Eureka valley—the principal loeations being on the slope overlooking Eureka valley, near Soldier pass, a deep cleft in the range connecting the two valleys. This range is composed of micaceous granite flanked ou the Eureka valley side hy porphyritic slate. The principal ledges, known as the Whiteman, Horton, Thanksgiving, Eastern, Western, Southern, Broder and Hedge occur on the line of contact with these formations. The granite hanging country and porphyry foot eountry are sometimes widely divergent—50 to 300 feet—and the intervening space is filled with soft decomposed material in which occur the veins of the district, sometimes on both walls, and again, as in the Whiteman, Horton and Eastern, massive and compact. The ledges, where exposed, are from three to five feet in width coursing northeast and southwest with the general trend of the range and dipping westerly under the granite at a supposed angle of 45°. The characteristic features of the district are the great length of surface exposure of the ledges aud the uniform mineral-hearing character of the quartz. Thns, the series above named may be traced hy outcrop ncarly 10,000 feet with only slight spaces of capping, and where the ledges are exposed showing chimneys 200 to 400 feet in length of high-grade ore. The actnal width of the ledges has not heen determined further than hy the snrface stripping of three to five feet in width. The average of seven assays of high-grade ore from the Whiteman at a depth of three fest gave $251 per ton. The whole body of ore exposed hy stripping a length of 33 feet will give a similar average of $100 per ton. The ores are of the character known as stephanite, and are tractahle to the ordinary mill and pan process without roasting. We understand from Mr. Skidmore that interests in these mines now vest in San Francisco and Sacramento parties, who propose during the coming season active operations in prospecting the new locations.

The Mining Outlook.—There is ahundant evidence on every hand of great, and we believe, profitahle activity. There are at least two score of mines, organized here, nearly ready to announce dividends. We could name nearly one hundred companies who have their new works, smelters and mills, nearly ready to fire up the furnaces or drop their stamps. The snows are melting and the roads will soon he fit for traffic and travel. An abundance of water will soon make the miners' season a busy one. Prospecting is heing organized in a hndred different directions. Nor is this important factor being left any longer to the courageous and energetic, hut often ill-directed efforts of individual and generally ill-equipped prospectors. It is being prepared for hy capital, directed hy knowledge, and to he led hy energy and skill. The carbonate camp is hut a "flyer" hy the side of the enormous activity to he felt in all directions. There are immense quantities of ore awaiting shipment. Railroads are heing constructed or surveyed in many regions. The Gnnnison country is not to secure all the hoom. Utah, New Mexico, Montana and Arizona, southern and western Nevada, and California also, are beginning to feel the impetus the discoveries at Lsadville and the returns already obtained have given to mining in every locality.—*New York Mail.*

The Oregon iron works, Portland, which have been closed for over a ycar, and have hsen in the hands of an assignee, have heen sold, in satisfaction of the mortgage held hy the First National Bank. Smith Bros. & Watson were the purchasers, and the price paid was $15,025.

Recent Decisions Relating to Patents, etc.

We give below brief abstracts of decisions* rendered upon patent cases in litigation, for the benefit of our readers:

DECISIONS OF THE U. S. COURTS.

The Atlantic Giant Powder Co. vs. the Dittmar Powder Co. et al.

U. S. Circuit Court, Southern District of New York.—Decided Mar. 13, 1880; Blatchford, J.:

1. Reissued Patent No. 5,709, granted to the Giant Powder Co. Mar. 17, 1874, sustained, and held to be infringed by the use of a compound containing nitro-glycerine, 07.64 parts; cellulose (paper stock), 16.82 parts; and saltpeter (nitrate of soda), 15.54 parts; and of a compound containing nitro-glycerine, 27.86 parts; saw-dust and charcoal (in nearly equal proportions), 5.59 parts; and saltpeter (nitrate of soda), 66.55 parts.

2. Nothing appearing from the additional evidence introduced to warrant a different finding, the decision in the case of the Atlantic Giant Powder Co. vs. Rand *et al.*, declaring reissued patent No. 5,709 to be for the same invention as original patent No. 78,317 to Julius Bandmann, assignee, to Alfred Noble, May 26, 1868, reiterated.

3. There is nothing in the evidence to show that Noble derived from Dittmar knowledge of the invention described in reissued patent No. 5,709 or in patent No. 78,317, or that Dittmar made any invention that is described in his patent of Jan. 18, 1870, before Noble made the invention contained in reissue No. 5,709.

4. The conduct of the plaintiff and its proceedings heretofore with respect to its litigations and to Dittmar, do not appear to have been such as would deprive the plaintiff of the right to a preliminary injunction against Dittmar and the Dittmar Powder Manufacturing Co., and the same is granted.

There must be a preliminary injunction against Dittmar and the Dittmar Powder Manufacturing Co. as to powders like the samples. The plaintiff does not make out a case for an injunction against any of the other defendants. It does not offer any proof as to any articles made according to the Dittmar patent, and, therefore, it is unnecessary to refer to that patent, and none of the defendants but Dittmar and the company are shown to have been connected with the said samples.

Kirby Bung Mfg. Co. vs. White et al.

U. S. Circuit Court, Eastern District of Missouri.—Decided March term, A. D. 1880; Treat, J.; McCrary, C. J., sitting:

1. An injunction should never be allowed to operate oppressively upon anyone, but be used for the purpose of securing the rights of the complainant in the case pending the litigation without unnecessarily injuring the other party.

2. Under the State laws of Missouri there is but one form of a restraining order. If an injunction is asked for provisionally, it must issue as an injunction *simpliciter*.

3. In the United States circuit courts, restraining orders vary according to the circumstances of the case. Thus, in some cases, patent as well as others, there may be such circumstances as require an injunction *simpliciter*; but ordinarily a bond and order for accounting suffices, and sometimes simply an order for an accounting.

4. For the purposes of a provisional injunction under the patent law, infringement having been proved, two things, or either of two things may exist, to wit, a final decree sustaining and upholding the validity of the patent after full consideration of the matter or proof that the patent went into use undisputed for a sufficient time to raise a *prima facie* case in the complainant's favor.

5. A mere decree entered *pro forma* on the merits is not sufficient of itself to require other United States circuit courts to grant a provisional injunction.

6. On motion for a preliminary injunction, the complainant should set out and describe what the defendant is doing or using that constitutes the infringement charged, in order that the court may determine whether there is such infringement as to warrant the granting of the motion. A general affidavit amounting to no more than a verification of the original bill, will not serve this purpose, being but the opinion of the complainant that the defendant infringes, a fact of which the court should be the judge.

The motion for a provisional injunction is denied.

Christman et al. vs. Rumsey et al.

U. S. Circuit Court, Northern District of New York.—Decided Sept. 10, 1879; Blatchford, J.:

1. Reissue No. 5,804, granted to John Christman, Mar. 24, 1874, for an "improvement in pump-filters," does not contain new matter, and as to the first claim is valid.

2. The decisions of the Commissioner of Patents in granting a reissue that, by reason of an insufficient or defective specification, the original patent is inoperative or invalid, and that such error arose from inadvertance, accident or mistake, and without any fraudulent or deceptive intention, conclusively establishes the fact.

3. When the specification and drawings of the original and reissued patents illustrate and describe the same mechanical structure, with the same mode of operation, the reissue may lawfully contain claims for combinations of fewer elements than were contained in the combination claimed in the original patent.

4. The original patent claimed the entire combination, and the reissue sub-combinations which enter into such general and larger combination: *Held*, that the reissue was for things contained within the apparatus described in the original patent, on the authority of Brown vs. Guild (23 Wall., 18), and Herring vs. Nelson (14 Blatch., 293) as against Gills vs. Wells (22 Wall., 1) and Russell vs. Dodge (3 Otto, 460).

5. Although the second claim of the patent is invalid for want of novelty, the plaintiffs can recover on the first claim, although no disclaimer has been made to the second claim, provided that prior to the entry of a decree as to the first claim a disclaimer is entered as to the second claim that not appearing to have been unreasonable neglect or delay; but he will not be entitled to costs.

This suit is brought on reissued letters patent granted to John Christman Mar. 24, 1874, for an "improvement in pump-filters."

A decree entered for an account of profits and damages and for a perpetual injunction as to the first claim.

Dittmar vs. Rix et al.

U. S. Circuit Court, Southern District of New York.—Decided Mar. 13, 1880; Blatchford, J.:

The use of a process which omits one of the essential parts of that patented, and does not employ a chemical equivalent in its place, is not an infringement.

* More complete reports of the proceedings may be found on file in the office of the MINING AND SCIENTIFIC PRESS Patent Agency, 202 Sansome street, S. F.

PRETTY RICH.—Two of our big gravel mine owners, whom we will call McG—— and P——, were recently bragging of the richness of their respective mines. P—— finally put the clincher thus: "I walked around in these slums," pointing to the liquid mud lying on the bed rock, "for a while the other day, and then walked home half a mile. Before going in the house I stamped most of the mud off my boots. I then washed off what still stuck on and panned it out, finding forty or fifty colors." McG—— was silent.

LOCOMOTIVES run by compressed air have been tested in the Sutro tunnel, and it is believed will prove the most proper kind to use.

HYDRAULIC miners in Nevada county say that the present season will be one of the most profitable they have had for years.

Useful Information.

WOODWORK BURNED BY STEAM.—The *American Manufacturer* says: "At the Crescent Steel Works, in this city, a steam pipe 2½ inches in diameter, carrying from 90 to 100 pounds pressure, was laid under ground about three years ago, encased in common pine boards about one inch thick. A few days since occasion was had to dig up the pipe, and the whole length of the wooden drain was found to be charred and apparently burnt about three-fourths of the thickness of the wood, the other portion being partially rotted. The whole inside of the drain was turned to charcoal, with here and there spots of white ashes, showing that ignition had actually taken place. It seems probable that if the casing had not been excluded from the air by the earth covering it, it would have blazed and been entirely consumed. It is generally believed that a steam pipe cannot set fire to wood, but this case seems to prove the contrary, and it may explain the origin of so many mysterious fires."

TO MAKE FLORIDA WATER.—Here are two formulas for manufacturing that favorite cosmetic, Florida water: (1.) Oil of bergamot, 4 ounces; oil of lemon, 6 ounces; oil of lavender, 1 ounce; oil of cloves, 6 drachms; alcohol (wine measure), 3½ gallons; water (wine measure), 6 pints. The oils and alcohol must be mixed and allowed to stand a day or two, after which the water should be carefully added. (2.) Oil of bergamot, 8 ounces; oil of orange, 4 ounces; oil of lavender, 3 ounces; oil of cloves, 1½ ounces; oil of cinnaman (true), ¼ ounce; tincture of orris, ½ pint; tincture of Peru balsam, ½ pint; alcohol, 4 gallons; water, 6 pints. Mix and let it remain quiet for some days, before filtering and bottling.

A PRESERVATIVE wrapping and packing paper, for protecting clothes, furs, etc., from mildew and insects, is among the recent minor inventions of note. The paper for this purpose is made from woolen and cotton rags, and manilla rope or paper. This is saturated with a mixture of 70 parts by measure of the oil remaining from the distillation of coal-tar naptha by live steam, with 5 parts crude carbolic acid, containing at least 50 per cent. of phenola, 20 parts of thin coal tar, heated to about 160° Fah., and 5 parts of refined petroleum. After saturation, the paper is passed through squeezes, and over hot rollers for the purpose of drying, and when cool, it is cut into sheets of suitable size, and the drying completed in the atmosphere.

BLACK ENAMEL.—If wood is immersed in sulphuric acid it is dyed a jet black, and when dry can be polished by rubbing with a hone spatula; but what would best suit, I think, is the following: Grind up very finely some drop black in water, put the paste in a cup and mix it with a little size or very thin glue, brush the wood over with this, let it dry, sandpaper it and give it another coat, allowing it to dry well, and again apply some worn emery or sandpaper. If well covered you may now use French polish when you will have a brilliant black surface. If it is not a flat surface, brush over with a coat or two of polish varnish, made the same as French polish, only a little thicker.

A LARGE BLOCK OF SANDSTONE.—At the Dark Hollow stone quarry, near Bedford, O., one of the largest stones ever blasted in this country was "lifted" a week or two ago. The stone is 40 by 50 feet square, and about 30 feet thick, and it required 185 slip wedges to make a successful blast. When cut up into pieces it will make nearly 300 carloads of building stone. Immense blocks of stone are frequently taken out of the quarries here which would make the stones in Solomon's Temple mere pebbles in comparison. Its weight was estimated to be about 6,000,000 pounds.

DRAWING ON PHOTOGRAPHS.—Where it is desired to obtain an India ink drawing from a photograph, without resorting to tracing, very nice results are obtained thus: Prepare a print in the usual manner. Instead of toning as usual, fix immediately in "hypo." Wash well in running water to get out all the hypo. Draw directly on the print with India ink. This finished, bleach with a saturated solution of corrosive sublimate (bichloride of mercury) in equal parts of water and alcohol. Flowing is better than brushing, for applying the bleach, as it avoids smearing.

DETECTION OF STARCH IN MILK.—The adulteration of milk by starch can be readily detected by the following method: Add a few drops acetic acid to a small quantity of the suspected milk; boil the milk, and after it has cooled filter the whey. If there is any starch in the milk, a single drop of iodine solution will give a blue tint to the whey. This process is so delicate that it will show the presence of a milligram of starch in a cubic centimeter of whey (1 grain of starch in 2-16 fluid-ounces of whey).

MULTIPLICITY OF PATENTS.—An illustration of the prolific capabilities of our inventors is the fact that over 240 patents appertaining to the art of soldering have been granted.

SALTS OF TIN.—A German technical journal says that salts of tin remove iron stains from linen much more efficiently than oxalic acid will do it.

AN IMMENSE BLOCK OF GRANITE.—What is said to be the largest block of granite ever quarried in the United States has recently been taken from a quarry at Vinalhaven, in Maine. It is 59 feet long, 5½ feet square at base, and 3½ feet square at the top. It weighs from 75 to 100 tons. It cost $1,700 to blast it and move it to the shed where it is to be finished. It is to form the shaft of the monument to Gen. Wool, to be erected at Troy, N. Y.

A WATER-PROOF CEMENT is prepared by a German chemist as follows: Dissolve 5 to 10 parts pure dry gelatine in 100 parts water; then add 10% of a concentrated solution of bichromate of potash. Articles united with this glue are exposed to the light of the sun, when the bichromate becoming reduced, the gelatine film attains great strength and flexibility. Glass ornaments and utensils, when broken, are said to be readily mended by this cement.

PRETTY EXPERIMENT.—If seeds (barley, corn, etc.,) be placed between moist pieces of litmus paper, the roots stick to the paper, and color it so intensely red that even on the back of the paper their course can be traced in red lines on a blue ground. If tincture of litmus be repeatedly added the intensity of the red color is increased.

SILVERED IVORY.—Ivory immersed in a weak solution of chloride of silver in cyanide of potassium, and allowed to remain until it acquires a deep yellow color, and then removed, dipped in water, and exposed to the sunlight, becomes black. Polishing the blackened surface until burnished gives it a silvery appearance.

PAPER THAT WILL WARP.—A new paper is now made of palmetto fiber which can be washed with soap and water, as one would wash a piece of linen cloth, then rubbed, wrung out, and dried. The paper resembles parchment in color. It is not as strong but is tough, although of uneven thickness.

BURRS IN WOOL.—To destroy burrs in wool M. Rene Leblance recommends, first, that the wool be thoroughly dried before it is freed from the grease; second, that the wool be pressed beneath heavy rollers, so that the burrs are crushed, and, third, that the wool be then treated in the usual way.

TO REMOVE blood spots from woolen goods of tender colors, it is proposed to rub them with the inner side of a crust of bread.

Good Health.

Bathing.

Once a week is often enough for a decent white man to wash himself all over, and whether in summer or winter, that ought to be done with soap, warm water and a hog's-hair brush, in a room showing at least 70 degrees *Fahrenheit*. If a man is a pig in his nature, then no amount of washing will keep him clean, inside or out. Such an one needs a bath every time he turns round. He can do nothing neatly.

Baths should be taken early in the morning, for it is then that the system possesses the power of reaction in the highest degree. Any kind of bath is dangerous soon after a meal, or soon after fatiguing exercise. No man or woman should take a bath at the close of the day, unless by the advice of the family physician. Many a man, in attempting to cheat his doctor out of a fee, has cheated himself out of his life; aye, it is done every day.

The safest *mode* of a cold bath is to plunge into a river; the safest *time* is instantly after getting up. The necessary effort of swimming to shore compels a reaction, and the effect is delightful.

The best, safest, cheapest and most universally accessible mode of keeping the surface of the body clean, besides the once-a-week washing, with soap, warm water, and a hog's-hair brush, is as follows:

Soon as you get out of bed in the morning, wash your face, hands, neck and breast; then, into the same basin of water, put both feet at once, for about a minute, rubbing them briskly all the time; then, with the towel, which has been dampened by wiping the face, feet, etc., wipe the whole body well, fast and hard, mouth shut, breast projecting. Let the whole thing be done within five minutes.

At night, when you go to bed, and whenever you get out of bed, during the night, or when you find yourself wakeful or restless, spend from two to five minutes in rubbing your whole body, with your hands, as far as you can reach, in every direction. This has a tendency to preserve that softness and mobility of skin which is essential to the health, and which too frequent washings will always destroy.—*Journal of Health.*

CAUSE OF SNEEZING.—Sneezing is occasioned by a clogging up of the capillaries in the nasal membrane, and a partial obstruction of the nasal passages; in which case a sense of irritation is produced which results in sneezing. This is a sort of crisis which tends to restore the function of the excretory vessels, by relieving them of the congestion.

NEW REMEDY FOR BURNS.—An iron foundry man recommends as "a never-failing speedy remedy" for burns and scalds powdered pine wood charcoal.

ALCOHOLIC ANÆSTHESIA.—In some experiments made by Dr. Hervath, a German physician, in the production of local anæsthesia, he states that if the hand be immersed for a short time in ice water, severe pain is caused, but that no such pain was produced on immersing the hand in cold alcohol, not even when the temperature of the alcohol was as low as 5° cent. Glycerine was found to possess a similar property. Ether caused pain and quicksilver more acute pain still, causing the speedy withdrawal of the finger when plunged into this liquid at a temperature of 3°. It was not ascertained that, on the finger being held for a long time in alcohol having a temperature of 5° cent., no pain was experienced, and, although the finger distinctly perceived the faintest touch, sharp pricks gave no pain. This seemed to show that the application of cold alcohol has the effect of depriving the part of the special sensibility of pain, without, however, impairing the delicacy of the general tactile sensation, which, as is well known, resides in the superficial integument.—*Materia Medica.*

HUNGER.—If a man in good health has not eaten anything for some days, he will die if he eats heartily. When persons are found in an almost starving condition, light food, in small quantities, and at short intervals, is essential to safety. The reason is, that as soon as we begin to feel hungry, the stomach rolls and works about, and continues to do so, unless satisfied, until it is so exhausted that there is scarcely any vital energy; it is literally *almost tired to death*, and, therefore, digestion is performed slowly, and with great difficulty. Hence, when a person is kept from eating several hours beyond his usual time, instead of eating fast and heartily, he should take his food with deliberation, and only half as much as if he had eaten at the regular time. Sudden and severe illness has often resulted from the want of this precaution, and sometimes death has followed.—*Journal of Health.*

DRINKING BLOOD.—It is said that between 200 and 300 men and women of St Louis drink daily from a half to a pint of blood, piping hot from the veins of slaughtered cattle. More blood-drinking by consumptives and aged persons is done in September and October than during the remainder of the year. The blood of young steers is the best, and should be caught as it comes from the animal, and should be drunk while the foam is still on and the steam rising. Consumptives are advised, in addition to drinking the blood to eat in a slaughter-house for a couple of hours each day at killing time to inhale the "steam" of the running blood.

WARTS.—If they give you no special inconvenience, let them alone. But if it is of essential importance to get rid of them, purchase half an ounce of muriatic acid, put it in a broad-bottomed vial, so that it will not easily turn over; take a stick as large as a knitting-needle, dip it into the acid, and touch the top of the wart with whatever of the acid adheres to the stick; then, with the end of the stick, rub the acid into the top of the wart, without allowing the acid to touch the well skin. Do this night and morning, and a safe, painless, and effectual cure is the result.

SHADED STREETS PROMOTIVE OF HEALTH.—All medical writers agree that shaded streets are an essential element to public health; that trees absorb miasma, purify the atmosphere, create currents of air, and produce a refreshing coolness. A tree is never at rest, even in a dead calm. It is always fluttering its foliage, and stirring up the stagnant atmosphere around it. A special fund ought to be granted the department of highways for the planting of trees on all new and principal streets of the city.—*Philadelphia Press.*

FROZEN MEDICINES.—Dr. Edwin Andrew, of New York, finds that many drugs can be given with superior advantage by first freezing them. Anti-septic, astringent, anti-emetic and nauseous medicines come under this heading, and can be combined with ice without difficulty. An especially good feature of this plan is in its affording a possibility of the stomach's retaining medicines which it would reject when given in ordinary ways.

THE FIRST SIGN OF CONSUMPTION.—It is not as extensively known as it ought to be, that, in the large majority of cases, consumption begins with a slight cough in the morning on getting up. After a while it is perceived at night on going to bed; next there is an occasional "coughing spell" some time during the night; by this time there is a difficulty of breathing on any slightly unusual exercise, or in ascending a hill.

THE EFFECT OF IGNORANCE.—A correspondent of the *British Medical Journal* states the diphtheria is raging among the peasant children in Southern Russia. In some localities no child under 12 is to be seen. Filth and ignorance are doing their work. "When a child dies of diphtheria a little cake is put into its mouth and left there a few moments, during which every one present makes the sign of the cross. It is then taken out and administered in tiny morsels to the other children of the family."

EASILY FRACTURED.—The three sons of Z. D. Bowen, of Wadley, Ga., all use crutches. Their bones are so soft and brittle as to often break from even a slight jar. The oldest, Sylvester, has already sustained twenty-six fractures.

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W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
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The Week.

The past week has been one of conflict between winter and summer. For nearly half the time the weather was showery, cold and disagreeable, but the heavens have assumed their wonted clearness again, and a victory for summer is recorded. The rain extended over a greater portion of the State, but was not so heavy in the interior as in San Francisco. In the mountain counties the effect will be to increase the water supply and prolong the season for placer mining, which is receiving more attention this season than for several years past. The spring is indeed an auspicious one for the miner, and an unusually prosperous year is expected.

Business throughout the State is looking up a little, owing to the favorable outlook for both the mining and agricultural interests. The news has at last come that the letter-carrying business of Wells, Fargo & Co., is not to be interfered with by the postoffice department. The Postmaster-General has acted wisely in heeding the unanimous opinion of the press and people of the Pacific coast in regard to this question.

We give in another column the features of the changes proposed for the new mining law, which are much less sweeping than those originally considered.

AGATE INTO ONYX.—Two Germans have patented a process for converting ordinary agate into onyx. Lorenz & Cullman place the cut and polished agates for a week in a solution of iron in nitric acid only one millimeter deep, and then treat those portions of the stone which are to be white with a solution of equal parts of carbonate and hydrate of potash, dried and burned in an earthen pot until the desired color is obtained.

Practices that Call for Correction.

It is much to be feared that a rather loose, if not shamefully, lax state of ethics has come to obtain in the business of manipulating mining properties for sale on this coast. We do not allude now to those more infamous but less prevalent crimes that in some localities have in times past tainted the judiciary, disgraced the bar and tended to subvert the whole machinery of justice. Barratry, bribery, subornation and perjury are offences so gross and intolerable that their too rapid spread tends itself to work their early correction, and which do not, therefore, require to be specially commented upon by the public press. But there grows up sometimes in certain lines of business a school of practice which, though equally violative of the spirit and letter of the law as these more heinous crimes, by reason of its becoming popularized, long escapes both punishment and rebuke. This sort of practice has, we fear, come too much into vogue in the class of transactions mentioned above. We notice in a late issue of the Sonora *Independent* some well-timed strictures on the habits so common among mine owners of misrepresenting the condition and value of properties for which they are desirous of effecting a sale—these remarks having been provoked, as we infer, by some events of the kind recently occurring in that vicinity. But a little amplification of this sort, or even a simple misstatement of facts, are under the circumstances mere peccadillos, so natural and so harmless that they may be excused or at least overlooked. They are not the class of offences we set out to comment upon, and which call for not only public condemnation, but which should meet with speedy repression and exemplary punishment.

To illustrate, we cite what may be considered a case in point. A mine viewer—a man well qualified for the business—having not long since been called upon to examine and report upon a mine in this State, proceeded to do so with his usual care, sampling the ore from all exposed parts of the vein. While taking his dinner the sack containing those samples was by an agent of the mine owners adroitly removed from the buggy where it had been left and another, filled with a better grade of ore, but exactly resembling the sack abstracted, having been prepared for the purpose, substituted in its place. Through this dastardly trick this expert, without any fault of his own, was betrayed into a gross over-estimate of the value of the mine, whereby the subsequent purchasers suffered serious loss.

Again, and still more recently, it is strongly suspected that another and equally well qualified mining expert has been misled in the matter of calculating the value of the ore on which he was experimenting, his mill runs having been salted upon him by some one in the interest of the mine owners. Through the perpetration of this mistrusted fraud a sale of the property, at the time pending, was effected, and now the purchasers have to lament that they paid for it two or three times its real value. Another method adopted for misleading the investing public lies in the practice of publishing portions of the reports of experts, which, separated from their context, convey a false impression of their purpose and meaning as a whole; the authors of these mutilations sometimes going so far as to alter estimates and figures with the evident intention to deceive. It is not long since we saw the estimated depth of a hydraulic gravel bank which the mine viewer had in his report given at 500 feet altered, in what purported to be an extract from that document, to the preposterous depth of 1,500.

Now parties engaged in this sort of thing should remember that they are not only violating the most commonly recognized principles of morality, but that they are making themselves liable to a civil suit for damages as well also as exposing themselves to be proceeded against criminally, and that if persisted in these practices will be very likely to involve them in serious trouble; the reason they have so long escaped their just deserts being the good natured indifference heretofore manifested by the community toward this class of crimes. That parties aggrieved will always prove this lenient is by no means certain, nor is it desirable that these cheats and swindlers should longer escape the just consequences of their disreputable and fraudulent acts.

EVERY man who fancies he can distinguish ore from porphyry who goes to New York, immediately sets up as a mining expert. He has himself interviewed by the mining papers and talks knowingly of shafts and winzes and stopes and hoisting works and stamps and amalgamating pans and formations and gangues and lodes and veins and seams and faults, and manages to make the interviewer think him the man who built the Comstock lode. Some of these experts talk as if they could put ore in a barren mine, or make a granite boulder assay ten thousand dollars a ton. There are mining men in the East who know a mine when they see it; but the majority of the self-constituted experts now spreading themselves in Eastern cities are frauds.

THE May rains will have a tendency to prolong the hydraulic mining season.

Arizona.—No. 3.

Early Towns and Missions.

The Apaches, once the conquering tribe, and the terror of all the more peaceful and more civilized Indians, as well as of the whites, have suffered many mutations; but the Pimas, Maricopas, Papagoes, etc., have been located nearly as they are now for over a hundred years at least, as is proved by an old Spanish map, date 1775, which shows California, Arizona, New Mexico and part of Nevada.

At that date Tucson was the Presidio of Tuquison, and was the most northern settlement of the Spanish crown in North America. To the west of Tuquison no white settlement existed except San Diego. South of Tucson was the still existing though once deserted Tubac, and south of the latter some 30 miles stood Terentes, of which no trace remains. West of this on the Santa Cruz and near the southern spurs of the Santa Ritas, once stood the pueblo of Calabasas, the name of which still clings to a ranch and watering place about eight miles from the Sonora line.

Besides the towns, the Jesuits established three missions for the conversion of the Indians. These were San Xavier del Bac in the Papago district near Tucson, still standing in good preservation; Tumecarori, in the Apache country near Tubac, the ruins of which are still to be seen; and Cowpera, on the boundary line of Mexico. That their missions were attended with some spiritual as well as temporal results is evident from the fact that to this day all the Indians of southern Arizona, Apaches excepted, are good Catholics.

Tucson is said by some to be one of the oldest settlements in the United States, and to antedate New York, while others give the year 1769 as that of its first foundation. It appears to have always been the principal settlement of the region. The Mission San Xavier del Bac is said to have been founded in 1690, but the present edifice was built about 1785. Religious services are still held in it, the building and accessories being kept in repair. The walls are profusely decorated with sacred paintings, and as it is but a pleasant carriage drive from Tucson, it has become quite a resort for pleasure seekers as well as the curious.

Tubac, now again awakening to life, was once a flourishing pueblo of the King of Spain.

An Old Document.

The conditions under which the poor inhabitants were compelled to live while under Spanish rule, are well set forth in a document found 25 years ago in the archives of Tucson. This document is the report and complaint of Manuel Baragua and two others, in the name of the entire community of Tubac, to the Capitan of the province. It states that Tubac is between two mountains six leagues apart, in a valley which has much fertile land suitable for wheat or corn, but without enough water for the latter unless the water of Tumecarori be distributed every alternate week to supply the need. After speaking of the abundance of cottonwood and willow in the valley and of pine upon the Santa Ritas, six leagues away, the complainants allude to the mineral riches.

In the vicinity of Aribac (Arivaca), about seven leagues away, are, they say, many mines of very rich metals, three in particular, one of which yields a silver mark for one arroba (25 lbs) of ore; the second, six marks from a load (100 lbs); the third a little less. Three leagues beyond this, in the valley of Bobocomori, they allege the existence of fine gold placers, known to the whole community of Tubac, who went to view it; and in the Santa Ritas five silver mines are spoken of.

Then comes the complaint: The silver mines are known, but cannot be worked because of the Apaches, who live there and continually pass to and fro to the hot springs four leagues away. Daily having more violence (thus runs the tenor of the complaint) from the enemy because of the few troops we have, we desired to break up our homes and sell our effects; but as you imposed heavy penalties on us if we did so, we obeyed your order. Last month the Apaches finished off our entire herd of horses and cattle, destroyed the fields and carried away all the corn they could. Since the fort was removed to Tucson, the town of Calabasas has been burned. Also, a few days since, the Apaches came from the west, and for three days grazed around, taking corn from our fields and taking off those they found there, and we momentarily expect them to serve us and our families as they have served our property. The petition concludes with an earnest prayer for pity and help—for troops to protect homes, flocks and herds.

At last, after blocking up their doors and windows with mud bricks for defence, the inhabitants fled to Tucson. But a bold individual named Smith, held his ranch in spite of all the efforts of Cochise, the Chiricahua chief, who, after Superintendent Wrightson, of the Tyndall mines, had been slain in the mountains where he had ventured against the advice of Smith, one day surrounded the latter's house with 20 Indians. But Smith was a match for them. A brave Mexican woman, whom he afterwards married, loaded his rifles, while he, from the loop-holed window, picked off all who dared show themselves, and at last, the Indians—what were left of them—were forced to retire.

In 1817, Dionisio Rohles, of Rayon, with 200 men, fought his way through hostile tribes for 70 leagues to the Santa Ritas, but was obliged to return with the loss of many men, and without finding any single mass of the pure silver, although they took home good store of treasure.

Old arastras and the ruins of rude, but effective smelting works still remain to prove the wide-awake ways of the old padres.

Cession from Mexico.

The portion of Arizona north of the Gila was ceded to the United States in 1848, but there was some misunderstanding between the two governments, in consequence of which the portion south of the Gila was acquired by purchase from Mexico in 1854, for $10,000,000. The Mexican government, displeased at this, banished Santa Ana, who had negotiated the sale. Arizona remained a portion of New Mexico until 1863, when it was constituted a territory.

Thus for five years after the discovery of gold in California, southern Arizona belonged to Mexico, and this, together with the almost complete absence of military protection during the civil war, coupled with the fierce enmity of the Apaches, accounts for the postponement of the settlement of Arizona until very recently.

When the Rebellion broke out the only Federal troops in Arizona shamefully abandoned it, to the number of 450. One hundred Texan guerrillas took possession of Tucson, and most of the inhabitants fled to Sonora, or stood ready to join the rebels.

J. Ross Browne, in his "Adventures in the Apache Country," says: "The few citizens and traders who remained loyal to the Government, and the managers and workmen employed at the mines, being thus left at the mercy of lawless desperadoes, roving bands of Apachee and Sonoranians, fled from the country as fast as they could procure the means of escape. Many of them were imprisoned, and some were murdered." The hostile Indians followed small parties and slaughtered them, and boasted and believed that they had conquered the American nation. The Sonoranians ransacked mines, stole machinery, and murdered the few employees left.

Tubac, the headquarters of the Arizona mining company, was held for 3 days by 20 men against besieging Apaches on one side and Sonoranians on the other. The Confederate troops burned all the stores, provisions and groceries, public and private, tore down the mill at Tucson, and destroyed everything they could lay hands upon. Nothing remained of Union rule until 1863, when it was re-established. Except a few American miners in the Cerbat and Hualapai mountains, and a ranch or two on the Salt river, a few Mexicans were all there was left.

The whites, to use the expression of Gen. Rosecrans, were on the reservations, the country belonged to the Indians. But at last Gen. Crook cleared the mountains of the Apaches, and their fugitive bands were gathered together upon the White Mountain reservation, where, with the exception of occasional renegades, the bulk of the tribe now remains.

Placer County Mines.

The Hidden Treasure drifting mine at Sunny South has just been sold to an English company—the price understood to have been paid being $245,000.

Breece & Wheeler's claim—the Paragon mine—at Bath, is working over 40 men in the drifts. It is reported that this mine is also soon to be sold to an English company—the price it is said being $300,000.

The above two noted mines are among the richest in California and have made large fortunes for their respective owners. In both the whole mass of gravel, from the surface down, contains gold, while that portion immediately overlying the bedrock is extremely rich in coarse channel gold. As an illustration of the latter, some time since in Breece & Wheeler's claim a timber was removed which rested on the gravel lying in a depression of the bedrock. This dirt was then washed and yielded $800, principally in large nuggets.

Pond's ditch, 60 feet of which went into Breece & Wheeler's pit in one of the recent slides, has been repaired by a flume around the break.

At the Newcastle hydraulic mine, near Pino, a fatal accident occurred last Monday, the 10th instant. This mine has just been opened, and the water was turned on and piping commenced, for the first time, on that day. A cave of the bank occurred, which caught two men before they could escape. One of them, named Burns, was instantly killed; the other was very seriously injured. The deceased leaves a wife to whom he was married only a week previous.

The Chicago mining company are sinking a shaft on their ledge near Penryn. On the 100 level they have drifted off 50 feet on the ledge each way from the shaft, and are now sinking the latter to the 200 level, in order to thoroughly prospect the ore body. The ledge is three feet thick and the ore uniform in character wherever opened, prospecting excellently.

The Alahama company at Penryn have their shaft down 150 feet, doing prospecting work only. The ledge is from three to four feet thick, and similar in character and prospects to that of the Chicago company.

THE latest mining excitement in Montana is in the direction of Horse Plains, at a point near the head of Thompson river, and about 100 miles from Missoula. The camp is called Maginnis Gulch.

Scientifio Discipline.

Nothing is more nnfounded than the lofty contempt which is yst manifested in certain qnarters towards subjects recommended for thoir practical ntility. There is yet lurking in most communities a certain caste whioh pridss itself in its idiotic opposition to the claime which acientific knowledge is forcing npon the attention of mankind generally. That such ie ths case can be owing only to a lack of sound jndgment, cansed by erroneous systems of education, whioh deal largely in fancies and cschew facts. But, happily, in the matter of education ths old order is being inverted, which exalted mere words at ths exponse of things, and wo are now bringing the resources of modern induction to bear in the process of mental disciplino. Sciance is fighting ite way holdly and fearlessly, depending not upon mere opinion, but romaining as fixed as the relation of man to the surrounding world. Its proper study fills up a void occasioned by the old etercotyped means of education. This deficiency mauifeste itself more in the lack of judgment than in any apparent weaknees of the other faculties. To bo convinced of this serious drawhick in sonnd mental development it is only necessary to observe society at large—so unconscious is it of any remedy for this defect that it almost ignores tbe condition or accepts it as a necessary fact. The wide-spread ignorance of tho methods and facts of scieuce, the prevalence of popnlar superstition and empiricism not only nmong the masses, but also in the higher and more cultivated classes, ovince a sad neglect of those fnndsmental laws which have been found hy experience to govern the conrse of things, so that a vast majority of poreone appear to be turned into the world uttsrly dcfenceless, and a prey to evente which thsy might control. We are suffering to-day from adulterations of food and drink, but we cannot look for relief to legislators, or to an enlightened public opinion, so long as the still-born learning of our high-pressure literary teachiug continues to usurp the place of n rational scientific training for an intelligent contemplation of ths world—of man and his requirements and interests. A striking illnstration of the lack of judgment in evsryday matters occnrred recently in Ohio. A vendor of "improved" lightning rode did an immense business in the sals of a rod, which was set on the roofs of buildings without metallic or other connection with the earth, except the material of the building itself. It was not until a man in Iown began to raise doubts as to ths ntility of the "new invention" that the imposition was discovered. The matter was brought into the courts, where the testimony of experts clearly demonstrated the article to bs entirely worthless for the purpose for which it was so highly recommended. Many church committees hnd already invested in the sham, and the school board of Cincinnati had it placed on some of the school buildings. Such delusions will continue while the knowledge of physical science is neglected or confined to mere book-learning, instead of personal acquaintance with the facts and necessary truths of nature. The discipline afforded by a course of training based on the natural sciences, is the very best preparation for every department of human activity; nnd this alone is capable of enabling man to successfully meet the problems and difficulties presented by the ever varying phenomena which paeses before his eyes.

Ons of the results of a sonnd mental training ought to be the power of distinguishing between what is real and what is artificial, what is permanent and what is transitory; how to deduce the unknown from the known in the interpretation of nature. If the old regime fails to give this power it is well that we face the fact. The popular panics, excitements, violent public agitations and delusions which periodically possess whole masses of the people, educated and uneducated, indicate a sad want of judgment, and habits of logical thought, which can only be remedied by a rigid drill on man's relation to the necessary laws, forces and objects of nature. No one can reasonably object to the stndy of the natural sciences on the score of want of dignity in the ideas which they unfold, or the exactness and practical value of the knowledge and discipline they impart. The critical assaults and expreseions of distrust of our colleges and their systems of education, has led to many changes of late in favor of a more liberal culture in the physical sciences in conformity to the spirit of the times, and the urgent demands of modern progress.

Repointing Circular Saw Teeth.

Sometimes a circular saw tooth will strike a spike or a atone, or a knot and its sharp point he broken off. Instead of filing all the other teeth down to the length of this short one, it is best to lengthen the short one hy "swagging" or upsetting with a crotched steel tool, raising the swage in the act of upsetting. By this means the tooth point will be bronght from the condition ehown in Fig. 1 to that in Fig. 2 of the accompanying engravings.

One hundred bath-houses are being built on the beach near the railroad depot at Monterey, and the breakwater will be constructed immediately.

Testing Boiler Iron.

We witnessed this week, at the office of C. C. Bemis, U. S. Inspector of Steam Vessels a trial of ths Fairbanks testing scales, which is made especially for testing har and boiler iron. The capacity of the apparatue is 75,000 pounds, and is the only one of tho kiud on the coast.

The device works on the same principle as an ordinary platform scalo of the Fairbanke pattern, as far as the levers, etc. are concerned, the whole being nnusually heavy and strong. Tho upper chuck or grip is secured to a heavy iron arch, and ths lower one is secured to a cross-head having a powerful screw at each end, theso screws being rotated by gears so arranged that it takes 5,000 turns of the crank to draw the screws down one inch.

A picce of iron of specifiod dimensions is placed in the chncks, whero it is gripped by wedges having their inner faces corrugated and flat, and their outer faces smooth and rounding. Ae strain is brought to bear by tbe screws being drawn down, these wedges adjust thsmselves automatically so as to grip the bar on all parts equally.

The operator in turning the crank draws down the cross-head and lower ohuck by means of the gear nnd screws; nnd while the upper chuck remains stationary; great tensile strain is thue brought on the iron.

There are two beams, one having a weight or poise, which is placed at the point snpposed to he near the capacity of the iron. The other smaller weight or poise is on the emaller beam, is automatic, and is nrranged to slide along the beam. A cord running through a slot in the beam passes over a pulley at the end and has a weight nttached to it, the other end being connected to the sliding poise. As the strain on the iron operates the levers and the beam begins to rise, the pawl is released from the cord and the sliding poise moves along, registering the strain. If it reaches a position on the beam equal to the strain on the iron, the bsam drops and the pawl engages with the cord, stopping the movement of the poise. The poise, therefors, registere the strain as it gradually increases, The instant the fiber of the iron breaks the poise stops, as there is then only a lighter strain, which could not move ths poise. The mechanism is very delicate and accurate. Mr. Fairbanks, of the famous firm of scale makers, was present at the trial the other day, as was his partner on this coast, Mr. Hutchinson. A nnmber of gentlemen interested in the iron business in this city were also pressnt. Pieces of boiler iron, etc., were tested very satisfactorily for tensile strain. We shall on another occasion give a more complete description of the ingeniously contrived scale.

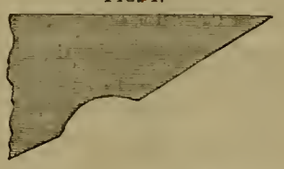

FIG. 1.

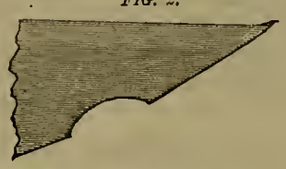

FIG. 2.

LENGTHENING CIRCULAR SAW TEETH.

File Holders.

To reach the center of large flat surfaces, ae printing press beds, etc., it ia necessary to hold the file in a special way. The eimplsst method is to heat and bend the tong as shown in Fig. 1 of the accompanying engravings. A better way, and one which does not necessitate rebending of the tong, is to have a "holder" such as that shown in Fig. 2. Thia receives the straight unbent tong and may be subetituted for the regulnr handle, or replaced by it in less than a minuts.

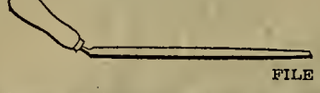

FIG. 1.

FIG. 2.

FILE HOLDERS.

Encyclopedia of Industrial Arts.—Parts 10 and 11 of Spon'a Encyclopdia of Industrial Arts maintain the high standard for practical and useful information which we have claimed for the earlier issues of the series. Part 10 has an elaborate article on candles, which shows the latest improved machinery used in this importnnt branch of manufactures. It contains also good articles on carbou, carbon bisulphide, catgut, cements, clays, etc. Part 11 has an exhaustive essay on the coal-tar prodncts, numerous and important as they are generally known to be. It also has comprehensive treatment on cocoa nnd coffee. The Encyclopedia is being brought out in parts of about 60 pages each, by E. & F. N. Spon, of Broome street, New York city.

The receipts for duties at the Custom-House in San Francisco, for the week were $94,954, making a total since January 1st of $1,955,276

Gold in Black Sand.

Nearly all of the heavy black sands of the auriferous districts of this State contain more or less gold, and in a few localities they also contain platinum and iridium. At a nnmber of points along the coast of both California and Oregon, where the surf has concentratsd and sspsrated these eands, they have been worked and although not altogether succcssfully, it was owing to the limited quantity of the eand available and imperfect and costly working. Where the Frne concentrator has been usod the sands have been worked with considerable profit.

This black sand is a varying mixture of minute particles of magnetite, iron and copper pyrites, or sulphurets, togethor with small qnantities of other unimportant minerals. The gold found in it is in part bright and clean, microscopic in size usually, but often large enough to be visible to the unassisted eye; most of it however, especially in the deep blue gravel mines, is what is called *rusty*, *coated*, or *black* gold. The exact natnre and cause of this peculiarity ie not fully understood. The gold seems to be covered with a film of some mineral, possibly arsenic or antimony, which prevents amalgamation. Still another form of occurrence which is quite common and important is where a small particle of gold is attached to or enclosed by a small fragment of pyrites. The larger part of the rusty gold is of thie description. The sand, hy assay, contains gold in value all the way from $10 to $1,000 a ton, even when unconcentrated.

In many of the hydraulic mines the hsavier black sand, which is caught in the riffles, is now saved and sold to metallurgical works, but it is obvious that at the present time by far the larger proportion of this sand passes through the sluices and undercurrents, and is practically lost in the immense mass of the comparatively barren tailinge which fill the canyons of the larger monntain streams. With it much gold is lost, especially coated gold. Col. Wilson the superintendent of the Pemberton mine nt Forest hill, has during the past winter been experimenting on the separation and concentration of these sands and the extraction of the gold they contain. Quite satisfactory and successful results have heen obtained, and in one of the late tests a little over one ounce of fine gold wae extracted from about a pint of concentrated sand. This sand, under the microscope, was seen to contain some bright gold, but more coated gold. After roasting the sand no difficulty was found in amalgamating the gold it contained. The writer, a year or two since, took thirty pounds of sand, and, grinding it with quicksilver in a large mortar, into which a stream of water was constantly flowing, obtained $50 at an outlay of $5. The sand wns taken from the tail sluice boxes and concentrated in a rocker from an original weight of 150 pounds.

Owing to the lnrge volume of water used in washing gravel and the high velocity with which it runs through the sluices, it is necessarily somewhat difficult to effect a perfect separation of the sand from the barren tailings and at the same time so concentrate it as to render it easily handled. In some claims an additional undercurrent is put near the end of the boxes for this purpose. Where the quantity of sand is large and its value high it might be practicable to use blankets. The sands thus caught can be further concentrated by mechanical consntrators. The snbsequent treatment by roasting and amalgamation, and chlorination presents no especial difficultice.

Justice Annual Meeting.—At the annual election of the stockholdere of the Justice mining company (Nevada), held on the 10th inst., 91,000 shares being represented, the following named gentlemen were elected to serve as a Board of Trustees during the ensuing year: J. P. Cavallier, George T. Marye, H. M. Levy, H. A. Unruh and W. Ayer. Mr. Cavallier was elected President; Mr. Marye, Vice-President, and R. E. Kelly, Secretary. Superintendent Curtis presented hie report, showing the tracing of the body of base ore in the mine from the 1300 to the 1650-foot level, but not containing a sufficient quantity to pay for extraction. All work was being done through the Alta shaft, which would make the expense of working the Justice mine the ensuing year very light. The Secretary's report showed receipts for the year amounting to $355,076 96; expenditures, $353,343 23, including $68,765.60 of old indebtedness. The present liabilities of the company are $25,112.51; cash in office and bank, $1,733.73.

Photographing Animals in Motion.

The wonders which the camera has wrought in the service of science and industry are far greater, in point of general interest and value, than its work as a delineator of humau form or features. At first the camera labored in the field of personality; afterward it entered the arena of ideas and became a demonstrator of truths of high value. The astronomer measures his observations of many celestial pheuomena upon the negative. The student of medical science pursues his most intricate examinations in pathology with the aid of photographs of magnified sections of nervous and muscular tissues. And descending to lower lines of scientific research and to the practices of useful arts, we find the camera entering nearly all of them, not only as a faithful servant, but many times as a master, pointing the way to the truth in science and the successful in practice. A most interesting volume could be writtsu upon the achievements of the photographer in the aid of human progress.

These somswhat trite remarks are suggested by the recent succeses of Mr. E. J. Muybridge, of this city, in hie elaborate efforts to produce faithful photographic analyses of the methods of motion in animals. He has succeded in catching movements which the eye is powerless to detect, because of their rapidity of execution, and the result is that many ideas based upon the faulty evidence of the sense of sight, although long held, must be replaced by others. We have, upon several former occasions, spoken of Mr. Muybridge's success in photographing animale in motion at Gov. Stanford's ranch at Menlo Park, but the leading steps of his process will hear rehearsal. There wae erected upon one eide of the driving track a long building for the cameras. These camerae are 24 in number, and are placed in the building in a row, one foot from each other. Each of the cameras is numbered. On the fence forming the backgrouud to the track are nnmbers, one foot apart, running from one up to twenty-four. From each of these numbers, and, therefore, one foot apart, pack-thread is stretched across the track in the direction of the camera opposite. Each thread is connected with a spring, which, when set, breaks the circuit of electricity in a system of wires running to shutters in front of each camera. The shutters are so arranged that upon closing the electric circnit, by the breaking of the threads, they fall down a certain distance, but in their fall expose the lense of the camera for about one five-thousandth part of a second. This, however, is sufficient to give a perfect photograph of the horse in the position he is in at the instant each of the shutter's fall. Thus the pace of the horse is photographed in every foot of the distance covered by the cameras. The 24 pictures thus made give every position taken in making a stride.

The latest demonstration of Mr. Muybridge's snccessful effort was shown at receptions given by him at his studio in this city during last week. His latest improvements include not only the secnring of accurate plates giving all the parts of the stride, but he has achieved a triumph in presenting these parts upon a screen in such a way that they enter iuto each other, and present a picture of progressive motion. It only differs from the motion of nature in that it is slower, and thue the eye is enabled to catch all its component parts. He has combiued the different photographic plates so that with the aid of the magic lantern and the zoogyroscope the picture of a moving animal is projected npon a screen.

Of the effect of this arrangement as shown by Mr. Muybridge in his preliminary exhibition a reporter of the *Call* eays: The spectator seee moving across the canvas horses trotting, running, jumping, or whatever gait they may take. As an animal moves along, the movement of every limb, of the head and tail are seen. The pictures are made to move much slower than the natural gait of the animals represented, thus allowing the spectator to follow every motion of the legs. The horse was presentsd in the attitude of running, trotting and lesping. In one picture a horse ran in one direction and another trotted in the opposite direction, and the animals appeared to pass each other on the canvas. One of the most successful was the horse jumping a hurdle. Here the animal, ridden by a jockey, came on a run from the right of the canvas, and leaped a hurdle near the other side. Following him came others, and a succession of leaping horses swept across the screen. Another very beautiful and very successful photograph was that of the greyhound running. Every different motion could be plainly seen, beginning with his leap into the air, the drawing of his legs together before alighting, and his return to the ground again. A furious bull dashed across the canvas, and every motion, including the terrifying motion of the tail, wae accurately given. A man running was also shown.

The experiments made by Mr. Muybridge show that the gensrally received opinions as to many positions taken by horses are uttsrly wrong. It has been thought that in running a horse left the grounnd on the hind feet. The photograph shows that he leaves it from one fore foot. This showe why running horsea break down sooner than trotters. In trotting it ie seen that the horse is off the ground a portion of the time. In the cass of Clay, one of Mr. Stanford's trottere, during a etride of 17 feet, the animal is off the ground alt gether fully nine feet. These experiments also show that the heel etrikee the ground first, and not the toe, as generally received.

Candelaria District.

We take the following items of interest from a letter to the Bodie *Free Press:*

The great drawhack to the town at present is lumher and water; hut notwithstanding this, there is considerahle huilding going on, some 14 stores and small dwellings being in course of construction, and many more are contemplated when the necessary material arrives, which is now heing delayed on the road by storms. There are now here 3 groceries, 2 harher shops, 13 saloons, 3 variety stores, 1 dry goods and furniture store, 2 restaurants, 1 news depot, 1 brewery, 2 clothing stores.

As to the mines, there is not a very great deal of work heing done at present, though, if indications amount to anything, prospecting will he very lively during the coming season, and from the looks of the "croppings" the prospector should reap rich rewards. The Northern Belle is shipping considerahle hullion, and the Mount Diahlo will follow suit at no distant day. The Holmes company are erecting a new huilding, the Black Metallic is pushing work, as are also the East Mount Diahlo, Monnt Potosi, Victor, Beauregard, and a number of others. Altogether, the mining outlook in this district will average with that of any like district in Nevada, and the prospects of Candelaria, taking everything into consideration, are very hright, and I predict that before the summer is over the district will he much more generally known than at present. Poor water is six cents a gallon; poorer water, five cents a gallon; one dollar per night to sleep on the floor; one dollar and a half to sleep in hed—if you can get it.

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SUB-IRRIGATION.

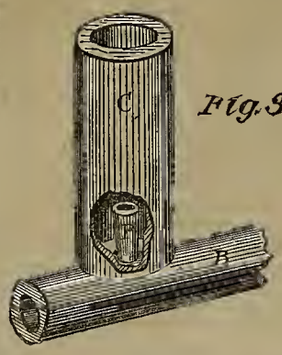

Fig. 3.

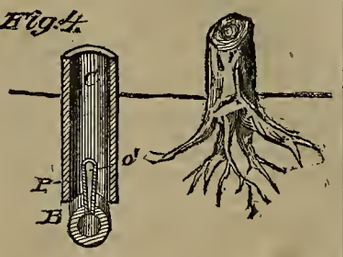

Fig. 4.

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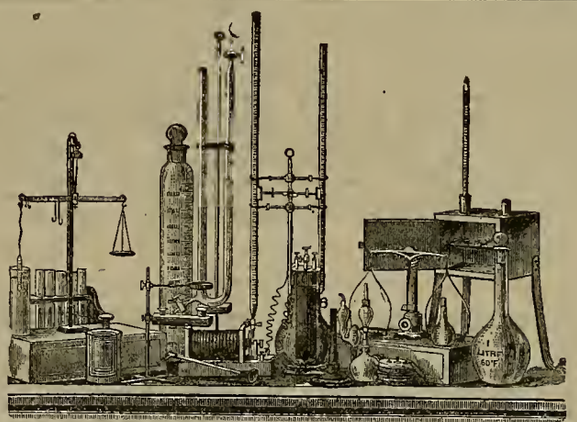

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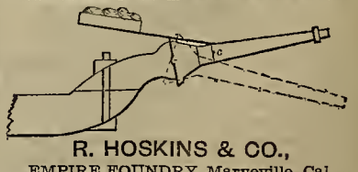

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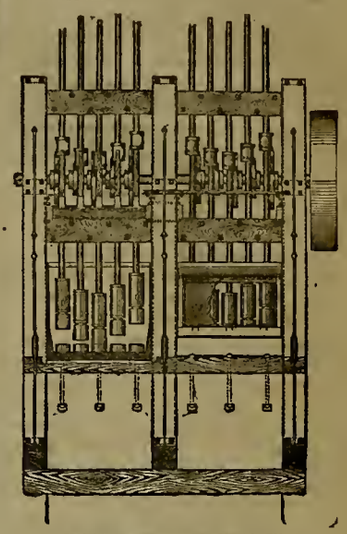

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING MAY 4TH, 1880.

227,090.—VEHICLE SPRING—G. Aechenauer, Sacramento Cal.

227,273.—FIRE BOX FOR BOILERS—J. Mailer, S. F.

227,283.—MACHINE FOR FILLING CANS WITH MEAT, FISH, ETC.—A. H. Moore, Ellensburg, Orn.

227,179.—KITCHEN CABINET—I. B. Robbins, Stockton, Cal.

227,189.—ORE STAMP MILL—J. M. Thompson, S. F.

227,142.—TUBE FOR SURFACE CONDENSERS—C. B. White, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

MACHINE FOR MAKING METALLIC LATHS.—Charles H. Carter, of San Francisco. Patented April 27, 1880. No. 226,901. This machine consists in a series of rocking bending jaws, operated by proper mechanism, in combination with a mandrel. A sheet of metal of suitable dimensions is laid upon the mandrel or former. The eccentrics, as the shaft is rotated, force the sliding plates down, thus forcing down the oppositely placed arms or levers. These arms or levers force down the upper edges of the swing presser plates, the lower beveled or sharpened edges of which squeeze the overlapping edges of the metal plates from which the laths are formed down over the rounded edges of the former and into the crevice on each side, thus forming the lath. The eccentrics again raise the swinging plates and separate their lower edges, releasing the lath, which may be drawn out through the opening at the end of the machine, after which a new piece of metal may be inserted and pressed. Mr. Carter was awarded the inventor's gold medal at the fourteenth industrial exhibition of the Mechanics' Institute, 1879, upon this invention.

KITCHEN-CABINET.—Isaiah B. Robbins, Stockton, Cal. Patented May 4, 1880. No. 227,179. This device relates to certain improvements in kitchen-cabinets; and consists in certain details of construction and combination of parts, whereby the cabinet is enabled to hold flour and meal of different kinds, a rolling-board, rolling-pin, etc., all of which may be inclosed, and when ready for use the front drops down and slides out in a peculiar manner, so as to furnish a table on which bread may be mixed. When the cabinet is open and the leaves unfolded and drawn forward on the slides, said leaves form a table on which the bread-board is placed. The bins are all open in front of the person at the table, and the drawer also is within convenient reach. All the appliances for making bread, pies, etc., are at hand immediately in front. When the operation is over the bread-board may be put back in its slides, the draw closed, the leaves folded over and pushed back, and the front and cover closed, the whole being thus shut up out of the way and inclosed from the dust.

WASHING MACHINE.—J. Frellocher and F. Mahler, S. F. Patented April 27, 1880. No. 226,909. This invention relates to certain improvements in that class of washing machines in which the clothes to be cleaned are passed between rollers; and the improvements consist in providing a pair of circumferentially grooved or corrugated rollers, which are given both a rotary and endwise reciprocating rubbing motion by peculiar mechanism, operated by a foot-treadle, in combination with peculiar dogs or lugs provided with a swinging arm, by means of which the direction of rotation of the rollers is controlled, the dogs or lugs being provided with adjustable bolts, by which the feed of the rollers is regulated. The rubbing action of the rollers is such that the clothes are washed in a manner similar to the operation when performed by hand, while at the same time no injury is done to them, the rollers being mounted on elastic bearings. This machine is simple in operation and very effective, performing its office very much in the manner as if the clothes were washed and scrubbed by the hand.

BOLT HEADING AND POINTING MACHINE.—Alfred Magunson, S. F. Patented March 30, 1880. No. 226,090. This invention relates to certain improvements in machinery for forming complete bolts; and it consists in a mechanism whereby the bolt is headed in a manner similar to that now in use, and in addition it is cut off and pointed at the same operation. This device may be applied to the Lewis Bolt Header, in which a head is formed upon a rod of iron after heating. The rod is then cut off by another operation to the proper length, and the bolt so found is finally pointed by a third and independent operation. By this invention these three operations are performed as one, and the product is greatly increased thereby. It will be manifest that spikes, track rails and bolts of any shape either square or round may be made by this machine.

MACHINE FOR FILLING CANS WITH MEAT, FISH, ETC.—Asher H. Moore, Ellensburg, Curry Co., Oregon. Patented, May 4, 1880. No. 227,283. The object of this invention is to provide a means for mechanically filling the cans in which such articles as fish, meat and other substance not of a liquid nature are hermetically sealed and preserved, and put upon the market. Usually the fish, meat or similar articles to be preserved, after being cut up or put in the shape in which it is to be preserved, is placed in the can by hand. It is not always possible to completely fill the can in this way, no special pressure being applied, and, moreover, considerable time is consumed. The means which is employed by this device to facilitate the operation of filling the cans are such that the meat, fish, or other article, after being cut up in suitable-sized pieces and being placed in a hopper, is forced or fed by a plunger into a mold corresponding in size to the can. A knife then cuts off the mass, and another plunger forces the meat or fish from the mold into the can, which is then removed and sealed, the whole operation being automatically performed. This apparatus can be worked as slowly or rapidly as desired, it being expected that its speed will be regulated so as to keep one man busily engaged placing and removing cans, thus filling the cans very rapidly, and each one will contain the same weight of fish and meat.

AIR COMPRESSOR AND WATER LIFTER.—L. B. Lawrence and W. P. Hammon, of Oakland, Cal., and A. G. Strawbridge, of Sharon, Pa. Patented April 27, 1880. No. 226,918. This apparatus relates to certain improvements for raising water, in which the heat and pressure of a body of steam is employed to act upon a body of air within a tank or reservoir without the intervention of a piston or other mechanism, so that said air is compressed and expanded at the same time, and serves as a medium by which to transmit the pressure to a distant tank, from which water is to be raised to any desired point. This is accomplished automatically by the aid of certain mechanism, consisting, first, of an automatically-acting supply and exhaust-valve and a condensing-jet actuated by a valve. The invention further consists in an automatically steam-valve-operating device, whereby the water of condensation may be withdrawn from the air tank and employed to move the valve, and at the same time it may be used in its partially-heated condition to feed the boiler.

PREPARATION FOR COATING INGOT-MOLDS.—Augustus L. Simondi, Silver City, Idaho. Patented April 27, 1880. No. 226,933. In the casting of bars or ingots of gold and silver it is desirable to make clean, smooth and solid castings; but it is very difficult to do so. Various methods have been employed for this purpose, the principal being to coat the mold with oil or with the soot of resin or other smoky substance. When oil is employed it burns off rapidly and dries up, not having sufficient body, while the loosely attached soot is easily carried away in the pouring, thus leaving the iron of the mold exposed as before. This invention consists in the application of a compound to the interior of the mold, said compound being of such a nature and consistence that it will form a coating or film between the molten metal and the iron mold, and prevent the adhesion of air and the formation of blow holes, or other undesirable appearances.

VEHICLE AXLE.—Wyman C. Partlow, Oakland, Cal. Patented April 13, 1880. No. 226,454. This invention relates to certain improvements in the construction of wagon or carriage axles; and it consists in a novel construction and combination of parts whereby dust-proof cups are provided at each end of the spindle. The spindle which receives the wheel is made of iron somewhat smaller than the box within which it is to run. Upon this spindle two sleeves are shrunk, which extend toward the center of the spindle from each end, leaving space between them, so that the axle-box will turn upon and be supported by the sleeves, which is smaller and serves to retain a fibrous substance, which is saturated with oil or other lubricant. These sleeves are chilled or hardened so that the axle while having all the toughness of iron will also be provided with a perfectly hard surface for the purpose of the journal.

PIPE AND PLUMBERS' STOCK.—We refer those in need of iron pipe and plumbers' stock to the advertisement of Richards & Snow in another column. The establishment at 406 and 408 Market St., is an old and well-known one; the proprietary firm having, however, been recently changed by the retirement of Mr. Barker, and the accession of Mr. Richards to his interest. All the parties are of good business repute, and their trade in the items mentioned in their advertisement is large.

THE Superior Tribunal Justice of the Federal District of Mexico has asked that trials by jury be suspended, on account of the acquittal of several criminals lately.

The Land Troubles in Tulare County.

According to dispatches to the daily papers of Wednesday morning, the trouble between the settlers and the railway company in the Mussel Slough country, has resulted in bloodshed. A dispatch to the *Call* says:

United States Marshal Pool and W. H. Clark, the land grader, arrived at Hanford Tuesday morning to dispossess the settlers, and left Hanford at half-past seven to serve process on William Broden and others. The Leaguers collected and followed the Marshal, and overtook him three miles north of Grangeville, and commanded him and the grader to surrender, which they did. They then commanded Crow, a purchaser from the railroad company, and a companion named Hartt to surrender. Instead of surrendering, they leaped from a spring wagon and fired with a shotgun and rifle, killing James Harris, Iver Kuntson and John Hendarson, and wounding Archie McGregor, William Broden, D. Kelley and a man named Haymaker, all being settlers. The settlers returned the fire, wounding Hartt fatally, and as Crow retreated at some distance, a shot struck him, killing him instantly. There is great excitement at Hanford and vicinity, but the leaders of the League caution prudence.

This trouble has been anticipated some little time. On Monday it was reported that several parties, supposed either to be in league with the Railroad company or opposed to the interests of the settlers, had received anonymous warning to leave the country. Among those said to have been thus forewarned were M. D. Hartt and Walter J. Crow, who were looked upon as tools of the Railroad company, and who, in consideration of their service in dispossessing the settlers and thereby providing a test case, were to receive their land. Members of the League deny having sent these warnings to Crow and others. United States Marshal Poole and W. H. Clark, grader of railroad lands in the Mussel Slough region, arrived at Hanford Monday night, and took rooms at the hotel. Early on Tuesday morning they drove out of town in a buggy.

The presence of the Marshal becoming known after his having dispossessed one settler, squads of mounted men followed the Marshal and party. When they met the affray occurred which resulted in the deaths enumerated above. With regard to future proceedings, Marshal Poole says that he does not know what he shall next do in the matter. He will lay the matter before the authorities, but he does not see that they are in a position to help him. In the first place, there is no money to meet any expense of the Marshal's department, and in the next, Congress recently passed an act forbidding the employment of United States troops to enforce any civil process. The unfortunate difficulty is much to be deplored, and the rights of the case will only come out when a calm investigation is made.

The "Californian" for June.

The June number of the *Californian*, the new monthly magazine, is now out, and is an exceedingly interesting issue. There is great variety in its contents and two new departments—"Art and Artists" and "Books Received"—are added. The low price of this magazine places it within the reach of all—only three dollars a year—while each number contains matter to interest every member of the family. It is published at 202 Sansome street, San Francisco, where subscriptions may be forwarded. We copy the table of contents.

The Interoceanic Canal and Geographical Congress.....Ferdinand de Lesseps.
A Practical View of the Indian Problem....Guy Howard Shoshonee.....Joaquin Miller
Sand. Chapter VI.....J. W. Gally
The Hawaiian Islands.....J. M. Davidson
The Nemesis of Fraud.....M. Howland
A Summer in the Saddle.....Charles H. Shinn
The Nest in the Oak.....S. E Anderson
Notable Autographs—II.....Pourquoi
Carmelita.....Mary W. Glascock
A Cycle.....Milicent W. Shinn
Shelley and the Revolution.....Josiah Royce
A Duel in the Backwoods of Alabama.....James Wilton
The Unchosen in the Market-place....Margaret A. Brooks
Our Schools.....Henry M Fiske
A Visit to the Samoan or Crocodile Caves..E. W. Pailhet
NOTE BOOK.—The Clock Strikes One. Immorality in Literature. The Recent Tragedy. President-making. Weed or Flower. Beauty as a Commodity. Personality in Literature. The Elections in England.
SCIENCE AND INDUSTRY.—Prof. Davidson on the Warfare of Science. Artificial Diamonds. Intellect in Brutes. Electric Induction. Improvements in Silk Culture. A Fossil Ferment. The Destruction of Insect Pests.
ART AND ARTISTS.—The Artists' League. The American Renaissance. Art Criticisms.
OUTCROPPINGS.—St. Mary's. Rote. The Highest Peak of the Rocky Mountains. Hypatia and Bishop Cyril. Chinese Literature. Just the One. A. Fahle. Blighted.

Resources of Arizona.

In another column we give the third of a series of articles on Arizona, which have been compiled for the PRESS in order to give our readers as full and reliable information concerning that growing Territory as is at present attainable. As we have had to use the testimony of other writers, we can only say we have sought to give our readers the best at command. We intend soon to send a special correspondent to this new and important field, and to furnish every detail concerning the different mining districts and the material resources of the Territory which it is possible to procure. Our correspondent will visit the principal mining fields in Arizona and collect such statistics and details as are available. What we now give is somewhat general in its character. So great an interest is manifested in all that relates to the Territory, and especially its mining resources, that we shall spare no trouble to gather and publish such information concerning it as will be of value to our readers.

News in Brief.

A SMALL steam propeller has been put on Mono lake.

THE grain crop of Russia is seriously threatened by beetles.

THE land troubles in Mussel Slough, Tulare county, still continue.

THE Apaches are still giving trouble in Arizona and New Mexico.

THE U. S. Geological Survey took the field from Eureka, May 5th.

THE tobacco fly is devastating the tobacco plantations of Virginia.

RAINS and frosts have caused great damage to crops and vines in Spain.

THERE is great excitement in Cuba over a new insurgent conspiracy.

A PECULIAR and fatal disease is killing the sheep at Chestnut, Montana.

AN effort is being made to manufacture silk in Salt Lake on a small scale.

A SWEDISH colony, numbering 800, will come to eastern Oregon this summer.

BEDS of young oysters have been discovered at the Terrace Baths in Alameda.

THE surveyor of the James single track railroad has begun work at Antioch.

FOR the first time in 58 years it is now legal to smoke on the streets of Boston.

REPORTS from southern Oregon predict a bountiful harvest the coming season.

IT is estimated that 5,000 acres will cover the entire loss by flood in Colusa county.

MINISTER ANGELL will probably leave San Francisco for China on the 10th of June.

THIRTEEN fishermen lost their lives at the mouth of the Columbia river during the recent gale.

THE track of the Southern Pacific railroad is now laid nine miles east of Pantano, Arizona Territory.

M. COMADANOSE, a well-digger, was killed by noxious gases in a well in San Joaquin county, April 29th.

EIGHTEEN persons were killed or wounded by the explosion of a dynamite magazine at Faido, Switzerland.

THE new Normal School building at San Jose is to be constructed of granite and brick, and is to cost $130,000.

PHILADELPHIA proposes to save $150,000 a year by having its streets cleaned by the inmates of its House of Correction.

RUSSIA proposes to transfer her Embassy from Pekin to Shanghai, on account of the excitement at the former place.

PART of the roof of the St. Gothard tunnel, 6,300 meters from the south entrance, fell last week, killing three workmen.

THE Nicaraguan government has granted liberal concessions to the American Government for an Inter-oceanic Ship Canal Co.

THE phylloxera has appeared in the vineyards near Naples and Messina, and other parts of Italy, where it was before unknown.

CHONG HOW, late Chinese Ambassador to Russia, and contractor of the treaty of Lavodia, is to be decapitated, his sentence having been approved by the Empress.

BATANGO, an African village on Cameroone river, west coast of Africa, was bombarded and burned by the British, on account of the capture and ill-treatment of British subjects by the natives.

AMERICAN citizens in Peru claim, through the United States Government, indemnity from Chile for all losses and damages whatsoever they have suffered or may hereafter suffer through acts of the Chilean forces.

THE Society of California Pioneers intend erecting a fine new building with a frontage of 80 feet and a depth of 190 on the southwest corner of Fourth and Market streets, San Francisco, some time the present year. The expense of building the edifice is set at $100,000.

By Universal Accord,

AYER'S CATHARTIC PILLS are the best of all purgatives for family use. They are the product of long, laborious and successful chemical investigation, and their extensive use, by physicians in their practice, and by all civilized nations, proves them the best and most effectual purgative Pill that medical science can devise. Being purely vegetable, no harm can arise from their use. In intrinsic value and curative powers no other Pills can be compared with them, and every person, knowing their virtues, will employ them, when needed. They keep the system in perfect order, and maintain in healthy action the whole machinery of life. Mild, searching and effectual, they are specially adapted to the needs of the digestive apparatus, derangements of which they prevent and cure, if timely taken. They are the best and safest physic to employ for children and weakened constitutions, where a mild but effectual cathartic is required.

FOR SALE BY ALL DEALERS.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Chew JACKSON'S BEST Sweet Navy Tobacco.

A Cheap Home Among the Orange Groves.

There is now for sale one of the finest locations adjoining the town of San Gabriel, seven and one-half acres of choice land; two-story frame house (partly unfinished), within one mile of postoffice and railroad station. Near church and school. One acre of oranges just in bearing. Peach, apple, almond, nectarine and pomegranate, also in bearing. Corner lot. Reference, RURAL PRESS office. address SETH MOSELY, proprietor, San Gabriel, Cal. [1]

METALS.

[WHOLESALE.]

WEDNESDAY M., May 12, 1880.

IRON.—	
American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	— @35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 5½
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 16
Plow Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	— @— —
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	6 @— 6½
Bar	— @— 6½
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck " "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.—	
10x14 I O Charcoal	— @10 50
10x14 I O Coke	10 00 @10 00
Banca Tin	— @25 00
Australian	— @20 00
I. O. Charcoal, Roofing 14x20	— @10 00
" " " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft, 7 to 10, lb. less than cask	10½@— 11
NAILS.—	
Assorted sizes	6 50@8 75

Meteorological Summary for the Month of April, 1880.

Station, San Francisco, Cal.

Date	Mean Daily Barom.	Daily Mean Temp.	Daily Mean Humid'y.	Prevailing Direction of Wind.	Daily Rainfall.
1	29.838	54.50	92.0	SW	.25
2	29.805	55.25	83.3	SW	1.85
8	30.034	53.50	84.7	SW	.12
4	30.154	53.75	79.0	S	....
5	30.033	56.75	77.0	E	.05
6	30.216	52.25	83 3	W	.59
7	30.176	55.50	82.3	W	....
8	30.109	56.25	83.7	NW	....
9	30.110	54.75	89.0	SW	.77
10	30.215	52.50	74.0	W	....
11	30.178	53.25	75.7	SE	....
12	30.040	52.00	75.3	SW	.11
13	30.151	50.25	67.7	W	.07
14	30.059	51.00	70.0	SW	.59
15	29.895	51.75	84.7	SW	1.33
16	29.898	50.50	68.0	SW	.27
17	30.029	47.00	70.0	W	.06
18	30.230	48.25	61.7	W	.09
19	30 042	52.50	70.3	SE	.48
20	29.769	55.50	85.0	S	1.81
21	29.831	53.50	78.3	SW	1 39
22	30.102	52.00	73.0	W	.23
23	30.250	53.00	71.3	NW	....
24	30.175	53.50	75.7	W	....
25	30.145	52.00	76.7	W	....
26	30.120	53.00	78.8	W	....
27	30.031	51.75	87.0	SW	....
28	29.994	53.50	84.7	W	....
29	30.064	52.50	84.7	SW	....
30	30.160	52.25	83.7	W	....
Sums	901.841	1,584.00	2,368.1	....	10.06
Means	30.001	52.80	78.94	SW	....

NELSON OGROM, Serg't Signal Corps, U. S. A.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Mining and Other Companies.

Pereons intereeted in incorporated eharee will do well to recommend the publication of the official noticee of their companiee in thie paper, as the cheapeet appropriate medium for the eame.

Atlanta Mining Company.—Location of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 29th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Secy.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, May 21st, 1880, and day of sale to Wednesday, June 23d, 1880. By order of the Board of Directors. A. F. McGREW, Secy.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Fifth day of May, 1880, an assessment (No. 42) of 20 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of June, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the Fourteenth day of July, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California

Palmer Ice and Refrigerating Company.—Location of principal place of business, San Francisco, California. Location of works, 224 Fremont street, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of April, 1880, an assessment (No. 2) of 25 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 303 Montgomery street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the 24th day of May, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 17th day of June, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. O. O. PALMER, Secretary.

Office—No. 303 Montgomery St., San Francisco, Cal.

ANNUAL MEETING.

OFFICE OF THE

Pioneer Consolidated Mining Company,

A meeting of the stockholders of the Pioneer Consolidated Mining Company for the election of a Board of Trustees to serve for the ensuing year and for the transaction of such other business as may come before the meeting, will be held on MONDAY, the Twenty-Fourth day of May, 1880, at 2 o'clock P. M., of that day, at the office of the Company, Room 4, 300 California street, San Francisco California. Transfer books will be closed on Friday, the Twenty-First day of May, 1880, at 3 o'clock P. M.

J. M. BUFFINGTON, Secretary.

Office—Room 4, 309 California street, San Francisco California.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

San Francisco, May 1st, 1880.

At a meeting of the Board of Directors of the above named Company held this day,

Dividend No. 15 of Seventy-five Cents (75c)

Per share was declared, payable on Wednesday, May 12th, 1880, at the office in this city or at the Agency of the Nevada Bank of San Francisco in New York.

WM. WILLIS, Secretary.

Office—Room No. 20, Nevada Block, No. 300 Montgomery Street, San Francisco, Cal.

Improved Grounds For Sale

NEAR SAN JOSE.

The subscriber offers for sale a tract of land, 40 acres in extent, located half a mile south of the road from San Jose to Alum Rock, and four miles from San Jose—directly in the warm belt of the foothills. The grounds are pleasantly and conveniently located, and under a high state of cultivation.

Five Acres in Orchard,

— CONSISTING OF —

Orange, Lemon and Lime Trees, Nuts,

FIGS, ETC.,

Together with a great variety of other Fruits, large and small, and GRAPES. TWO ACRES are set off for an

ORNAMENTAL GARDEN,

Which is now filled with Shrubs, Flowers and a fine growth of ORNAMENTAL TREES, 170 in number, now 11 years old. In connection with these grounds there is now a

Small Cottage and Farm House,

Well built and hard finished. On the higher ground there is a

FISH POND,

40 by 80 feet in extent, and 8 feet deep, well stocked with Carp. The pond is supplied with water from a never-failing spring a few feet distant, which delivers 24,000 gallons of water every 24 hours the year round. The pond is at an elevation of 20 feet above the house, and from it pipes are laid for irrigating the orchard and garden, and supplying the house.

Forty-three acres additional will be sold if desired, making a total of 83 acres.

This place affords a rare opportunity for anyone desirous of securing a well improved locality for an elegant country residence, and will be sold at a great bargain. For further information apply either at this office or of the proprietor on the premises.

C. FIELDSTED.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

Manufactory, 17 & 19 Fremont St., S. F.

EVERY FOOT WARRANTED.

BELTING AND PACKING.

EXTRA QUALITY ENDLESS BELTS,
STEAM AND SUCTION HOSE,
AIR, OIL AND BREWERS' HOSE,
CAR SPRINGS, VALVES, GASKETS, Etc.

All Kinds of Rubber Goods Made to Order at a Few Hours' Notice.

RUBBER FACTORY

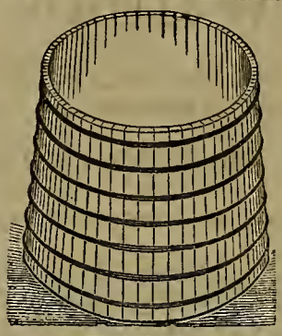
ON THE PREMISES.

Goodyear Rubber Co.,

R. H. PEASE, Jr., } Agents.
S. M. RUNYON, }

Nos. 577 and 579 Market St., San Francisco.

MECHANICS' MILLS.



OUR WELL KNOWN

WATER TANKS,

Made by machinery, constantly on hand and made to order. PAN STAVES, WOOD PULLIES and OAK GUIDES a specialty.

WELLS, RUSSELL & CO.,
Mechanics' Mills, corner Mission and Fremont street.

Entirely different from other Saws. When dull, sharp teeth, which only cost a trifle, can be inserted in a few minutes, without taking the saw off of the mandrel, and no skill is required in doing it. Send for Catalogue showing their vast superiority. More of them are being sold than of any other kind, and we are altering all other kinds to the Chisel Tooth.

TATUM & BOWEN,

329 Market Street, 3 Fremont Street

Engraving. Superior Wood and Metal Engraving, Electrotyping and Stereotyping done at the office of the MINING AND SCIENTIFIC PRESS, San Francisco, at favorable rates.

W. T. GARRATT'S

BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings

Hooker's Patent Celebrated

STEAM PUMP

☞ The Best and Most Durable in use. Also, a variety of other

PUMPS

For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF

IRON PIPE AND MALLEABLE IRON FITTINGS.

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES.

A. S. HALLIDIE.

Office, No. 6 California Street,

SAN FRANCISCO.

Manufacturer and dealer in all kinds of

Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire

Of all sizes on hand or made to order.

Barbed Fence Wire.

Sole Proprietor of

Hallidie's Endless Ropeway,

For the Transportation of Ores, Etc.

☞ Send for a Circular.

A. S. HALLIDIE.

Office, No. 6 California St., San Francisco.

LOVELY SEA SHELLS.

California Sea Shells and Mosses.

I will send to any address collections of Sea Shells in 10, 20, 30 and 50-cent packages. Also, collections of most exquisite Sea Mosses for pressing and making wreaths and crosses for framing. Price, 25 cents per box Stamps taken. Address FLORENCE PERCY, Cordero Valley, San Diego County, Cal.

THE SCIENCE RECORD for six months and our cloth covered newspaper fileholder and binder, for one dollar.

LEFFEL'S IMPROVED WATER WHEEL.

PRICES REDUCED!

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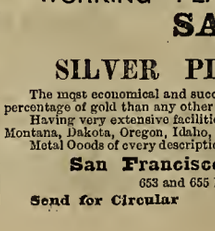

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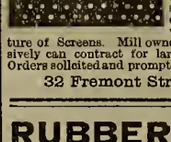

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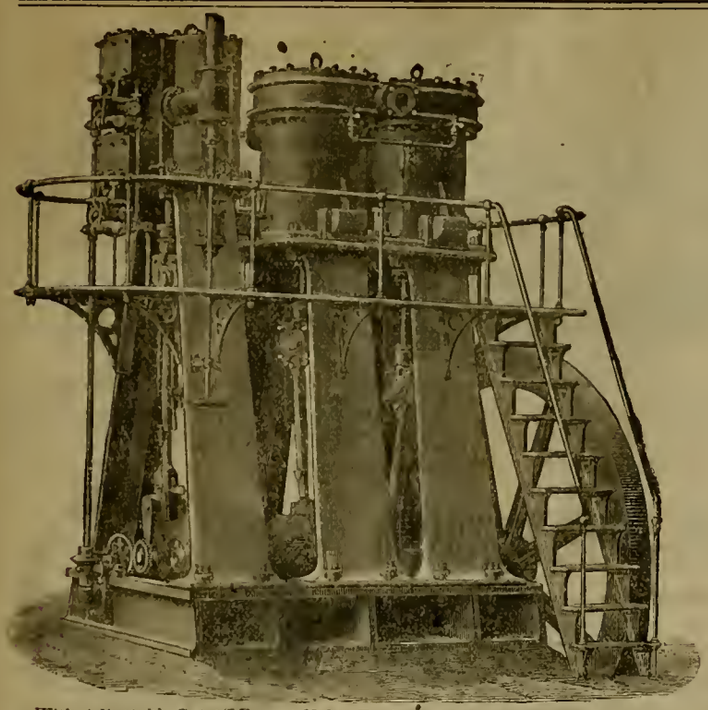

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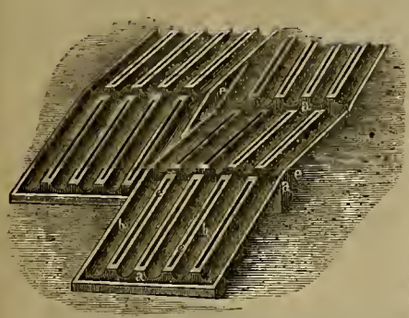

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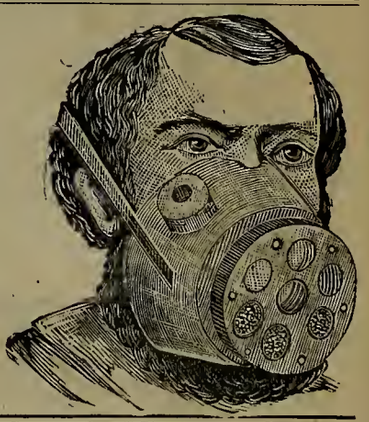

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An Illustrated Journal of Mining, Popular Science and General News.

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SAN FRANCISCO, SATURDAY, MAY 22, 1880.

VOLUME XL Number 21.

Chlorination Vats for Gold Ores.

We take from the new edition of "Roasting of Gold and Silver Ores," by Guido Kustel, engravings of two forms of vats used in the chlorioatioo of gold ore in sulphurets.

After the ore has been properly roasted, it must be moisteoed before iotroduced into the chlorioating vat. The sulphorets, if dry, form a more condcosed mass than in a certain damp conditioo, and are, therefore, more obstructive to the ascendiog gas; besides, the chlorino does not attack the dry ore as vigorously as when it is damp. It is, therefore, indispensable to moisten the sulphurets after they are sufficiently cool. For this purpose the roasted charge, or several tons, are spread on the floor and water sprinkled over it by means of a hose, or otherwise, and turned over several times till it appears uoiformly wetted. The moistened charge should oot create the slightest dust, and at the same time the hand should remain dry on handling it. A handful of it pressed hard together must form a lump, which cao be held with the fingers, but falls into its former loose condition if handled. This moisteued ore always contains some lumps formed in the furoace; sometimes it may happen that a nail or screw is charged with the ore. Iron is very injurious, if in the ore during the chlorination, and the lumps would not chloridize properly. For this reason, siftiog of the moistened ore is necessary. The separation of lumps and other impurities is not the only reason why siftiog should be done. The more chlorine gas that can be introduced into the ore-hox or vat, the surer will the chlorinatiou of the gold he effected; it is, therefore, important to sift the ore directly into the vat in order to have it therein in as loose a condition as possible, leaving more space between the ore particles for the chlorine gas. The sieve, about 8 meshes to the running inch, is 12 to 14 inches by 25 in the clear, the sides 5 ioches high.

The chlorination vat, into which the ore is sifted, by pushing the sieve to and fro, either on two scantlings laid over the rim of the vat or suspended on four ropes, is 7 to 10 feet in diameter, capable of holding 4 to 6 tons. These vats, or square boxes, are provided with false bottoms, in order to permit leaching and to allow the gas to expand below the whole mass of ore, and to ascend through the ore uniformly at all points. The arrangement of the filter bottom can be fixed in the same way in a vat; if preferred a cotton cloth can be used for a filter, but it is more expensive than a gravel filter, the cloth being soon destroyed by the chlorine. In case cloth is used, it is necessary to lay staves across over the cloth 4 inches apart, so that when the tailings are taken out by means of shovels, the cloth should not be reached and displaced.

Fig. 1 represents a tub filled with ore on a gravel bottom. Over the filter bottom, which is perforated with inch holes (or direct on the bottom of the tub), is spread, first a layer of clean quartz, 1½ to 2 inches square. In default of quartz, another kind of rock or gravel will answer the purpose, except lime rock, which absorbs a great deal of chlorine. Over the coarse layer smaller pieces are laid, and so on, decreasing in size till a layer of sand covers the whole, forming thus a filter of from 4 to 5 inches in thickness. This filter remains always in the vat; the shoveling out of the residue, therefore, must be done carefully on approaching the filter bottom. There are two holes communicating with the space below the filter bottom. One is for the reception of the lead pipe, *d*, or better, a rubber hose, by which the chlorine is introduced; the other, *c*, is provided with a hose for the discharge of the lixiviation. This side of the tub stands half an inch lower than at *d*.

To prevent the absorption of the gold solution by the wood, it is necessary either to keep the vat filled with salt brine for several days, to fill up the pores of the wood, or to coat the inside of the vat with asphaltum varnish, or a mixture of pitch and tar or oil. The pitch mixture must be applied while hot; the asphaltum varnish is preferable, as it penetrates the pores more perfectly than the pitch. In either case, however, after a long use, when the vat should be discarded, the staves should be burned and the ashes assayed for gold.

The moistened ore is then sifted into the vat, within about 6 inches of the rim, as soon as the drawing, leveled carefully, without pressing. The wooden cover, *a*, is laid upon the rim, after a piece of cloth, *b*, has been tacked to the side of the vat near the water-pipe, *l*, to prevent the jet of water disturbing the surface of the ore. The pipes, *i* and *l*, before the hose is used, must be closed with stoppers, also the hose, *e*. It is better, in place of the pipe, *l*, to have only a hole into which the hose is inserted, when the water is needed. The chlorine gas can be admitted now into the impregnating vat.

At Melrose, 6 square boxes, 6 by 5 feet, prepared on journals, admitted a very convenient and quick discharge.

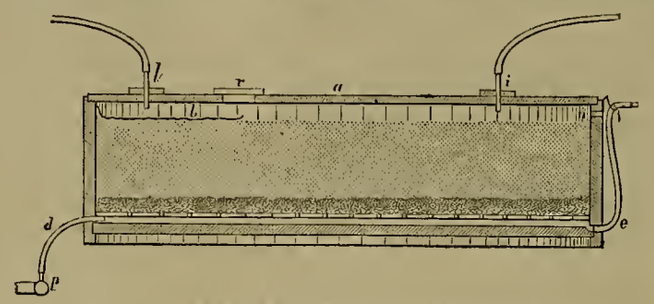

FIG. 1. GRAVEL BOTTOM CHLORINATION VAT.

Fig. 2 shows a vat that was planned by E. Riotte, for chlorination works in Japan. Vats of a similar shape were also used in Germany to chloridize the sand in the river Rhine. It is a deep vat, but since the roasted sulphurets filter always very readily, a column of sulphurets 4 or 5 feet deep still permits a good leaching. The vat measures 4 feet on top and 2 feet at the filter bottom, and is 5 feet deep. This arrangement has the great advantage of taking up less room, and having comparatively a much smaller filtering surface, the more convenient cotton cloth can be laid over the false bottom, which is perforated. But also a gravel filter between the bottom and perforated partition can be prepared, as described in Fig 1, which does not get out of order by being turned over. The gas is admitted through the lead pipe, *a*, provided with a cock, by which the pipe is closed, after the required amount of gas is passed into the tub. The same pipe, with another hose attached, serves for the discharge of the lixivium. The cover is represented in the drawing, after O. Hofmann's design. This arrangement makes the cover perfectly air-tight. After the joint on the periphery has been carfully luted with a good plastic clay, also around the two pipes, the whole cover is then covered with water about one inch deep. The clay, under water, of course cannot crack, and this is an advantage, especially then, if before leaching it was found at one of the pipes, that no surplus chlorine gas is in the tub, and a second charge of gas is required. Roasting of Gold and Silver Ores is for sale by Dewey & Co., 202 Saosome street, San Francisco, for $3 per copy.

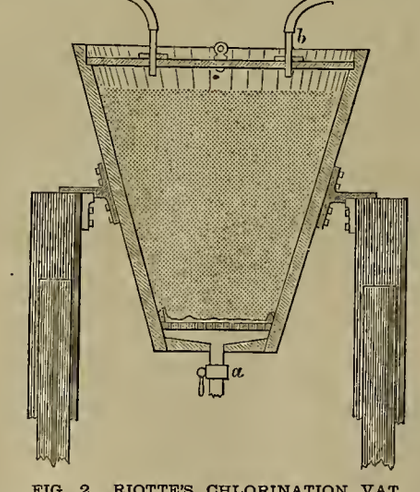

FIG. 2. RIOTTE'S CHLORINATION VAT.

The surface indications go to show that it is a true extension of the Idaho ledge, and as such is a valuable location. Mr. Dorsey was one of the original owners of the Idaho, and from an investment of $50 realized $45,000 in dividends; he has, therefore, considerable faith in that kind of a ledge in that place. The other directors are Jno. C. Coleman, Edward Coleman, Stephen Moore and Samuel Bethell. The new company have run a tunnel in 650 feet on the Maryland, and the drifts are 325 feet on the vein; found it to be the same vein, the quartz being identical. The top rock is not expected to produce anything, or until water level is reached, as were the case in the other mine which finally proved so rich. Steam hoisting works will be put up this season, and a shaft sunk upon the vein. The Maryland, in view of its position, is considered one of the most promising mines of the section. The original owners in the Maryland were the original owners of the Idaho mine, which produced nearly $6,000,000, of which $2,700,000 was distributed in dividends.

THE MARYLAND MINE.—We had the pleasure this week of meeting Mr. Samuel P. Dorsey, an old resident of Grass Valley and one of the gentlemen interested in the Maryland mining company, recently incorporated. The Maryland adjoins the famous Idaho mine on the east.

WATER, pure and free from alkali, has been struck at Red Rock, Arizona, between Picacho and Desert station, at a depth of 280 feet.

AN Italian expedition to the south pole is projected. Two winters will be passed in the Antarctic regions.

Geology and Human Development.

A writer in the *Victorian Review* asks the question, "Will the Anglo-Australian race degenerate?" He produces data and facts of a very interesting nature, which strongly indicate an answer in the affirmative. Observations seem to show that as is the geological development of a country such is the biological development of the animal life by which it is inhabited. That the human race has obtained its highest development in those regions where the soil had undergone its latest elaboration at the hands of nature. The main differences between the northern and southern branches of the Aryan race, who settled in Europe, is attributed to the influence of soil. The latest geologic formations are found in South Europe, Greece, France, Italy, Spain; also in England. Not so in Northern Europe, Australia and Russia. In the latter, large areas belong to the transition and secondary periods; while in Persia, Georgia and Circassia, where nature has carried her inorganic work to greater perfection, we find that here the human race attains its highest beauty and nobility. Note the contrast between Bohemia and the North country, as compared with the German or the average Greek; the Dane and Swede as compared with the Lapp and Finn; the Chinese south of Pekin and those in the north, around Lake Baikal. In Hindostan those tribes which inhabit a primitive region look like lower animals, while in the peninsula, in the same latitude, in the neighborhood of Bombay, we encounter one of the noblest and most beautiful types in the world—in soil of later or modern formation. The types referred to are permanent, because faces and figures cast in precisely the same mold are to be seen sculptured on the walls of the temples of Elephanta.

This parallelism between biological and geological development is still further shown from investigations made in France by man of the highest scientific attainments. Mayne says: "The geological distribution of the soil and the chemical composition of the arable lands, the climate, and certain economic and commercial circumstances, and the displacement consequent upon these, are the causes upon which depend the greater or less precocity of the bovine races." Duval calls attention to the peoples, the sheep and cattle of two districts in the same department of Aveyron. The Segala, who inhabit the older formation, are thin and wiry, while the Causse, who live upon the chalk formation, are more robust and better developed. Tremaux notices that the finest stock in France is reared on soils of recent formation, as in Normandy, Gascony, etc., while in Morvau, La Marche and Brittany, the animals of the same breed are small and scraggy. In view of all the facts adduced, we cannot fail to be struck by the intimate relations which appear to exist between geology and biology. That portion of our own country bordering upon the Gulf of Mexico is of later formation, and here we find that the Negro head makes the most rapid approaches to the Caucasian ideal. If indications are rightly interpreted, we must look to our Southern States for the Athens and Rome of America.

MEMORIAL DAY.—The 30th of May, selected as the day on which to decorate with flowers the graves of the dead soldiers of the Federal and Confederate armies throughout the Union, falls on Sunday this year. The late legislature of California passed a law making memorial day—the 30th—a legal holiday, and providing that when it falls on Sunday the succeeding Monday shall be observed; consequently, the soldiers' graves in this State will be decorated on the 31st this year. In the other States and Territories of the Pacific coast the ceremony will be performed on Saturday, the 29th. Active steps are being taken by the Grand Army of the Republic, national guards and citizens, to have the day observed in San Francisco in a becoming manner.

JUDGE T. K. WILSON has been elected Presiding Justice of the San Francisco Superior Court, vice Wm. P. Daingerfield, deceased, and department No. 3 recently presided over by Judge Wilson, was assigned to the newly appointed Judge, L. D. Latimer.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Tombstone District.

EDITORS PRESS:—This celebrated mining camp is just now attracting more attention than any other town or mining district on the Pacific coast. The village of Tombstone is situated in southeastern Arizona in latitude 31½°, longitude 109°, altitude, about 4,500 feet above the level of the sea, and some 500 feet above the San Pedro valley.

The town is handsomely located on a descending plain nine miles northeast of the San Pedro river. The streets are wide and run at right angles with each other, with perfect natural drainage. The municipal authorities consist of a Mayor and four Councilmen, Marshal and other officers. For peace and good order it will compare favorably with any town of its size on the Pacific coast. Present population 2,000; including the outlying mining districts about 5,000. The climate is splendid. The mercury in summer seldom rises above 95°, or in winter falls below 30°; and as to health it is superior to most of California towns. There has been no fog or dew since my arrival here in January last. The scenery, as viewed from the hills back of town, where the best mines are situated, is magnificent; the bold rock-ribbed mountains 20 miles to the north, the vast plains to the west as far as the eye can reach, and the high mountain ranges of the Whetstone and Huachuca southwest and far across the San Pedro river afford the lover of nature a scene of unusual beauty. The people are cosmopolitan in character, with a free and easy go-as-you-please style about them that tells the quiet observer at once that he is in the presence of old prospectors and miners that have followed every mining excitement from Alaska to Sonora. All kinds of business is well represented in this village. The merchant, mechanic, lawyer, doctor, dentist, machinist and assayer; the Catholics and Methodists have church organizations with a goodly number of members. We also have a free school, several hotels, restaurants and lodging houses.

The mines of this district contain free milling ore, known as chloride and carbonate, that mills from sixty to six thousand dollars per ton. Ore of less value than sixty dollars per ton is left on the dump, for the present, to be used at some future time when transportation and milling facilities will be cheaper. The best paying and well-defined mines at present are the Tough-nut, Contention and Good Enough. All of said mines have mills, on the San Pedro river, at Charleston and Contention cities, where their ore is hauled from the mines by large mule teams, at a cost of from four to six dollars per ton.

The Sunset, Grand Central, Empire, Head Center and Randolph mines are showing up richer ore bodies than the first-named mines, but have as yet no milling facilities to crush their ore. Most of the last-named mines have steam-hoisting works on their claims, and thousands of tons of ore on the dump ready for their mills in course of construction on the river.

As to the permanency of the mines in this district, there can scarcely be a reasonable doubt, as large fissure veins have been discovered and worked to a depth of 250 feet in several mines. All we need at present is capital to develop our mines and build mills to crush the ore. A good custom mill would enable the poor claim-owner to develop his own mine, as good milling ore can be had at a depth of twenty to sixty feet. Hundreds of poor miners here have good locations, but are only able to do their assessment work on their claims from year to year.

Wood and water are both scarce and of limited quantity. Water at the steam-hoisting works at mines is worth three cents per gallon; in the town it is sold at two cents per gallon. Wood is worth eight dollars per cord. This is a serious drawback to our prosperity, which may soon be overcome by the bringing into the mines and village the water of Sycamore springs, ten miles north of us in the Dragoon mountains, by a company of Boston capitalists. They propose to sell their water at one and a fourth cents per gallon, at which price they have a franchise from our city authorities to lay pipes in our streets, and have a monopoly so to do for the space of ten years.

The nearest point that the Southern Pacific railroad comes to our town is twenty-three miles, but a branch road is now in course of construction from that point to our mines and village. We are nearer Galveston than San Francisco. So when the railroad is finished and connections made, San Francisco will have to exert herself or she will loose a portion of her trade with us. RETLEF.

THE BARCELONA MINE.—The discovery of gold in the Barcelona mine, says the Belmont (Nevada) *Courier*, will add greatly to its value. As high as $80 per ton in gold has been returned from assayers in New York, and assays of silver from tunnel levels go as high as $1,446 per ton.

THE Ward shaft will reach the 2200 level next week. A drift will then be started to connect with the Bullion mine; also a drift will be started to prospect the Julia ground.

Prospective Processes.

The Robinson Process.

Mr. I. N. Taylor, of this city, who has recently been in New York, writes the following to the *American Exchange:*

It is during a period of intense interest in mining matters that the community wherein such an interest exists is usually apprised of the discovery of some new process for working what are termed rebellious ores. Almost every man who follows mining as a business, is likely to become not only interested but even excited over these so-called discoverics, as they have an idea that, sooner or later, a process will be discovered which will enable them to work such ores to a greater profit; therefore they are too ready to believe anything, however absurd it may be, that the inventor or discoverer claims will accomplish this object.

Composition of Ores.

It is a well-known and established fact that gold and silver in their natural condition, after their crystallization from a solvent state in fissures, are combined with iron, sulphur and arsenic, and often with other base metals. Iron and sulphur are as much the mother of gold as silica itself. There are many varieties of silver ores, but the principal ores from which the bulk of the silver comes that supplies the markets of the world, consist of the different sulphides or sulphurets. A pure sulphuret of silver contains 87 parts of silver and 13 of sulphur. Brittle silver ores are sulphuret and antimony, of which the composition is silver, 68.5; antimony, 14.7; and sulphur, 16.4.

There are several kinds of ruby silver ores. Antimonial ruby and red ruby are the most abundant. They only differ inasmuch as the red ruby carries a larger amount of arsenic, while in the others antimony predominates. The only other ore of much importance is the horn silver or chloride of silver. In a pure state, it consists of silver 75 parts and chlorine 25. The mixed ores, which are combined with lead, copper and other metals, are treated by the various methods of smelting, and do not enter into the subject of inquiry. Native silver and the chloride are the only forms in which silver is found free in nature. The chloride of silver was undoubtedly freed from its combination with other metals by being brought in contact with salt which is in the earth, and then being exposed to the oxygen. In certain localities, native silver has been redeposited from the chloride by electro-magnetism.

Methods of Treating Silver Ores.

The chloride of silver can be amalgamated up to a high per cent. of its assay value without any treatment, but all other ores require to be treated before they can be amalgamated, and in Europe the only successful way has been by grinding the ore to be treated to a fine powder, then mixing with the ore from 5% to 10% of salt, and placing it in what is called a step or reverheratory furnace, heating it to a temperature sufficient to eliminate the arsenic, which is the first to pass off; and if the ore carries gold great care is needed, for if the furnace is too hot when the ore is put in the arsenic will volatilize the gold, and it will not pass off in the fumes with the arsenic. After two hours the sulphur of the sulphurets ignites, burns off, and in Freihurg and Swansea is converted into sulphuric acid, so that the metals become oxides and sulphates. The temperature of the furnace is then raised, when the chlorine of the common salt forms volatile chlorides with zinc, antimony and iron, and affixed chloride with silver. During the roasting the ore is continually stirred until the chloride forms into coarse powder; it is then in a condition that the quicksilver will absorb it.

The only improvement ever made on the process for working silver ores has been made in the mechanical appliances for handling the ore automatically instead of hand labor, which has no connection with the chemical treatment. In California they use a cylinder furnace instead of a reverberatory one, which is constructed of cast iron, generally 30 feet in length, tapering from 50 to 40 inches in diameter. The furnace is made to revolve about four times a minute, the fire heating the furnace enters at the large end, and the ore, which is prepared precisely as above described, is fed into the small end of the furnace, and gradually passes toward the flame; a suction fan drives a current of air through the furnace with the flame. As the furnace revolves it raises the ore and showers it through the heat and oxygen at the same time, thus allowing the sulphur to pass off, and in this manner more thoroughly oxidizing, desulphurizing and chloridizing in one hour than in the reverberatory furnace in six hours. Gold ores are treated in the same manner and in the same furnace, excepting that salt is not used in the roasting.

The Amalgamation Process a Failure.

No one has ever made a success in treating gold sulphuret ores by amalgamation, and this is owing to the fact that all the sulphur cannot be driven off by roasting, and as long as any of the sulphur remains in the ore the gold will not amalgamate with the quicksilver. The sulphur can be driven off by the introduction of combustible gas into the furnace, which ignites with the sulphur, and will leave the ore thoroughly desulphurized. If the iron is thoroughly oxidized the gold can be amalgamated to a higher per cent., but this treatment, as used in California, was found to be more expensive than the chlorine process. They therefore make use of the latter.

Neither has anyone ever succeeded in amalgamating any of the rebellious silver ores which have been mentioned, except they first changed them from a sulphuret or sulphide to a chloride, and this can be done only with chlorine gas (formed from common salt) when the ore is at a proper state of heat.

The Robertson Process.

The Robertson process so-called was brought to my attention first in California about a year ago, and upon the request of some capitalists I examined it and failed to find any merit therein. Mr. Robertson claims to treat all rebellious gold and silver ores up to their fire assays at a cost not to exceed from $3 to $4 per ton. The treatment in question by which these wonderful results are obtained is, as I understand it, to first run the ore to be treated through an ordinary rock breaker, after which it is heated in a roasting furnace to a cherry red, when it is thrown into what he terms a chemical bath, which, it is claimed, oxidizes, desulphurizes and neutralizes it ready for the amalgamating pan.

The chemicals used in the preparation of this bath consist of one pound of cyanide of potassium, and one pound of sulphuret of copper, and ten pounds of common salt to a ton of ore. The cyanide of potassium is used for the purpose of keeping quicksilver clean by all mill men, and the sulphuret of copper is used by some amalgamators in working free silver ores. There is a difference of opinion among them as to its use. Some claim it is of no benefit to the amalgamation, while the contrary is claimed by others; but all metallurgists and mill men will agree with me in saying that neither of these chemicals has any immediate effect on ores, and any claim to the contrary cannot be substantiated by fair practical tests.

Common salt has a strong tendency to oxidize iron when brought in contact with that material and oxygen, but when in solution has no immediate effect upon any metal, and the roasting of the ores treated by the Robertson process is the most imperfect in use, and, as previously stated, a good result cannot be obtained by amalgamating gold sulphurets, except they are first thoroughly oxidized and desulphurized, and the Robertson process does neither; nor can be or any other "process man" amalgamate silver, except it is in the form of choride, horn silver, or native silver; nor will his process, or any other, change a sulphide or sulphuret of silver to a chloride in any other way than that which I have described. If it is a fact that man can not invent a perpetual motion in contradiction of nature's laws, it is equally true that, by the Robertson process, they cannot amalgamate rebellious gold and silver ores in violation of the laws of chemistry and of nature.

By the Robertson process they claim to have worked in quantity the rebellious ores of Meadow Lake, and to have obtained 90% of their assay value; but, from personal knowledge and late inquiries in California, I know that by it they have not worked *in quantity* these or any similar rebellious ores with success, but to the contrary; therefore, it is my opinion that this process cannot be made of practical benefit or profit as claimed.

Micro-Mineralogy.

At the last meeting of the San Francisco Microscopical Society, Melville Attwood, Esq., read a paper "On the impregnation of portions of the walls, or enclosing rocks of the Belvidere lode, Bodie, with native silver, electrum and cerargyrite." He said:

Since I had the honor of becoming a member of this society, now nearly eight years ago, most of my leisure time has been spent in the study of microlithology, and I have, during that period, cut and prepared for microscopical examination, a very large number of rock sections; but those marked Nos. 1, 2 and 3, which I now submit for your inspection, are, without exception, amongst the most beautiful and instructive that I have made.

The simple mode I use in cutting them, and which I had the pleasure of calling your attention to in my last communication to the society, I would also strongly recommend to the "geologist in the field." I found the great advantage of it in preparing these sections, as it enabled me to watch the operation very closely, to guard against making them too thin, as the character and beauty of the section would then have been destroyed.

The sections marked Nos. 1, 2 and 3, are cut from pieces of the wall, or enclosing rock (a much altered grayish-green trachytic diorite), of the Belvidere lode, taken at a depth of about 300 feet below the surface of the ground.

If they are examined by the aid of a good binocular, using a two-third objective and the paraholic illuminator, the native silver in leafy sheets, also the filiform particles of electrum, and grains of cerargyrite will be made to appear as if floating in a glassy and yellowish liquid mass. The cerargyrite grains are surrounded, or fringed, with native silver. The forms of some of the altered hornblende, of a yellowish color, are tolerably well preserved, while others show that they have been partially dissolved, and the spaces or cavities so formed, to a certain extent, replaced by silver, small grains of which are to be seen in both the altered crystals of feldspar and hornblende. Minute crystals of pyrites are also visible in the sections, and in the little cells left by the decomposition of some of the pyritic crystals are thread-like pieces of electrum. The impregnation of the country rock from which these sections were taken, I think, took place contemporaneously with the filling of the fissure.

The solutions from which the minerals of the Bodie lodes were precipitated must have been aqueous, otherwise it would be difficult to account for the presence of so large a portion of "wad" which is found mixed in with the vein-stone.

The grains of ore from impregnation are generally so minute that they cannot easily be recognized by the naked eye, so that under any circumstances they are better viewed by the aid of a good microscope.

The piece of quartz marked No. 4 is from the Belviders lode, and, if dipped in water and then examined with a good lens, the electrum, or Bodie gold, will be seen in beautiful thread-like particles throughout the whole mass.

No. 5 is a piece of "wad" from the Standard lode, Bodie.

Mr. Hanks made a very careful assay of the Bodie electrum, with the following results: Gold, 683.4; silver, 364.1; total, 997.5; specific gravity, 15.15; color, pale yellow, resembling German silver.

No. 6 is a section cut from rock taken from the 500 level of the Dudley mine, Bodie, the deepest in position, I think, on the Bodie metalliferous channel.

No. 7 is a section of rock from Gold Hill, taken from a point 60 feet west of the Comstock lode, and at a depth of 3,000 feet.

Mr. Frank Rutley, in his valuable little book on "The Study of Rocks," remarks: "There is, however, a disadvantage attending the use of lenses when they are applied to the examination of rocks. This lies in the difficulty experienced by the observer when he attempts to examine the streak of minerals under the lens, especially when the minerals occur in very minute crystals or patches, as it is scarcely possible to hold a specimen, with a lens over it in focus, in one hand and work with a knife in the other. Laying the specimen on the table, and using a lens in one hand and a knife in the other, is a most unsatisfactory process, while the use of a lens fixed on an adjusting stand is scarcely better. To obviate this difficulty, the author has devised a small lens with a clip which can be worn on the nose like an eye-glass, and both bands are then at liberty—the one to hold the specimen firmly, the other to use the knife or graver. Instead of a clip-lens, I use a watchmaker's eye-glass, fixed with a screw into a light pair of steel spectacle frames, the same as I send for your inspection. I think the botanist also will find it a very useful arrangement.

Mr. Hanks remarked that it was a mistake to suppose that a rock section must be cut so thin as to be wholly transparent. In some cases this is necessary; but, as a general rule, the section should be left as thick as possible, and strongly lighted by the aid of paraholic reflector. The beauty of many specimens is destroyed in the effort made to fit them for observation by simple transmitted light.

Mr. Atwood's plan, to cement the section to a glass slide, and to examine it from time to time under the microscope as the work progresses, is very important, as it will enable the student to stop at the exact point when light can be passed through it, but before many of the most interesting features are destroyed by over-cutting.

MINARET DISTRICT is situated six miles north adjoining this district, and is so called from its proximity to the famous peaks of that name which rise immediately to the north of it, and whose cathedral-like spires stand out in bold relief and form a prominent land-mark from the eastern and western sides of the Sierra Nevadas. This curious freak of nature, as well as glacier mountains a little further to the north, are yearly visited by many of the curiosity-hunters and men of letters from the scientific institutions of this country and Europe, who, after paying a visit to the big trees of Mariposa and the grand scenery of the Yosemite Valley, rarely fail to climb to the top of the snowy mountains that they may enjoy the majestic view. The Minaret mines were discovered about two years ago. The ledges are very large and traceable for a considerable distance. The ore found is of fair average quality; wood in abundance, and water sufficient for milling purposes in the close neighborhood of the mines, which are found on the Summit dividing the main branch of the San Joaquin and Murderer's (or Deadman's) fork of Owens river. The ledges are found on both the eastern and western slope of the mountain. The ascent from the eastern side is gradual, and an almost natural road to the summit has been found, which with but little work, can be made available for wagons. From the western side, however, it is very steep, but the trail up the mountain is short, and pack and saddle horses have no trouble in making the ascent. The distance from Lake by the western road is about twelve miles, and by the trail on the eastern side six miles from the Mammoth mill.—*Mammoth City (Cal.) Herald.*

GOLD.—Three gold bars from the Smartsville hydraulic claims have lately been shipped to an assay establishment in San Francisco. Two of the bars weighed respectively $29,600 and $18,000.

THE water is so strong on the 2400 level of the middle mines—Chollar, Hale & Norcross and Savage—that work in the several drifts at that depth cannot be resumed.

WATER has been struck on the Colorado desert at a depth of 280 feet, and is pure and free from alkali.

MECHANICAL PROGRESS.

Locomotive Boilers—Iron vs. Steel.

For years past, a committee of the Master Mechanics' Associatien has been investigatiug the gcaeral subject of locomotive boiler construction, with respect to methods, forms, proportions, materials, etc. The reports submitted from year to year contain a great deal of interesting information upon all these points, hut without settling very conclusively any one of them. Ia regard to the best material for the shell and fire-boxes, it is important to determine the respcctive merits of stoel aad iron; but the evidenee in this particular, as contaiued in the committee's report made last year, is somewhat bewilderiag. Boilers msde of each material corroded, pitted and furrowed very nnequally, the results heing diametrically opposite on different roads and in different localities. Mr. Hayes of the Illaois Ceatral, has several eagines, tho hoiler shells of which are made of Low-Moor iron. They have been in service 23 years, with but little siga of corrosion or pitting in the sheets, those in the hottom of the boiler having never been ronewed, aad heing to all appearance in good conditioa. In 1874, he hnilt two new engines, the hoiler shell of one being of a high grade of steel, and the other of iron. Both were put in the same service, on the same section of the road, and made equal mileage. The steel boiler suffered most from corrosion and pitting, while the iron one was but slightly corroded. Another "open hearth" steel hoiler, built in 1876, showed similar results; in fact, all the steel hoilers built by the company within a period of five years pitted and corroded worse than the iron ones.

In marked contrast with this experience, Mr. J. M. Boone, of the western division of the Pittshurg, Fort Wayne & Chicago road, holds that steel is the hest material for boilers, with either coal or wood as fuel. His first steel hoilers were huilt ia 1871, and there had heen no pitting, furrowiag or corroding inside of them; whilo iron hoilers of the same size, performing the same service and using the same water, corroded so badly in six years, that the sheets had to ho renewed. Mr. Sedgely, of the Lake Shore road, gives similar testimony in favor of steel. Mr. Fuller, of the Atlantic & Great Western, bad also obtained the hest results from steel, although tho boilers made of it were not entirely free from furrowing. The fire-boxes also furrowed on top of mnd-ring, especially when lime water was nsed.

Various theories are advanced to account for these contradictory results, the most plausible of which relate to the impurities in the water used; lime watsr having a more injurious effect, apparently, upon steel crown-sheets than npon iron. Furrowing, according to the report, at seams, curves and where braces are attached, is easily accounted for, hut pitting occurs at nnlooked-for places; is a serious difficulty on some roads and on otbers is scarcely known. The particular cause of it is unknown aad also the remedy.—*National Car-builder.*

NAPTHA AS FUEL FOR LOCOMOTIVES.—An experimental test of the Holland hydrocarhon retort, for generating steam on locomotives, bas recently heen made on the Long Islaad railroad. The grato-bars of an ordinary engine were taken out and the retort put in their place, containing four compartments, two for water and two for oil. A tank of naptha was placed in the tender and connected with the retort by gas pipes. An almost pure hydrogen gas is generated in the retort, whicb produces an intense heat and no smoke. The trial was very successful, although made nnder certain unavoidable disadvaatages. The cost of the oil consumed was nine cents for six miles, the crude naptha costing three cents per gallon. The experiment was witnessed by a large number of merchants and scientific men, who tendered the inventor, Dr. Holland, a vote of thanks.

A REMARKABLE PLOW.—A Chicago agricultural journal gives an account of the largest plow ever known to he made, whicb has heen recently turned out by an Illinois firm of agricultural machinery makers for use on the St. Louis, Iron Mountain and Southern Railway. It is attached to a platform bar of a construction chain in sucb a way as to cut its ditcb a sufficient distance from the railway line. It will make one mile of ditch, 2 feet deep and 3 feet wide, every 4 hours, thus doing the work of about 1,000 men. The beam is made of swamp oak, and is 8 inches hy 4 inches, the land side heiag made of bar iron 8 inches wide and 1½ inch thick, which bad to be forged expressly for the purpose. Its total weight is 1,700 lbs.

A NEW BOOT SOLE.—A Chicago boet manufacturer, Mr. Goodrich, has introduced what he is pleased to call an indestructihle sole, in whicb nickel-plated stecl rivets are embedded ia the leather. These rivets are forced through perforations from the inside of the sole to its outer surface, and being less in length than the tbickness of the leather, the head ie securely emhedded, and does not drop out as the sole hecomes worn. Owing to the nickel-plating, it is claimed there is an entire absence of rust.

TO ASCERTAIN THE SIZE OF THE DRIVER.—Multiply the diameter of the driven by the nnmher of revolutione you wish it to make, and divide the product by the revolutions of the driver; the quotient will he the size of the driver.

Friction and Traction.

Every mechanic knows that friction is the resistance produced by the rubbing of the surfaces of two solid bodies against each other. Perhaps a better dcfinition is "the resistance which the surface of one body presents to the motion of that of another when in close contact." So much depends on the knowledge of these priaciples in the operation of modorn machiaery, that an explaaatiou thereof mnst he admitted to constitute an ossential item in an illustration of the first principles of the scieace of mecbanics. Traction consists of the same resistanco which produces friction. In mechanics, the angle of traction is the augle which the direction of the power makes with a given plane. Tractioa implies the same resistance as frictioa, but in such a degree as to prevent any motiou of the second surface on the first.

The resistance of friction is produced hy a minute roughaess of the surfaces, wherehy the projectiag points of one surface take hold of those of the other; on this aceount, the resistance is found to he greater hetween two surfaces of equal metals or materials than hy those of diverse articles. The friction between two pieces of iroa, or two pieces of hrass, is greater than that between iron and hrass. No metallic substance cau he sufficiently polished to prevent this resistance; for although the roughness of the suhstaace may not be palpahle or visible, yet it evidently does exist in the smoothest metallic suhstaaces. To avoid, as much as possihlo, this resistance, machiaists and millwrights have adopted the practico of making pivot hoxes of a different materisl from that of pivots or gudgeons of machincry, sad of oiling the surfaces of the parts of machinery that are exposed to friction, thus filliag the cavities and preventing the actual contact of the surfaces.

The resistance of friction is, in some measure, proportionate to the force with wbicb the two surfaces are pressed together; it also depsnds, in some measure, on the extent of the surfaces whicb come in contact; but it has hesn proved hy expsriment that the resistaace of friction is increased very little, if any, by the increased velocity in moving surfaces; hence it is advisable to use as small pivots as are consistent with safety with regard to strengtb. Traction is a word which has heen in use only since the iatroduction of locomotives. When steam power was first iutroduced on railroads, considerable douht and anxiety prevailed on this subject, and various plaus were invented and patented for preventing the engine wheels from sliding on the rails; but all these inventions have been rendered useless hy the development of the important fact that the puhlic bas uo occasion for them.—*Millers' Journal.*

NEW USE FOR SAWDUST.—Sawdust can be converted into a liquid wood, and afterwards into a solid, flexible, and almost indestructihle mass, whicb when incorporated with animal matter, rolled and dried, can be nsed for the most delicate impressions, as well as for the formation of solid and durahle articles, in the following manner: Immerse the dust of any kind of wood in diluted sulphuric acid, sufficiently strong to affect the fibers, for some days; the finer parts are then passed through a sieve, well stirred and allowed to settle. Drain the liquid from the sediment, and mix the latter with a proportionate quantity of animal offal, similar to that used for glue. Roll the mass, pack it in molds and allow it to dry.

FALL OF A METALLIC ROOF.—On a cold nigbt of last Decemher, when the thermometer stood at 5° Fahr., the metallic roof of St. Martin market, Paris, suddenly fell. It was huilt upen rigid supports and seems to bave been sufficiently stroag. The cause of the fall was therefore a mystery, and the Frencb engineers are discussing the subject with mucb interest. They very geuerally agree in regarding the rigidity of tbe supports as a defect, and in thinkiag that the extremities of every heam should be allowed sufficient lateral play to prevent any injurious effect, either from contraction by cold or from expansion hy heat.

AMERICAN MACHINERY IN ENGLAND.—American machinery for the manufacture of shears has lately been introduced into Sheffield by the manufacturers, to the great dismay, it is said, of the operatives, who, up to the present time, have had tbe reputation of being the most arrogant of strikers. The forging and grinding machines introduced are reported to he giving the most complete satisfaction, and, now that they have been introduced, will no doubt contrihute materially to the settlement of labor trouhles.

TO DETECT AN UNSOUND WELD.—If a piece of iron appears to have an unsound weld, or if it has a crack apparent upon the surface and it is desired to know how deeply it penetrates, beat the part to he tested to a red heat and pour a fine stream of watsr upon the faulty spot, but mainly on one side of it, and the iron on that side will lose its redness more rapidly than the other side, and plainly indicates how deeply tbe fault extends.

TO FIND THE HEATING SURFACE OF CYLINDER BOILERS.—Multiply two-thirde of the circumference of tbe shell in inches by its lengtb in inches; add to tbis product the arsa of one head if exposed to tbo action of hot gases, and divide by 144. Tbe quotient will he the numher of square feet of beating surface.

SCIENTIFIC PROGRESS.

Theory of Light and Color.

Prof. Tyndall recsntly gave at the Royal Institution, the first of a course of six lectures on "The Theories of Light and Color." A good deal regardiag light was, he ssid, known to the ancients. They knew the law of reflection and somethiug of that of refraction, as shown hy ths refereuce of Seneca to the hroken appsarance of an oar when thrust into the water. Another phenomenon, that of tho raiuhow, standiug out in the sky as a sort of challenge to the human eye, could not escape detection. At one particular aagle, as shown hy Descartes, heams reflected hy or emergiug from a drop of rain were so welded together as to form a condensed sheath of rays, aad it was in this condensed sheath tbat you saw the colors of the rainhow. Milten, in 1672, proved by the use of tho prism acted on by a heam of light thrown throngh an aperture in a window shutter into a dark room that white light is not homogeneal, hut is composed of various coastituents more or less refrangible, of which red is the least and violet the most refraagible. This premiscd, Prof. Tyndall, hy a series of heautiful and interesting experimcnts from apparatus managed hy his assistant, threw upon a whito screen disc of several colors in order to prove tho true effect of intermixture. Thus the ordinarily received theory that comhiaation of yellow and hlue produces green was sbown to he erroneous, the true effect of the comhination of those two colors heing, as proved to ocular demonstration, white. By the same means the true complementary colors were displayed. Fixing tbe eye on a white disc nntil the lecturer counted 20, and the special illumination of the disc was withdrawn, the spectator saw remaining the filmy semhlance of the complementary color, black. Blue left orange, red left greea.

THE NATURE OF LIGHT AND ITS ACTION UPON THE EYE.—At a recent meeting of tbe Buffalo Microscopical Club, Dr. Lucien Howe presented the suhject of the undulations of light and their perceptions hy the eye. Brief mention was made of the diffsrent theoriss, accounting for the pbenomena of optics previous to the present century. Tbe difficulties of this subject were first solved by Thomas Young, wbo satisfactorily explained tbe undulatory theory of light. He showed that what we call light is impression produced upon tbe retina by tbe wave-like motion of the particles of matter. Subsequently the lengths of these waves were measured. It would take 36,918 waves of red light, or 64,631 waves of violet ligbt, placed end to end, to make an inch. From the speed of light, wbicb has been measured, it is proved that at least four huudred and fifty one millions of millions of these minute waves flow into the eye and dasb against tbe retina in eacb second. Dr. Howe proceeded witb a minute description of the microscopical anatomy of the eye, more particularly relating to tbe "layer of rods and cones." These were stated as heing in reality tbe terminal filaments of the optic nerve. Tbese are shaken or acted on by the waves of ligbt, and it is especially tbese witb wbich we see.

CALORIFIC EFFECT OF STEAM BOILERS.—Scheurer-Kestner estimates tbe loss of beat from the fire of a steam boiler, by radiation and conduction, at 25.5%. Some writers say 40%. As tbe loss bas never heen directly determined, but only estimated from the differences between other data wbich were imperfectly ascertained, these figures are very problematical. Ferdinand Fischer suggests experiments with combustibles of uniform composition, sucb as illuminating gas or petroleum, for determining calorific values and tbe various losses of heat. By adding the quantity of gas set free by comhustion and elevated temperature, and taking account, by tbe belp of Linde's formulas, of the specific beat wbich varies witb the temperature, it would he pessible to reach an accurate knowledge of the amount of heat transmitted through the metal to the water of the boiler.—*Dingler's Journal.*

TEMPERATURE OF DEEP WATER.—F. A. Forel has made a series of observations on the Swiss lakes, similar to that of Buchanan at Loch Lomond. He finds that the limit of tbe superficial chill is mucb greater than has been hitherto supposed, extending in some cases even to the depth of 110 meters (120.3 yards). The penetration of the cold into the upper layers take place very gradually and progressively. It dees not appear to he accomplished either hy convection or by mechanical mixture under the action of waves and currents, hut may perhaps be connected with conductihility and radiation. Observations extended over an interval of 40 days showed a great uniformity of temperature, hut at no time was the uniformity complete throughout tbe whole depth of the lakes.—*Comptes Rendus.*

A SCIENTIFIC NOVELTY.—At tbe recent annual meeting of the Paris Physical Society, wbich took place on April 2d, in the hall of the *Societe d'Encouragement*, a numher of novelties were presented. Amoug them was a most curious experiment with M. Trouve's *polyscope*. This *savant* is reportsd to bave "placed hie electrical polyscope in the stomacb of a fisb swimming in an aquarium, and, without its seeming to euffer any inconvenience, it radiated a light equal to one candle."

WHITE FISH UNDER THE MICROSCOPE.—At a recent meeting of the Griffith Club of Microscopy (Detroit), Mr. J. C. Holmes, assisted by D. J. McGuire, M. D., gave a demonstration of the circulation of hlood, illustrated by young whitefish from the Detroit "hatchery." The young fish, less than a week old, and looking not ualike a pair of eyes propelled about hy an exceediugly active tail, were found, under the microscope, to bs possessed of all necessary "interior" arrangements. As they are nearly as transpareut as glass, the action of the heart in receiving and propelliag blood, and the stream of hlood corpuscles down oae side to the tail, and back on the other, could he distinctly scen and examined. The whitefish that are caught for this market are largely made to recoguize their ohligation to posterity, hy passing through the "hatchery," where the *modus operandi*, as described by Mr. Holmes, is as follows: The eggs are stripped from the females by pressing the sides with the hands, and deposited in a large tin pan partly filled with cold water. Into this are placed two or three drops of milt, which is ohtained by a similar process from one of the male fishes, and which coutains the male principle of life—the microscopical spermatozoa. Each drop of the milt contains several thousands of these minnte organisms, that would remain undeveloped hut for the favorahle conditions found in the female egg. These spermatozoa penetrate the eggs, and curling themselves up comfortably await the necessary five months to incuhate. It is now the hatching season, and the unhatched eggs ressmble a small pea, of a nearly transparent color, but with two distinct hlack dots on one side, which the microscope shows to he the eyes of the fisb.

PHOTOGRAPHY UNDER WATER.—Wm. Morris, of Greenock, says the Glasgow *News*, has made a discovery hy which he can photograph undcrneath the water at a depth of 10 fathoms. Two of the negatives he has sccured are remarkably distinct, hut the others are rather dim owing to defects in tbe apparatus, whicb be hopes to remedy. Tho camera is inclosed in a watertight glass case, suspended by the center and enclosed by a cover, that is drawn off after the camera—whicb is fixed on a loaded triped—has reacbed its position. One of the views taken in the bay, shows a sandy hottom, witb a number of large boulders covered with seaweed, and an old anchor; and, in the shade, three mooring cables belonging to small yacbts close at hand. When the weather calms down and the light hecomes stronger, Mr. Morris intends to carry out his investigations witb improved apparatus, when be expects to achieve still greater results.

MAGNETIC WRITING.—Prof. Thompson, of Bristol, bas lately made an interesting observation in regard to an application of magnetism. He takes a thin plate of hardened stcel and writes upon it witb a magnetized iron style, tbus communicating a tolerahly permanent magnetism to the parts of tbe plate which are covered hy tbe writing. If fine iron filings are sprinkled upon tbe plate and the plate is then held perpendicular, so as to remove the loose filings, tbe writing becomes visihle upon the magnetized portion. The experiment may be repeated, at pleasure, for an indefinite period.—*Fortsch. der. Zeit.*

KEEPING WET PHOTOGRAPHIC PLATES FROM DRYING.—As dry plates are not always obtainable, and ordinary wet plates dry so quickly as not to allow transporting, it often becomes necessary, in order to make a single picture, to carry as mucb apparatus as would he required to make a dozen or more. A very good metbod of preparing a wet plate so as to last for several bours consists in flowing tbe plate (after taking out of the hath) witb a mixture of one part of strong solution of silver (80 grains to an ounce), and two parts chemically pure glycerine. Flow and drain tbe plate until all streaks disappear and the plate remains smootb.

TOUGHENED GLASS FOR LEYDEN JARS.—It bas heen found by M. Ducretet that "toughened" glass oppeses mucb greater resistance to tbe passage of electricity tban ordinary glass, and, consequently, wben employed for leyden jars, is capable of receiving without being fractured, a much stronger charge of electricity. This fact may he of great importance, as leading to tbe construction of extremely thin condensers, capable of giving great effects. Plates of toughened glass can he employed in tbe same manner.

NEW ELECTRO-MAGNET.—Chambrier increases the powsr of electro-magnets hy increasing the extent of active surface at the extremity of tbe core and of tbe oscillating armature. This be does hy various methods. He hollows the core and gives to the armature a projection fitting into the cavity; or he attaches the projsction to the core, making it fit a cavity of the armature, etc. All of his methods are nearly equivalent in effect.

THE FORMATION OF DELTAS.—Devon thinks tbat too little attention is paid to making a proper distinction hetween torrential deltas and the deltas of large rivers. He believes that this distinction is as important in all cases as that which has heen estahlished hetween marine and lacustrine deltas.

ELASTICITY OF CHROME STEEL.—In his experiments upon tbe hydrodynamometer, Pellot found that the elastic resistance of chrome steel could he pushed to a much higher figure than that of any other metal which he tried, without passing tbe limit of elasticity.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 29.		Week Ending May 6.		Week Ending May 13.		Week Ending May 20.	
Alpha	7	6½	6⅝	6	5⅞	5	7	5
Alta	3	2	2.35	1.95	2.30	1⅞	3.05	2
Andes	1	75c	95c	80c	75c	60c	1.10	80c
Alps	....	....	....	....	....	....	....	....
Argenta	50c	35c	35c	20c	25c	15c	25c	20c
Atlantic	....	....	10c	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	2.60	1.45	2.55	1.70	2.80	2	3.60	2.85
Belmont	55c	40c	35c	....	....	....	55c	25c
Best & Belcher	11	8½	9¾	8	8⅞	6	14⅜	8½
Bullion	3⅜	2⅜	3¼	3.05	2.35	2.40	3⅜	2.35
Bechtel	1.60	1¼	1.60	1½	1.80	1½	1⅞	1.70
Belle Isle	50c	....	60c	50c	50c	45c	50c	45c
Bodie	8⅛	7⅜	8	7⅛	7⅜	6	7⅞	7⅛
Benton	1.80	1.50	1.45	1.05	1½	1	1.95	1.40
Bulwer	6⅜	5⅜	5¼	5	7	5⅛	6⅜	5⅛
Boyle	....	....	....	....	....	....	....	....
Black Hawk	90c	75c	80c	70c	75c	50c	75c	60c
Belvidere	3.30	2⅜	2⅝	2⅛	2⅜	2⅛	2⅜	2.45
Booker	40c	30c	50c	35c	40c	30c	40c	35c
Caledonia	85c	50c	70c	30c	35c	25c	70c	40c
California	2.80	2.45	2.70	2.10	2.20	2	2.30	2.10
Challenge	1.85	1⅜	1.60	1⅜	1.40	80c	1.80	1.80
Chollar	4.80	3.90	4.35	3.95	3.60	3.05	4⅛	3.60
Confidence	6⅜	5⅛	6	5⅛	5¼	4	7⅛	4⅜
Con Imperial	40c	30c	40c	30c	35c	30c	45c	35c
Con Virginia	3⅛	2.80	3.45	3	3.05	2⅜	3⅜	3
Crown Point	2.10	1.70	2	1.70	1⅞	1½	2.30	1⅞
Con Washoe	....	....	....	....	....	....	....	....
Champion	90c	70c	95c	80c	90c	70c	75c	60c
Concordia	1	60c	1	90c	1	85c	80c	70c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	25c	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	90c	65c	60c	55c	55c	50c	55c	45c
Eureka Con	20	19½	20	19½	19½	18½	19	18½
Exchequer	2.65	2.05	2.55	2	1.95	1½	2⅜	1.95
Endowment	30c	25c	25c	....	....	....	16c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	85c	60c	70c	60c	70c	50c	1.10	85c
Gila	....	....	....	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodshaw	30c	25c	55c	20c	70c	55c	95c	60c
Gould & Curry	5¼	3⅞	4⅜	3.85	3.80	3.20	5⅞	3⅜
Hale & Norcross	4.25	3⅜	4.35	3.30	3⅜	2.60	5¼	3.10
Hillside	35c	....	35c	25c	25c	....	75c	....
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	45c	30c	50c	30c	30c	....	25c	....
Julia	1.20	75c	1	75c	75c	55c	90c	70c
Justice	1.65	1	1¼	1	90c	75c	1.30	90c
Jackson	4	3⅛	3⅛	....	3⅜	3	3	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	4	....	4¼	....	4¼	....	....	....
Kentuck	2⅜	2	2.60	2¼	2⅜	1⅞	4⅛	....
Kossuth	....	....	....	....	10c	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	15c	....	....	....
Lady Wash	60c	40c	45c	35c	40c	30c	60c	35c
Leopard	5c	....	5c	....	....	....	....	....
Leviathan	35c	30c	30c	25c	30c	....	30c	25c
Leeds	....	....	....	....	....	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	25c	20c	20c	10c	25c	20c
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	90c	50c	85c	....	85c	....	60c	....
McClinton	60c	50c	45c	35c	40c	35c	55c	35c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	10⅛	6⅜	8⅛	6⅜	7¼	5⅛	11⅛	8⅛
Midas	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	20c	15c	15c	10c	35c	25c	85c	45c
Northern Belle	14⅜	11⅛	11	8⅛	11	9⅜	11⅜	8⅜
New Coso	....	....	....	....	....	....	....	....
Navajo	35c	25c	45c	25c	30c	25c	....	....
Occidental	1.60	1	1¼	1.10	90c	55c	2	1.20
Ophir	10⅛	6⅜	8⅜	6⅜	8⅜	5	11⅜	8⅛
Oriental	....	....	....	....	....	....	....	....
Overman	1⅜	85c	1.20	80c	1⅛	1.05	2⅛	1⅛
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	2	....	....	....	....	....
Phil Sheridan	15c	10c	15c	....	15c	....	....	....
Potosi	3.60	2⅜	3.40	2.95	2.60	2.20	3⅛	2⅛
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	25c	5c	20c	5c	30c	25c	30c	25c
Richer	....	....	10c	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	3.95	2⅜	3.60	2.45	3.40	3	5	3.15
Seg Belcher	....	....	7⅛	....	9	6⅜	11	8
Sierra Nevada	15⅜	9⅛	11⅜	9⅛	10⅜	8	18	10⅛
Silver Hill	60c	30c	40c	25c	25c	10c	1	15c
Silver King	5	4.90	5	4⅛	4⅜	....	4.10	4
Silver Prize	....	....	....	....	....	....	....	....
Sncoor	....	....	....	....	....	....	....	....
Summit	1.10	1	1.10	1	1.30	1.05	2	1.40
Scorpion	2⅛	1.10	1⅛	1.10	1.15	85c	1.30	1.15
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	25c	20c	35c	20c	80c	20c
Star	30c	25c	30c	25c	30c	....	30c	25c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1.30	1.20	1⅛	1	1	....	1⅛	1.10
Tioga Con	2.10	2	2.05	1.60	1⅛	1.55	1.90	1⅛
Tiptop	7⅛	6⅜	8⅛	5	6⅜	5⅛	6⅜	6
Trojan	10c	....	....	....	10c	....	5c	....
Union Con	26	18	21	17⅞	18⅛	14⅜	23⅛	18
Utah	10	6⅛	8	6⅜	6⅜	5	14	7
Vermont Con	....	....	....	....	....	....	....	....
Ward	2.10	1⅛	1.65	1⅛	1.30	1.05	1.40	....
Wells-Fargo	....	....	....	....	....	....	....	....
Woodville	....	....	....	....	5c	....	....	....
White Head	....	....	....	....	....	....	....	....
Yellow Jacket	7⅛	5⅜	6	5⅜	5⅛	4.10	7⅛	5

Sales at S. F. Stock Exchange.

Thursday A.M., May 20.

10 Alpha	.53	390 Boston	1⅛@1.55
360 Alta	.2½@2.70	500 Belmont	.45@40c
605 Andes	.95c@I	50 Black Hawk	.65c
420 B & Belcher	.11⅛@11	45 Bulwer	.6½@5⅞
300 Belcher	.2.90@2.95	10 Bodie	.7
440 Bullion	.3½@3.65	475 Booker	.40@30c
175 Benton	.1.50	50 Concordia	.65c
500 Con Virginia	.3.20@3.15	50 Champion	.75c
120 Chollar	.3.80@3⅝	600 Day	.75@60c
160 Crown Point	.2.10	650 D Standard	.50c
1650 Con Imperial	.40c	50 E Mt Diablo	.55c
56 Confidence	.6⅞	750 Grand Prize	.30@70c
100 California	.2.55@2.30	350 Goodshaw	.70c
50 Challenge	.1.60	30 Holmes	.30c
600 C Dorado	.80@75c	100 Hillside	.50c
175 Caledonia	.55@65c	200 Independence	.40c
50 Essex	.1.60	730 Jupiter	.1.60@1.55
510 Exchequer	.2.30	300 Mammoth	.2½@2.15
220 Gould & Curry	.4.90@4⅜	30 Mono	.8
50 Hale & Nor	.3.05@4	600 Mt Potosi	.1@1.05
290 Julia	.80@75c	100 Manhattan	.90c
930 Lady Wash	.40@45c	100 Metallic	.75c
560 Mexican	.8@8⅛	50 Northern Belle	.11⅛
950 New York	.70c	160 Noonday	.4.00
100 N Bonanza	.40c	60 N Noonday	.5⅛
300 Ophir	.9½@10	300 Orient	.20c
440 Occidental	.1.85@2	580 Oro	.3@2½
780 Overman	.2.35@2.25	150 Paradise	.40c
815 Potosi	.3@3.20	100 Queen Bee	.30c
725 Sierra Nevada	.14⅜@15⅛	200 Real del Monte	.70c
175 Savage	.3.90@4	100 Raymond & Ely	.30c
925 Silver Hill	.80c	100 Star	.25c
10 Seg Belcher	.8	420 Summit	.1⅛@1.65
1520 Scorpion	.1.70@1.50	250 Syndicate	.1.20@1.10
925 Utah	.10⅛@11⅛	100 South Bodie	.25c
455 Union	.19@19⅛	1200 S Bulwer	.1.45@1.35
495 Yellow Jacket	.6½@6⅝	150 Tiptop	.6
AFTERNOON SESSION.		50 Tuscarora	.250
600 Addenda	.1.05@1	20 Tioga Con	.1.70
950 Albion	.30@35c	1750 University	.25@30c
100 Argenta	.20c	160 Wales	.3.1

THE President has approved the bill for the relief of settlers on public lands.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	12	1 00	May 12	June 16	July 7	W Willis	309 Montgomery st
Alta S M Co	Nevada	17	60	Apr 5	May 10	May 31	W H Watson	302 Montgomery st
Argenta M Co	Nevada	5	25	Apr 28	June 2	June 22	E M Hall	327 Pine st
Belcher S M Co	Nevada	22	75	Apr 2	May 6	May 27	J Crockett	203 Bush st
Benton Con M Co	Nevada	3	50	Apr 2	May 7	May 25	W H Watson	302 Montgomery st
Booker Con M Co	California	5	20	May 10	June 15	July 7	W H Lent	309 Montgomery st
Caledonia M Co	Nevada	31	50	May 4	June 8	June 28	R Wegener	414 California st
Con Imperial M Co	Nevada	11	10	May 5	June 8	June 23	W E Dean	203 Bush st
Crown Point M Co	Nevada	41	50	May 8	June 11	July 2	J Newlands	203 Bush st
Dudley M Co	California	8	25	Apr 20	May 24	June 22	E C Masten	309 Montgomery st
Equitable T & M Co	Utah	22	10	Mar 22	Apr 30	May 25	O J Collins	227 Montgomery st
Gila S M Co	Nevada	7	25	Apr 20	May 24	June 14	W W Parrish	330 Pine st
Hale & Norcross	Nevada	6½	50	May 11	June 16	July 8	J F Lightener	309 Montgomery st
Independence M Co	Nevada	6	25	Apr 19	May 25	June 14	E M Hall	327 Pine st
Julia Con M Co	Nevada	12	40	May 12	June 16	July 6	H A Charles	419 California st
Jupiter M Co	California	3	40	Mar 31	May 4	June 2	E C Masten	309 Montgomery st
Leopard M Co	Nevada	13	10	Apr 5	May 7	May 28	E M Hall	327 Pine st
Mexican G & S M Co	Nevada	11	1 00	Apr 28	June I	June 21	C L McCoy	203 Bush st
Mackey G & S M Co	Nevada	3	10	Apr 25	June 1	June 21	J M Buffington	309 California st
Modoc Cou M Co	——	9	1 50	Mar 18	Apr 26	May 17	J W Pew	310 Pine st
Monte Christo Con M Co	California	3	10	Mar 19	May 8	June 3	B Burris	309 Montgomery st
North Bonanza M Co	Nevada	5	25	Mar 20	Apr 24	May 25	W W Stetson	309 Montgomery st
Ophir S M Co	Nevada	35	1 00	Apr 10	May 13	June 3	C L McCoy	203 Bush st
Overman S M Co	Nevada	45	50	Apr 6	May 12	June 2	G D Edwards	414 California st
Raymond & Ely M Co	Nevada	14	25	Apr 5	May 10	June 7	W L Elliott	328 Montgomery st
Red Cloud Con M Co	California	7	20	May 11	June 17	July 9	W J Taylor	310 Pine st
Savage M Co	Nevada	42	1 00	Apr 3	May 6	May 26	——	309 Montgomery st
Sierra Nevada	Nevada	63	1 00	April 30	June 4	June 21	D L Parker	309 Montgomery st
Silver Hill M Co	Nevada	10	50	April 14	May 19	June 9	W E Dean	203 Bush st
Scorpion M Co	Nevada	7	40	Apr 26	June 7	June 30	Geo R Spinney	310 Pine st
Solid Silver G & S M Co	Nevada	3	25	Apr 13	May 15	June 5	R Hewson	320 Sansome st
South Bodie G M Co	California	3	15	Apr 8	May 12	June 2	H Deas	309 Montgomery st
South Bulwer G M Co	California	7	50	Apr 2	May 5	May 27	W Stuart	320 Sansome st
South Standard M Co	California	6	20	April 29	June 3	June 23	C A Sunkey	331 Montgomery st
Utah M Co	Nevada	30	2 00	Apr 23	June 2	June 22	G C Pratt	309 Montgomery st
Yellow Jacket M Co	Nevada	37	1 00	May 5	Juno 5	July 7	M Otoy	263 Bush st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Argonaut M & M Co	California	3	1 00	Mar 30	May 1	May 24	J L Fields	240 Montgomery st
Atlanta M Co	Utah	1	05	Dec 23	Apr 29	May 24	A F McGrew	420 Montgomery st
Atlas M Co	Utah	1	20	May 19	June 23	July 14	A F McGrew	420 Montgomery st
Black Rock M Co	California	3	15	Apr 2	May 21	June 21	N T Root	225 Beale st
East Mt Diablo M Co	Nevada	1	10	May 7	June 14	July 6	G W Fisher	324 Pine st
Pintsrolh G M Co	California	3	1 00	Apr 13	May 15	June 1	H King	320 Sansome st
Excelsior Deep Gravel M Co	California	10	10	Apr 21	May 24	June 15	D F Verdeual	327 Pine st
Fairfax M Co	Nevada	2	20	Anr 7	May 26	June 16	O C Miller	324 Pine st
Gover M & M Co	California	42	20	May 5	June 21	July 14	W O Wilson	402 Front st
Hillside M & M Co	Nevada	3	30	Apr 9	May 12	June 7	F Frankcutbal	330 Pine st
Mt Potosi Con M Co	Nevada	3	2 50	May 11	June 14	July 6	E A Holmes	318 Pine st
Murchie G & S Co	California	3	25	Apr 20	May 21	June 21	S D Rodgers	328 Montgomery st
Northern King M & M Co	Arizona	4	20	May 14	June 19	July 12	E A Holmes	310 Pine st
Oro Blanco M Co	Arizona	1	20	May 3	Juue 7	June 28	W O Gould	220 Sansome st
Relief Con M Co	California	1	10	Apr 3	May 7	May 27	W J Taylor	310 Pine st
Republic Con M Co	California	1	10	Apr 3	May 7	May 27	W J Taylor	310 Pine st
Vanderbilt M & M Co	Nevada	1	15	Apr 12	May 20	June 16	J Morzio	328 Montgomery st
Wyoming Coal M Co	Wyoming	2	3	April 21	June 10	July 10	——	——
Wyoming & Dakota W Co	Dakota	2	1 00	May 6	June 16	June 30	T Widman	404 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Excelsior Deep Gravel M Co	California	H Flageman	327 Pine st	Annual	June 1
Foulk G & S M Co	Nevada	A W Rose	302 Montgomery st	Annual	June 1
Florida Hill M Co	Idaho	R Wegener	414 California st	Annual	May 23
Gopher Con G M Co	——	T Widmann	404 Montgomery st	Annual	May 25
Haskin M Co	Nevada	O H Jewell	5½ Kearny st	Annual	May 21
Pioneer Con M Co	Nevada	J M Buffington	309 California st	Annual	May 24
San Carlos Coal M Co	——	A J Koysch	230 Montgomery st	Annual	May 25
Tyho Con M Co	Nevada	W M Parrish	330 Pine st	Annual	June 2
West Side S M Co	California	W M Parrish	330 Pine st	Annual	June 1

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	E M Hall	327 Pine st	20	Feb 26
Black Bear Q M Co	California	W L Oliver	Safe Deposit Bldg	25	May 16
Bodie Con M Co	California	W H Leut	Nevada Block	25	Mar 1
Cherokee Flat Blue Grav M Co	Cal	R N Van Brunt	318 Pine st	4 25	Mar 13
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	May 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	50	Apr 24
Great Western Q M Co	California	A Halsey	312 Montgomery st	25	Feb 3
Idaho G M Co	California	C Meade	324 Pine st	2 00	Apr 9
Natoma Water & M Co	California	——	——	2 00	Apr 5
New York Hill G M Co	——	J B Leighton	527 Clay st	25	Feb 20
Northern Bell M Co	Nevada	W Willis	309 Montgomery st	50	May 15
Ontario M Co	Utah	——	——	50	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12

The Mining Share Market.

The sudden advance in the prices of miuing shares which took place as onr last issue went to press continued to increase toward the end of the week, when a considerable reaction set in. As no apparent development in the mines serves as a basis for tbis sudden improvement in the market, there is mueh reason to believe that the present appreciation is phenomenal. Those at all familiar with such matters know that stocks have periodical freaks, and at times fluctuate greatly at variance with the real value of what may be represented. The market often becomes depressed, and prices fall to a figure that may be much below the real value of the stocks, after which they will rise to a figure mnch beyond the real value. In this recent boom those who got in at the low prices hastened to realize on quick returns and small profits, the particnlar merits of the mines not being taken into consideration, the selection of the stock, in great part, depending merely on the inclination of the purchaser. A strike, however, is reported from the New York mine, in the north drift on the 1600 level, yielding ore assays which show a good prospect for the mine, though big bonauzas are not expected now so much as formerly; people are growing more moderate in their mining desires; hence, small but paying mines on or off the Comstock are now and will in future command attention from investors. As before stated the recently inaugurated movement has for its basis, more a concentration of shares than any development in the mines, and for this cause its duration is likely to be short, resulting in a more extended demoralized feeling than existed before its inception. There are some favorable accounts from parts of the Comstock, but not so exceedingly eneouraging as to justify much higher prices for shares than existed abont one week ago.

A BILL has been introduced in the U. S. Senate to allow the construction, by tho Occidental and Oriental Steamship Co., of a railroad from Green River station on the Union Pacific railroad, to Steilacoom on Puget sound, W. T.

Superintendent's Statements.

Under the Felton act passed by the State Legislature, the superintendents of mining companies, which are incorporated under the laws of this State, must furnish weekly statements under oath, of the progress and development, number of men employed, bullion on hand, etc. From onr mining summary it will be seen that the Comstock superintendents this week began to furnish their statements as required by law. Some of them grumble at the trouble, but as blanks are provided which they fill out, they will soon find it no more trouble than the usual weekly letters.

The public, however, will feel much more confidence in these reports of superintendents than formerly. Under the circumstances they will he extremely careful that no loose statements creep in, and they will not want to swear to statements which other people prepare for them.

Altogether, it seems as if the system would be beneficial in the end. If penple incorporate mines and sell the stock to the public that public has a right to know something about the mine. Until of late they didn't know anything about it unless they had a large "block" of stock, or were on the hoard of directors. The directors "run" the mine in their own interests without the slightest regard to the other stockholders. All this has been douc so often that it has become played out. It was really this feature which has damaged the mining interests so much on this eoast. If at all times stockholders could know the real—not tbe apparent—truth about their properties, it would he better for them and better for the general mining interests. Snperintendents, with the general welfare nf the companies they represent at heart, should rather rejoice that under the new regime snspicion should be lifted from their shoulders as directors, and while they might desire a "coloring" to be given to a letter, could expect nothing nf the kind in a sworn statement.

WORK on the artesian well at Modesto has been suspended. The depth of 1,045 feet was reached.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALAMEDA.

NEW GOLD MINES.—Oakland *Tribune*, May 14: Active preparations are going on for the early working of the gold-bearing quartz ledge recently discovered in the San Pablo range. A blast furnace has been sent out, a camp established, and a mill will soon be erected. The new mining district has been legally organized under the name of the Blue Bell district. It lies on the boundary between Alameda and Contra Costa counties, extending five miles east from said line, its northwestern initial point being at the crossing of the old Martinez road.

AMADOR.

QUARTZ DISCOVERY.—Amador *Ledger*, May 15: Olcta is enjoying a little furore, over the discovery of a new quartz ledge, on Uhlinger's ranch, a short distance from town. We have not heard the size of the vein. Samples of the rock exhibited in Olcta are very rich, and would yield per ton away up in the hundreds of dollars.

ITEMS.—A new shaft, 15 ft in the clear, is to be sunk on the Oaks mine, to the depth of 1,300 ft. The Elephant mine, a mile south of Plymeuth, on the north side of Dry creek, has the appearance of a permanent mine. A large body of quartz crops out on the surface, measuring over 20 ft in width. A shaft is being sunk on the footwall. D. D. Reaves is one of the owners.

A GREAT ENTERPRISE.—The Directors of the Pacific mining company, whose location adjoins the Empire mine, were here and busy all the week in arranging surveys, etc., for the commencement of a shaft upon the ground, and we are informed by responsible parties that ground will be broken next Tuesday for a vertical shaft, to be sunk to the depth of 1,300 ft, before they tap the vein. Heavy machinery will bo placed upon the ground immediately, and work commenced. The company has also laid out a mill site, and expect to bave an 80-stamp mill ready by the time the shaft is completed. This immense enterprise is not on spekulation, for the Empire company has worked up close to the line of this location to the depth of 1,300 ft, and they well knew the immense body of rich ore that waits the signal to bring it from its buried depths. This is by far the largest mining enterprise ever inaugurated in the county, and we wish it great success, as it will directly and indirectly give employment to hundreds of laborers.

BUTTE.

BUTTE HYDRAULIC MINE.—Oroville *Mercury*, May 12: Superintendent Rhodes returned from San Francisco, Tuesday, whither he went Saturday. The flumes and riffles are already to be placed in position, but the present high water prevents operations for the time being. A small clean-up was made last week. The result was very favorable and the prospects of the property are better than ever.

CALAVERAS.

THE GRAVEL MINES.—Calaveras *Chronicle*, May 15: Great activity prevails at present in the gravel mines in this vicinity. The ditch is running full to the brim, the weather bas moderated and everything is favorable to a vigorous prosecution of operations. At Duryea's, the Mammoth, the Bonauza, the Penobscot, the Maison de Sante and Eureka hydraulics work is being pressed forward with full forces of hands and an abundant water supply. The tunnel claims are also being steadily worked, prominent among wbich are the Green Mountain, La Belle France, Rough Diamond and others. Generally speaking, results are fair, and as the water supply promises to continue abundant until late in the season, we think we are safe in predicting an unusually prosperous year for the mining fraternity.

MILL AT THE BOSTON.—We learn that the speedy construction of a fine 20-stamp mill on the well-known Boston quartz mine, in Buckeye gulch, is contemplated. In fact we understand that the lumber is already ordered and the contract let for building it. Mr. John Rider has been employed to superintend the construction. With the aid of a good mill, there is a strong probability that the Boston will develop into a first-class mining property.

CARSON HILL MINES.—Cor. Calaveras *Citizen*, May 15: Carson hill has one of the richest mines in California. Thousands of dollars have been extracted from the mine since its discovery, and yet there never was a mill on it. The present company is now sinking a shaft below the level of their tunnel; they are down to the depth of 70 ft, and intend to sink 80 ft more. The Union mine is still idle, having been bonded several times, but with poor success. The Vanderbilt mine, owing to the wet weather has been lying idle. The company, which consists of farmers living in Modesto, will shortly commence work in earnest to develop the mine. They have a fine prospect and well-defined ledge. A number of smaller mines are being worked with good results. From present appearances, there will be considerable mining done in this county during the summer.

SHEEP RANCH ITEMS.—The Lost Boy mine will resume operations soon. Preparations are now being made. The mill of the Hagin mine was started on Monday morning last. Work was also resumed in the mine. The coming summer will undoubtedly be a lively season to our burg. Prospecting will be resumed by many, and we have reason to believe that several remunerative veins of quartz will be opened. E. Bean and N. Barrow have discovered a lode recently, which prospects favorable. The claim is located on the San Antone creek, near the new road to Murphys.

EL DORADO.

THE GOPHER MINE.—*Mountain Democrat*, May 15: John Sipp, who has a bond of the Gopher and Boulder mines, in Kelsey district, was over to Placerville last week, having just completed a crushing of a considerable quantity of surface rock from the Gopher mine, which netted him a little over $12 per ton. Having freed the shaft of water, he is now taking out rock from the bottom, which will average at least $25 per ton, and for which responsible party has offered him $15 a ton as it lies on the dump. The Gopher is a well-defined ledge at least 4 ft in thickness, and can be tapped at a depth of 350 ft by a tunnel of 300 ft from Irish creek. Thousands of tons of quartz from these 2 contiguous monster ledges—the Gopher and Boulder—can be mined and milled at a very low cost; it certainly will not cost more than $5 a ton, and probably not more than $3, and the natural facilities for extracting a large amount could hardly be improved.

THE DIAMOND SPRINGS HILL MINE.—Hon. S. S. Tilton, of San Francisco, was in town Thursday, having come up for the purpose of inspecting the immense gravel deposit at Diamond Springs, and he thinks he has devised a plan by which it can be worked to advantage. The gold is there if a plan can be discovered for getting it out.

GOOD DUST PURCHASES.—Among other signs of business prosperity and by no means the least significant, is the fact that the purchases of gold dust by our merchant and bankers are exceeding those of any previous period for many years. If we had permission to publish the amount purchased by one house in Placerville between April 10th and May 10th, the figures would very agreeably surprise our readers. They are "away up," and closely approximate the bigbest figures of the "flush times." And this although our mining industries are but beginning to thaw out after an unprecedentedly hard winter. For the forty-eleventh time we repeat our prognostication that the boom is nearly upon us, and "don't you forget it."

MONO.

CERRO GORDO.—Bodie *News*, May 15: The mining prospect at this old and well-known mining camp is good and gives promise of quite a boom the coming season. Messrs. M. C. Hawley & Co., of San Francisco, are now building a new quartz mill at Owens lake, and when complete

e mines will be started at full blast. This will give re-wed impetus to the opening up of many valuable min-g properties, and we may soon expect to hear of the l-time prosperity of that camp.

THOMA CON.—Bodie *Free Press*, May 16: A drift north the vein is now 5 ft. between the walls. The footwall rries a heavy seam of clay, and the quartz in the center very rich. Superintendent Golding considers this a ry important development. The prospects for the vein open out into a large body of ore are very flattering, d the future of the mine is assured beyond a doubt. he west crosscut, 800 level, was only extended 13 ft rce last report. All is now secure and in good shape. e Syndicate tunnel was timbered a distance of 40 ft ring the week.

BONANZA IN THE ORO.—Since the revival of mining erations in the Bodie district in 1877 Silver Hill, the at eminence south of High Peak, has been an enigma, the solution of which the best energies of some of our st enterprising mining men, and thousands of dollars money, have been directed. The richest placer mines this section are found on either side of that hill, and ny other circumstances have extended the most ex-vagant promises of a rich reward for these labors, but till the past winter the destiny of Silver Hill has re-ained undetermined. During the past 2 or 3 months it been known, however, that discoveries of considerable portance had been made in at least two mines on that ll, one of which is the Oro. Mr. Thomas Steel, the perintendent, has been pushing the work of develop-nt with vigor, and having opened up the mine to a fficient extent to present to public inspection, yester-y invited a number of gentlemen to take a look through e workings. The first level is at a depth of 230 ft from e surface, and on a plane with the Silver Hill tunnel, oed by the same people as the Oro, and with which it ll eventually be connected. The work on this level nsists in a crosscut west 357 ft and east 188 ft. Seventy-e ft from the shaft in the west crosscut the Walter ige was intersected. This ledge where cut is 16 ft in ith. The second level is at a depth of 340 ft. Here Walter ledge was cut 25 ft west of the shaft. It was about the same width as on the level above, but proved incalculably as to quality. Next to the clay ing on the hanging wall side are several layers of utiful ruby silver quartz, the ruby showing all through e splashes of blood. The shaft is now 400 ft deep, and being continued down. A visit to the bottom disclosed e fact that it was passing through the ledge, and yester-y the full 8 or 9 ft of excavation at the bottom was in e. It is generally known that the Walter ledge was cut a west crosscut, 675 ft in length, from the Maybelle ne, and that the outcrop of the vein was within the ria ground, lying west of the Oro.

EVADA.

A LEDGE THAT IS EASILY WORKED.—Nevada City *Tran-ript*, May 14: About 3 years ago, Frank Souchet located old-bearing ledge lying 1½ miles northeast of North oomfield, and adjoining the Mount Blanc claim. He a tunnel to tap it, but owing to the lack of timbering e workings caved in. He next constructed a ditch and ound sluiced. Thus the ledge, which averages some 8 in thickness, was opened for a space about 100 ft wide d 75 ft deep. It is estimated that the amount of ore ow in sight is 2,000 tons, and the owner says it can be ucked out and hauled to the mill site for 50 cents a ton. has prospected it in numerous places and found every-ere enough gold to satisfy him that it is good milling . Five tons of it is being extracted at present and will brought to this city and worked as soon as the roads e tle. Mr. Souchet's location consists of 3,000 ft on the dge, and his claims are termed the Bunker Hill and ichmond. The property includes a water right that es 200 ft pressure, and considerable heavy timber.

SANDERS & JACOBS' MINES.—The Sargent & Jacobs roperties at Quaker hill are in a prosperous condition. ere are 20 men employed in the drift mine. Monday a nnel 20 ft below the upper one was started. The daily tput of gravel is about 50 tons. This is breasted out, ted through the shaft, crushed and the whole process working gone through with at a cost of about $1.50 a . In spots the cement has paid as high as 25 cents a und, and the general average has been of a satisfactory aracter. It is believed that the new drift will disclose ch richer gravel than does the one 20 ft above, as the ter evidently extends along a bench or bar in the dead er. The machinery is all run by water. There are 3 rdy wheels—1 for the mill, 1 for hoisting and 1 for mping; all but the latter are stopped Sundays, when e employees take a Christian-like rest. The company's draulic mine, close by, also keeps about 20 men busy. ere are 2 monitors in use. Operations are not sus-nded here at any time, as even an hour's delay would rmit much water to run to waste. Some trouble has en experienced by a slide in the road that prevents tim-r being readily hauled to the working.

THE IRON CLAD MINE.—Nevada City *Transcript*, May : The Iron Clad mine is situated 1 mile south of Rough d Ready. Under the management of Mr. Cammet it become well known throughout Nevada county. The aft is down about 150 ft, and has a well-developed and ineral ledge between 2 and 3 ft wide, running northeast d southwest. The company has let a contract to sink ft more. They intend at the completion of the con-act to run drifts and cut the adjoining ledge, which runs arallel with the main ledge. The rock taken out says for e sinking. We were shown pieces of quartz weighing tween 40 and 50 pounds, in which free gold could be ite readily seen. There is a 5-stamp mill on the mine. he intention is to erect 25 stamps more this summer. here is also a patent furnace for roasting sulphurets. he rock is paying $30 and $40 per ton. Mr. Cammet has en at work over 2 years in developing this mine, and has ent a great deal of money, and at last his efforts are owned with success.

A NEW MINE.—James Spargo a few weeks since located ledge lying between the Providence and Black Prince laims, striking good ore at the grass roots. He finally ent down the hill where he started a tunnel. After run-ng about 6 ft, the ledge was found to average from 18 to 0 inches thick, and a well-posted, practical miner work-g in that vicinity says the ore is literally filled with old. There are at present 3 men working in the claim, nd another shift is to be put on soon. A 4-stamp mill as been procured, and is being erected. The mill will be un by water power. Several men employed along the reek say they believe Spargo's strike is one of the best ver made in that part of the district.

THE FORTUNA MINE.—The building over the hoisting orks of the Fortuna mine had advanced to a stage of ompletion last night that will insure against further de-ays in progress by bad weather. This week steam will be tarted. After the water has been pumped out, the shaft, hich has a depth of 130 ft, to which point it was sunk y the former owners, will be pushed down 70 ft further, here the first drifts will be run. While ore is being aken from the 200 level, another level 100 ft lower will be unk for.

TUOLUMNE.

MINES SOLD.—*Union-Democrat*, May 13: Three quartz ines were sold last Wednesday to the Boston, Pacific ining and investment company. The Evans mine, 0 iles above Sonora, the Hazel Dell, adjoining the Evans, nd the Mastodon, near Cherokee, were the properties isposed of. The parties representing the company, hrough whom the purchases were made, were Thomas B. owns, Vice-President, and Major David T. Bunker. These entlemen state that it is the intention of the corporation o carry on a heavy business in this line on this coast, pay-ng particular attention to the mining interests of Tuol-umno county.

NEVADA.

WASHOE DISTRICT.

INSTEAD of writing the usual weekly letters on the ines, the Superintendents made out, for the week end-ng May 15th, the "sworn statements," which are required nder tha new California law. The "sworn statements" are principally in tabular form—printed blanks that are filled out with figures representing the number of ft that the several drifts, crosscuts, winzes and other openings have been advanced during the past week. Instead of giving our usual "summary" this week, we give the state-ments, since they will show number of men employed, ete.:

UTAH.—Miners, 39; surface men, 0; engineers, 3. South drift, 1750 level, extended 20 ft; total length, 430 ft. East crosscut No. 2 extended 16 ft; total length, 76 ft. Main incline sunk 12 ft; total length below the 1950 level, 76 ft.

SIERRA NEVADA.—Miners at work, 130; engineers, 7; firemen, 3. West crosscut on the 2300 level advanced 30 ft during the week. North drift on 2400 level advanced 45 ft; east crosscut from east winze advanced 12 ft. The station for the hoisting engine to hoist from the 2500 level has been completed. Station on the 2400 level, at east winze, retimbered.

UNION SHAFT.—Miners at work, 104; surface men, 83. Sinking the shaft has been resumed; are cutting out bob-pit at 2400 level, easing timbers and repairing hoisting engine.

UNION CON.—Miners at work, 153; surface men, 9. Ore is being extracted on the 2300 and 2400 levels. No. 2 winze, 2400 level, sunk 6 ft. Northwest drift on the 2500 level, from No. 1 winze, extended 29 ft; south drift from same winze extended 16 ft. During the week 482 tons and 800 pounds of ore have been extracted, and 600 tons milled, the assay value of which was $28.43. Bullion on hand, $24,421.39.

MEXICAN.—Miners, 58; surface men, 14. On the 2300 level are enlarging and retimbering the main lateral drift. The joint Ophir winze has been sunk 14 ft. The north lateral drift, 2500 level, extended 26 ft.

OPHIR.—Total number of men employed, 134; miners, 73; surface men, 11; laborers, 10; engineers, 10. Ore is being extracted on the 2100 level. Amount of ore extracted during the week, 114 tons 600 pounds; sent to mill, 100 tons 1,700 pounds; assay value not yet received from mill. On the 2300 level joint Mexican east drift extended 14 ft; north drift on 2500 level extended 30 ft; joint Mexican east crosscut on this level extended 20 ft; east drill hole, 2500 level, extended 180 ft.

CALIFORNIA.—Ore is being extracted on the 1500, 1650 and 1750 levels; winze on 2000 level sunk 9 ft; north lateral drift, 2300 level, extended 4 ft; 707 tons of ore extracted and sent to the mills, assaying $28.78.

CON. VIRGINIA.—Ore is being extracted on the 1650 and 1750 levels; the joint California crosscut, 2300 level, extended 21 ft; south drift, same level, advanced 13 ft; drain tunnel to Sutro branch tunnel completed; 1,383 tons of ore extracted and sent to the mills; assay, $51.06.

C. & C. SHAFT.—Miners employed in California and Con. Virginia, 30; surface men, 32. Shaft sunk 8 ft; total depth below 2300 station, 54 ft.

G. & S. AND B. & B. SHAFT.—Men employed, 48; sunk and timbered shaft, 30 ft; total depth, 1,125 ft.

HALE & NORCROSS.—Engineers, 3; firemen, 3; surface men, 18; miners, 33. Main incline, 167 ft on slope below 2200 level; placing air pipe in north drift, 2100 level; repairs made to main shaft and incline; overhauled V-bob; temperature, 2200 level, 116°.

CHOLLAR.—All work done through C. N. S. shaft. This shaft is not an incorporation, hence escapes the provisions of the Felton bill. Regular statements will, however, be made when work in the south drift is resumed. Yesterday a strap of the pump rod of the shaft broke and delayed pumping, but was repaired and pumping resumed last evening. No change in the flow of water into the shaft.

BULLION.—Miners, 29; surface men, 19; diamond drill run on the 2350 level; 2450 level, 25 ft run east. Joint Julia shaft sunk 25 ft.

CON. IMPERIAL.—Engineers, 7; miners, 18; surface men, 11; completed 200 ft of drain in main lateral drift, 2800 level; still at work on it; also repairing and retimbering drift.

CROWN POINT.—Men employed, 39. Incline winze sunk to a point 25 ft below the 3000 level for sump; 3000 station completed; dimensions, 25x9x10 ft; drift started east and run 18 ft; place 14x4 cut out for blower engine.

BELCHER AND JOINT SHAFT.—Men employed, 84, viz.: Miners, 44; carpenters, 2; blacksmiths and helpers, 4; machinists, 2; engineers, 10; firemen, 6; pump men, 2; top men, 14. The north drift on 3000 level, to connect with Crown Point winze, was advanced 35 ft, making its total length 75 ft from incline. The drill in the face of cast crosscut No. 2 was continued a further distance of 5 ft and was then stopped on account of the heavy flow of hot water. This, together with handling the water and making some needed repairs through the mine, was all the work done during the week.

OVERMAN.—Miners, 24; station tenders, 3; carmen, 2; watchman, 1; chief engineer; engineers, 3; firemen, 2; blacksmith and helper; machinists, 3; machinist's helper; foreman; shift bosses, 3; carpenter; repeman and assistant; oiler, woodman, clerk, surveyor, attorney. Crosscut No. 3 has been extended 15 ft through hard porphyry and discontinued. Crosscut No. 4, 150 ft south of winze, has been extended 18 ft. Drift west from upraise, from 700 level, has been extended 41 ft. Forman shaft has been sunk and timbered 25 ft; total depth, 1,075 ft.

CALEDONIA.—Miners, 12; watchman, 1; chief engineer; engineers, 2; machinist and helper, 1; foreman, 1; pumpman, 1; clerk, 1; surveyor, 1; attorney, 1. South crosscut has been extended 34 ft through hard porphyry that does not blast well. Forman shaft has been sunk and timbered 25 ft; total depth, 1,075 ft.

SUTRO TUNNEL.—Made in north header, 80 ft; total from C. & C. shaft connections, 150 ft. South header made 65 ft.

BRISTOL DISTRICT.

LIVELY.—Pioche *Record*, May 15: Upper Town, at the mill site of the Bristol silver mining company, presents a lively scene, everybody as busy as bees. The ground is strewn with lumber and heavy machinery, and work in general is being vigorously pushed ahead. The artesian borer is doing good work, and is down 140 ft with 80 ft of water. The large excavation for the reception of the mill has already been completed. A kiln of 100,000 bricks, to be used in the construction of the same, will soon be fired, and other improvements are under way, including that of a large 2-story building, the private boarding-house of the company, and containing the private rooms, offices, etc., to be hard finished throughout, and when completed will be the finest of its kind in the State.

THE Meudha, of the Hillside company, is continually improving, the shaft at 120 ft is all in ore with no walls. The drift from the 100 level is carrying ora full in the face with an average assay value of $50, and from 20 to 25 tons are daily being shipped to the furnace.

CUSTOM ores are coming in rapidly; the Day is shipping 10 tons per day of high-grade ore, and the Midnight, of Blind mountain, have already on the furnace dump a good many tons of their first-class rock.

A LARGE amount of machinery for the Bristol company has been coming in the past few days.

THE Hillside furnace is turning out large quantities of bullion, running it out much faster than teams can haul it away. The dump is covered with it in huge sacks, awaiting shipment.

THE streets are crowded with teams bringing in machinery, etc., and going out laden with bullion.

I X L DISTRICT.

STRIKE.—*Silver State*, May 17: A rich strike is reported to have been made last week in the Bayfield mine, in I X L district. The ore assays high, and there is plenty of it. Well-informed citizens of Churchill county, in which the mines are situated, a short distance south of the Humbolt line, predict that there will be over 1,000 voters in the county in less than 2 years.

SCHELL CREEK DISTRICT.

STARTING UP.—White Pine *News*, May 12: On Monday last articles of incorporation of the Woodstock Con. Silver Mining Co. were filed in the office of the County Clark, with the following directors: E. B. Dickinson, of Shellbourne; Frank B. Dole, John J. Hayes, John D. Morton, Monroe T. Quimby, Jonathan R. Gay and Edward F. Hagar, of Boston, Mass. The object for which the company is formed is the mining and milling of silver ores and conducting generally all work incidental thereto. Capital stock, $1,000,000, divided into 100,000 shares, of the par value of $10 each. Principal place of business, Schellbourne, White Pine county, Nevada. The company is incorporated under the laws of this State, by a number of Boston capitalists, who are already largely interested in mines in White Pine county, notably the Bay State mine at Newark and the Trench mine in this district. The Woodstock Con. company has purchased a number of mines in the Schell Creek mining district, and, we understand, will soon commence work upon them. Eastern White Pine seems to be attracting the attention it so richly merits, and the coming summer will see a great advance made in the mining interests of that quarter.

ARIZONA.

MONTEZUMA DISTRICT.—Yuma *Sentinel*, May 15: The new copper mines in the Montezuma district, southeast of Castle Dome, are making a good showing. On the "Echo" a shaft 10 ft deep has been sunk, and crosscutting 20 ft partly across the vein, which is over 40 ft wide, over 10 tons of ore are on the dump, and a shipment will be made immediately.

COPPER.—*Record*, May 15: The Bronco copper mine, in the Pinachuca mountains, is being worked and showing up finely.

SILVER DISTRICT.—Cor. Phœnix *Exponitor*, May 14: I am glad to record the fact, as reported here on excellent authority, that Mr. J. D. Wilson, in the interest of some New York parties, has purchased the bond of $100,000 on the Red Cloud mine, from the Iron Cap company, for $15,000, and will open up on that magnificent property with a force of 60 men. When this mine is developed, there is not a better property known in the Territory. The Emma has shut down for a short time. The Iron Cap is turning out plenty of rich metal. Mr. Sumner has sold one-half of the Mariaura mine for a 100-ft shaft, to be sunk thereon. The parties are highly pleased with the present prospect. The Jackson furnace extracted 34 ounces of silver and 450 pounds of lead from 1,000 pounds of Princess ore this week.

GLOBE DISTRICT.—*Silver Belt*, May 14: Silver glance in quartz has appeared in the Buffalo shaft at a depth of 111 ft. An unusually rich strike has been made in the Nugget, in new shaft at a depth of 55 ft. Ten thousand pounds of Townsend mill machinery was delivered by Buckslew & Ochoa on the 6th. Sinking for water at mill site was commenced Tuesday. The completion of these mills will very greatly increase the shipments of bullion from Globe. Work on the Antler and Washington has greatly delayed by contract freighters. The much needed hoisting works were shipped in San Francisco on the 15th of March. Mr. Clark supposes that the machinery is on the road, somewhere between the railroad and the mines, and would be glad to be informed just where.

DAKOTA.

SILVER PLUME.—*Black Hills Times*, May 12: The Silver Plume mine, on Bald mountain, is one of the best locations in that district, and has shown some of the best ore that has ever been found up there. This mine has been purchased or bonded by a company of wealthy Eastern capitalists, and a Mr. Brickerdiko has come on and taken charge of the mine as Superintendent. He is working day and night shifts, and proposes, if necessary, to run the tunnel clear through the mountain. He has procured enough T rail iron to lay a track 250 feet, and thinks that distance will strike the ore body. The track is now 170 ft, and the mine is well supplied with cars of the best make. This tunnel will be driven in 300 ft, if the ledge is not sooner found. Some fine bodies of ore have been found at this distance.

NEW MEXICO.

EUREKA.—Cor. Silver City *Herald*, May 12: The California mine is looking well, with a shaft down 13 ft and some good ore in sight. J. W. Jones has discovered another mine that has been walked over hundreds of times by all in the camp, and a party looking over the dump says he can see free gold in the rock. Howard & Co. commences work shortly on the Julia, and the camp is now putting on a lively appearance. As I think few persons know the extent of this belt, I will state that mineral is discovered for a distance of 15 miles 1 way by 3 miles the other, and the camp is not ¼ prospected as yet. There is room here for 1,000 men to prospect with a certainty of finding ore.

GEORGETOWN.—The Mimbres mining company (this is the name that the company who purchased the Naiad Queen, McNulty, etc., has adopted) has taken out a considerable amount of ore during the month of April, some of which has been very high grade. They are working the Naiad Queen only at present, which mine is yielding ore in abundance. Seventy-five men may be worked profitably in this mine at present. The Commercial, which lies contiguous to the Naiad Queen, is turning out some very good ore. Kelley & Orwin, who are leasing on this mine, have struck a large body of very fine ore. The McOregor is also looking as well as ever, and is turning out its usual quota of rich and very free ore. Bracaw & Perry, who are still leasing on the McNulty, are taking out good ore in large quantities. Helde & Slosser are now sinking on their Bobtail mine in the same locality. They have good-looking ore on the surface, and the formation is same as above. Lucas & Holmes will commence work on the St. Louis, located about 3 miles north of this place. We think that no place in the country offers greater inducements to capitalists for investments in mining property that will pay than Georgetown and immediate vicinity, judging from the fact that our mines have ever been self-sustaining from the time that the first pick was stuck in them until the present. It is true we are a little off of the regular stage route, but they might go farther and fare worse in their search of paying mines.

UTAH.

STOCKTON MINES.—Cor. Salt Lake *Tribune*, May 15: With the advent of genuine spring weather we are pleased to note the real beginning of a real boom in this camp. All this, notwithstanding the oft repeated sayings of old Pacific slopers that the Stockton ores were all surface deposits and had no depth to them. It would certainly astonish some of our old friends who hold that opinion to come here and go down into the Great Basin, Calumet, Leonore, Rush Valley, Reno, Josephine and other mines that are going down and finding ore as they go. The Basin main shaft is about 550 ft down, and they have a six-ft breast of ore at the bottom. Gen. Connor, managing director, is at present putting in an 80-horse power engine and boiler at the old Longmaid smelter. He has six of the latest pattern of improved jigs and two crushers, with which he will concentrate from 40 to 50 tons of ore per day. He is preparing to rebuild one of the old stacks to smelt the Basin, Rush Valley and Silver King No. 2 ores. The Leonore mine, on the northwest side of the same hill containing the Great Basin and National, was bought by Mr. Humphrey a few weeks since for $10,000 cash. The Leonore is going down at the rate of 3 ft per day, and has about 40 tons of $50 ore on the dump. The Reno is paying handsomely of late. This camp is employing about 150 men at present.

BIG COTTONWOOD.—Our winter in Big Cottonwood has been the longest and severest that old timers can call to memory. Snow has fallen in the head of the canyon to a depth of 12 to 15 ft, and has impeded mining operations materially. Mining operations during the winter have been carried on as extensively as the weather permitted, and shipments of ore from the principal mines were carried on until about the 15th of March. We learn that the head of Big Cottonwood is becoming an attractive field for prospectors, owing, perhaps, to the Ontario belt crossing the canyon, taking a southeasterly course, touching at the head of Snake creek and continuing toward American Fork canyon. Several prospectors have sunk shafts through the snow in order to obtain a peep of "Adam's land" which resulted in locating the ground. Scott Hill, which was in so active operation several years ago, has again resumed activity. The Elgin is producing considerable good ore similar to the Ontario. The Prince of Wales, Butte, Oregon and others have worked a moderate force all winter and have considerable ore ready for transportation. The Kesler mines have worked a good force all winter and taken out considerable ore. Shipment will be continued by June 1st, or as much earlier as the snow leaves us. The Reed & Benson has produced a large quantity of high grade ore this winter from the Ophir, and shipment will be resumed at an early date. The Thor has worked a force all winter and made important connection by tapping the main ore vein with a tunnel. Some good strikes were made and several tons of $130 ore extracted. The Maxfield, at Argenta, is improving immensely. Shipments of $100 ore have been in progress most of the winter, but owing to the water, operations on the mine have ceased temporarily. The management of the Fairview, Red Pine and of other good looking mines situated in proximity to the Maxfield, contemplate working extensively. There is considerable excitement regarding the recent discovery of a gold belt some 4 miles above the mouth of Big Cottonwood, extending southward toward Little Cottonwood canyon. Two or three companies are prospecting here with flattering results. Several locations have been made and the gold-bearing quartz assayed with a production of over $25 in gold.

BINGHAM.—The Mineral Point company are taking time by the forelock and have already commenced operations. This company possesses some of the finest gold property in Bingham, and situated in the very heart of the great gold belt. Their mines consist of the Prescott, Baby, Vere, General Shelby, Woodman, Stephenson, Junction, Mat Disborn and Zaidee, all comprised in one group. The Baby, Shelby and Vere appear to be the most valuable of the group, and join each other. A continuous vein of gold ore has been exposed, averaging from 20 to 60 ft wide. The veins of this property outcrop considerable, and the principal work now in progress is stripping the veins. As soon as this work is performed it is the intention of the company to put on a large force of men. The Overland is receiving a thorough overhauling in the way of timbering, etc. Mr. Blenney is determined to have his mine in good shape for spring operations. Stewart No. 1 mill is taking a rest, it is said, for repairs, only a few men are working on the mine. Stewart No. 2 mill has not yet started, the roads not being sufficiently good to warrant hauling at the mine. Dave Buel has received the appointment of General Superintendent, with Colonel Hudson as Superintendent. Work so far has not been commenced in earnest. A shaft is being sunk on the ledge. Jennings is pushing his tunnel ahead in Carr Fork. It is now in about 600 ft. The Agnes is working on lease by Hank Crismon & Co. Ore does not seem to be very plentiful, but what is obtained is of high grade. The Harriet has a number of men at work taking out gold ore, some of which runs out high. Foley and Jordan are working the Ten-forty. They have recently struck some high grade lead ore. McCourt is working the Neptune, and has recently struck a nice body of first-class and jigging ore. Mining timber is in great demand, but the roads are in such an outrageous condition that it is almost impossible to get a wagon over them.

Utah's Mineral Wealth.

The acknowledged superiority of Utah in the matter of gold and silver mining, and the attractions connected with a search for the precions metals, have tended to keep in the background her greater riches in the line of usefnl hut less showy mineral. As an iron and coal producer this Territory is destined to become famous. In this contry, as in England, these two great sources of mineral wealth exceed all others in magnitude and importance. Then we have within our boundaries abundant and varied deposits and veins of mineral which in their crude state enter into the manufacture of necessary, useful and ornamental articles. Prominent among these deposits are the heds of fine kaolin or porcelain clay, suitable for manufacturing white or granite waro equal to the best of English make. Feldspar, quartz and silicious sand with which to temper and glaze such ware are found contiguous to thc clay heds, and of the finest quality. All the necessary material for a large and profitahle manufactory of white porcelain ware lies unused and in abundance within from ten to thirty miles of this city, and the wonder is that capitalists at home or ahroad have not ere this secured these treasures and estahlished snecessful potteries here.

What has been said of crockery ware holds good with regard to tho manufacture of glass in all its forms. The hest of materials for this purpose exist in ahundance at our very doors. Fire clay, capahle of withstanding the severest applicatiou of heat, is now heing made into the hest of fire brick, and the manufacture can be indefinitely extended. Material for the manufacture of paints and pigments is ahundant and easily accessihle. Marhle, alahaster, gypsum, hismuth, sulphur, salt—in short, nearly, if not qnite, all the materials of practical use are stored up in vast quantities within the hill and mountain rangos of Utah. It is but a question of time when, with the extension of our railroad system and the influx of capital and population, these waiting elements of wealth will become active factors in solving the problem of material prosperity and political regeneration so intimately connected with the futuro of this Territory.—*Salt Lake Tribune.*

THE BEAUTIES OF GUNNISON.—A letter from Denver was received in town on Saturday from one of a party of twenty or more Black Hillers, hound for Gunnison, whose rendezvous for the present is at the American house in that city. This party writes that the deep snows will prevent their getting into the Gunnison country for a month, perhaps six weeks more. Since this letter was written a violent snowstorm has raged from eastern California along the line of the Uuion Pacific road to Laramie and up to Cheyenne, extending south and north of the line of the Union Pacific from forty to eighty miles. This snowstorm is represented to have heen the heaviest for years, the drifts in some places in the mountains being twenty to thirty feet. Before the late storm Gunnison had snow ennugh to prevent emigration into that El Dorado, but with the fresh instalment it is probable this country will admit of mining operations near or ahout the next fourth of July. A few months after that the snows will come again, and then Gunnison will he locked up until another year comes around.—*Colorado Miner.*

Shell-lac and Lac Dye.

In order that onr readsrs may learn the style of the plant *Larrea Mexicana*, and of the deposit upon it, we have had an engraving made of two twigs, one showing the plant in its healthy stats, the other as it appears after the heavy coating is fixed upon it by ths insect. Former articles pnhlished in the PRESS from the pen of Hon. B. B. Redding, have given descriptions of the plant, and the manner of its occurrence. Since it was first made known as a material worth an effort to gather and market, there has besn received farther information concerning the plant and the hahits of the insect. Mr. Redding, who has just returned from a trip to Arizona, assures us that he saw plenty of the shruh everywhere on the line of the railroad ahove bottom lend. At a great many stations there is no other shruh in sight. Mr. Redding thinks the collecting of the lac could prohahly he made profitahle in the vicinity of Stanwix statiou and Texas Hill, hetween 60 and 100 miles east of Yuma. He learned from psrsons there that nearly all of the plants on the mesa lands ahove Salt river contained lac in quantity. The conclusion to which Mr. Redding arrived from his examination is, that whilc ths plant is ahundant almost everywhere in Arizona, yet there are certain localities where the insect is very prevalent, and where, without douht, good wages conld be made in collecting the lac, whils in other places the lac could not he found on more than say two out of every ten bushes. Mr. Redding was informed that the Indians use lac dye extensively in painting their faces, and in other ways. The Indians state that it would he mnch more readily found in about three months. Nearly all that is found now is lac from last year. The Indians also state that when the lac hardens in the fall on the hushes, a great deal is broken off in the winter by the winds whipping the hranches.

It appeers from a paper reed hy Prof. Stillman at the last meeting of the Academy of Sciences that a similar gum appears on the so-called "cat-claw" of Arizona. Twigs of that plant, which has been identified hy Prof. Hilgard, as the *Acacia Greggii*, a deciduous shruh or tree common in Arizona and Mexico, were coated with a scantier depoeit of the gum than the twigs of the larrea possessed, and the irregularity of the surface of the resin also appears to indicate that the acacia does not present so favorahle conditions for the production of the resin as the larrea.

In its general properties and chemical reactions, the lac from the acacia agreee with that from the larrea, hut the amount of coloring matter is decidedly less. The epecimens of acacia-lac were collected during the season when the twigs were dry and the leaves dead, and none of the specimens examined contained the masses of eggs with red juice in the cells. The cells were dry and contained only the dried or nearly dry sacs. It is therefore not improhable that if collected at other eeasons the dye would he present in greater quantity.

In order to make our ehowing of the ehell-lac and lac-dye interest more complete, we shall give some interesting information of the methods employed in the important lac industry of Asia. These facts are fresh, as they are taken from a work puhlished the present year in London, entitled "Jungle Life in India," written hy Valentine Ball, member of the Geological Survey of India:

"Lec (or as it is called in Hindustani, *lah*) ie eecreted hy an insect (*Coccus lacca*) on the branches and twigs of certain jungle trees. The principal of these are the khusum (*Schleichera jujuga*), plas (*Butea frondosa*), and hier (*Zizyphus jujuba*). The lac from the first-mentioned, the khusum, is more highly esteemed than that from the others. To some extent the lac ie found occurring, so to epeak, spontaneously, and ie collected hy the forest tribes, and hrought hy them to the fairs and hazaare for sale. Where, however, there is a regnlar trade in stick-lac, propagation of the insect is eystematically carried on hy those who wish for a certain and ahundant crop. Thie propagation is effected hy tying small twigs, on which are crowded the egge or larvæ of the insect, to the hranches of the above-named epecies of trees. These larvæ are technically called 'seed.' The larvæ shortly after sowing epread themselves over the hranches, and, taking up positions, eecrete around themselves a hard crust of lac which gradually spreads till it nearly completes the circle around the twig. At the proper season the twigs are hroken off, and we must suppose them to have passed through eeveral hands, or to have been purchased directly from the collectors by the agents of the manufacturer. On arrival at the factory, they are first placed hetween two powerful rollers, which, hy a simple arrangement, admit of any degree of approximation. The lac is then crushed off and is separated from the woody portions hy screening; it is next placed in large tuhs half full of water and is washed hy coolies, male or female, who, standing in the tuhs, and holding a har above with their hands, stamp and pivot ahont on their heels and toes until, after a succession of changes, the resulting liquor comes off clear. Of the disposal of the liquor drawn off at the successive washings I shall speak presently. The lac having heen dried is placed in long cylindrical hags of cotton cloth of medium texture, and which are about ten feet long and two inches in diameter. These bags when filled have somewhat the appearancs of an enormous Bologna sausags. They are taken to an apartment where there are a number of open charcoal furnaces. Before each of these there is one principal operator and two assistants. The former grasps one end of the long sausage in his left hand, and slowly revolves it in front of the fire; at the same time one of the assistants, seated as fer off as the sausage is long, twists it in the opposits direction. The roasting hefore the glowing charcoal, soon melts the lac in the portion of the hag nearest the operator's hand, and the twisting of the cloth causes it to exude and drop into a trough placed helow. The troughs which I saw in use wsre simply leaves of the American aloe (*Agave Americana*). When a sufficient quantity, in a molten condition, is ready in the trough, the operator takes it up in a wooden spoon and places it on a wooden cylinder some eight or ten inches in diameter, the upper half of which is covered with sheet hrass. The stand which supports this cylinder gives it a sloping direction away from the operator. The other assistant, generelly a woman, now steps forward holding a strip of ths agave or alos hetween her hands, and with a rapid and dexterous draw of this the lac is spread at once into a sheet of uniform thickness which covers the upper portion of the cylinder. The operator now cuts off the upper edge with a pair of scissors, and the sheet is then lifted up hy the assistant who waves it ahout for a moment or two in the air till it bscomes quite crisp. It is then held up to the light, and sny impurities, technically "grit," are simply punched ont of the hrittle sheet by the finger. The sheets are laid upon one another, and the tale, at the end of the dey, is taken, and the chief operator paid accordingly—ths assistants receiving fixed wages. The sheets are placed in packing-cases, and when subjected to pressure hreak into numhers of fragments. In this

TWIGS OF LARREA MEXICANA AND DEPOSITS OF GUM-LAC.

fresh etate the finest quality ie a very heantiful object, having a rich golden luster. On seeing it thus, one cannot help feeling regret that it ie not nice to eat—the hest Everton toffee never looked more tempting. The ahove is the history of shell-lac, from its birth in the jungle to its appearance in the world as the commercial article. From the manufacturer it passee through the broker'e hands to the merchant, and from him again to the manufacturere of varnishere, sealing-wax, and otber commodities of which it is an ingredient.

"The dark red liquor resulting from the washing ahove descrihed, is etrained, in order to remove all portions of woody fiher and other foreign materials. It is then passed into large vats, where it is allowed to settle; the sediment is subjected to various washings, and at last allowed to eettle finally, the supernatant liquor heing drawn off. The eediment, when it is of the proper consistency, is placed in presses, from which it is taken out in the form of hard dark purple cakes, with the manufacturer's trade-mark impressed upon them. This constitutes what is known as lac-dye. By the addition of mordants, this dark purple eubstance yields the most hrilliant scarlet dyes, which are not inferior, I believe, to those produced hy cochineal. The dye which is thus separated from the lac hy washing, is said to he the body of the insect, not a separate secretion."

WORK on the Epley mine was commenced last Tuesday, under the direction of Prof. Thomas Price, of San Francisco, and will he vigorously prosecuted henceforth.

THE Original Amador mine is still closed down, hut it will no douht he etarted up again in a ehort time.

Base Ores.

The question has of late been frequently asked: "What is to he done with the hase ores recently found on the Comstock?" The answer is: "They will he reduced." The subject is exciting considerahls interest here just now and is assuming some importance.

The Alta ore is not all hase. The top of the hody only has heen explored and that hut partially. Still enough has heen done to warrant the conclusion that the ore hody will pay for mining and milling and something more. The ore hody was cut for a distance of 55 feet hy the south lateral drift. Crosscnts have shown it to be 24 feet wide.

But, as stated above, this is not all hase. One-half of it is free-milling ore. There will be no need of concentrators to work it. The richest portions of the vein lie in streaks and hunches. The formation pitches down in so marked a manner that further explorations alone can tell its reel value. But thcre is a valuahle body of the hass ore there hesides the free-milling portion of the vein.

The hase ore in Alte is regular smelting ors, carrying from 55% to 72% of lead and a sufficient amount of iron to flux the whole. It aleo aesays well in silver, lightly in gold. The free-milling ore is low gradc, averaging ahout $30 per ton.

In North Bonanza there is a large quantity of hase ore. The hody was struck on the 300 level, and extends certainly 600, and prohahly the hulk of the formation has not yet heen reached. Men are at work in the croppings, too, and are getting ores which run from low grade to $200 and $300 per ton. On the 400 level the ore hody is certainly 70 feet long and 30 feet wide, and its real length is not yet determined.

Here, then, is ore enongh to make it an ohject to have it reduced. The plan proposed is to use concentrators first and theu mill. There is no difficulty in this, since the experiment has been tried and found to work well.

Since neither of these ore bodiee have heen efficiently developed to enahle one to determine their extent, all endeavors to estimate the yield of the base ores are useless. They are certainly worth reducing.—*Gold Hill News.*

THE FASTEST ENGINE.—The Baldwin Locomotive Works have jnst turned out a very remarkahle specimen of locomotive work, which is guaranteed to make 90 miles within 90 conecutive minutes. This engine is to be placed upon the road hetween Philadelpbia and New York, and is to make the distance—90 milee—with its train of cars in one hour and a half. Should this attempt prove successful, other engines of the same stamp will be huilt.

THE Manzanita gravel mining company, to work a mine near Nevada City, has heen incorporated under the laws of New York, with a capital stock of $250,000.

Mining in Bodie.

Previous to the past summsr says the *News*, mining in Bodie was conducted in the most primitive manner by all on the great lods except two or three companiss. During tbe past season the usual appointments necssary for the rapid and economical development of mining property were placed upon a lergs numhsr of our claims. Heavy hoisting machinery superseded the windlass and whim, and as the water levels were reached and the sbafts advanced in depth, the flow becoming strongsr and stronger, the water tubs were superseded hy powerful steam pumps; and they, in thsir turn, are now heing replaced by either large Cornish pumps or ths direct-acting compound expansion engine and hucket pumps that hid fair to replace all other pumping machinery for deep mining. Our companiss no longer scratch upon and near the snrfacs, expecting to find large ore bodiss; hut with the trne miner's instinct and knowledge are following the scams and stratas of rich ore to such depths as will give assurance of finding heavy hodies of pay ore. To-day ws havs 31 steam hoisting works all actively engaged in this commendahle work and in the most scientific manner sinking two or three-compartment shafts to the lower depths. Our mining works are now equal to any found on the coast, their power and qnality heing a living assurance to all that the men interested have full and unlimited confidence in the mining outlook and the solid merit of our mines. The coming season will witness the uncovering in Bodie of mines rich in silver and gold and of such proportions that the far-famed Standard will hs eclipsed. Silver Hill, the great center of Bodie's wealth, will he pierced at all points. Her ledges will be opened, heing in size, strength and quality with the Comstock, and that too before meny months shall have passed. The Addenda, the Oro and the North Noondey will each speak its piecs and show the world what there is in them. The Booker, the South Noonday, the University and the Queen Bee, each pressing forward the work of devslopmsnt with all the speed tbat men and moncy can accomplish, will add their quota to swelling the fame of the south end Bodie mines and assist in estahlishing their great valns and psrmsnency.

Recent Decisions Relating to Patents, etc.

We give below brief abstracts of decisions* rendered upon patent cases in litigation, for the benefit of our readers:

DECISIONS OF THE U. S. COURTS.

Baker vs. Selden.

Supreme Court of the U. S.—Decided October term, 1879. Appeal from the Circuit Court of the U. S. for tbe Southern District of Ohio. Mr. Justice Bradley delivered the opinion of the court:

1. The copyright of a hook, if not pirated from other works, will be valid without regard to tbe novelty of the subject matter.

2. The description of an art in a book entitled to the benefit of a copyright lays no foundation for an exclusive claim to the art itself. The description alone can be protected by copyright. The art can only be secured, if secured at all, by letters patent.

3. A work on the subject of book-keeping, explanatory either of old systems or of an entirely new system, considered as a book conveying information on the subject and containing detailed explanations of tbe art, is the subject of a copyright; but the use of tbe peculiar systems of book-keeping described cannot be protected thereby.

4. Blank account books with ruled lines and headings are not the subject of copyright, nor can the copyright of a work on book-keeping, with portions illustrated by such ruled lines and headings, secure the exclusive right to make, sell and use account books prepared upon the plan set forth in such book.

5. Although tbe proofs show that the defendant makes account books arranged on substantially the same system as that explained in the copyrigbted book of the plaintiff, it does not appear that be bas violated the copyright of the same regarded merely as an explanatory work, and, as the plaintiff is not entitled to an exclusive right in the system, the charge of infringement is not sustained.

The decree of the Circuit Court must be reversed, and the cause remanded, witb instructions to dismiss tbe complainant's bill.

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* More complete reports of the proceedings may be found on file in the office of the MINING AND SCIENTIFIC PRESS Patent Agency, 202 Sansome street, S. F.

GREAT excitement exists in and around Tubac owing to recent discoveries of many rich gold ledges. The rock is free and easily worked in the old Mexican arastras, of which there are many along the river. It is mostly flour gold, very fine particles in the rock, and arastras $40 to the ton. Some thirty or forty claims have already heen taken up, hy Mexicans mostly, who are taking great interest in mining. Mr. C. A. Shihell and Judge Jos. Neugass are interested here, and intend visiting Tubac in a few days. The gold mine of fahulous richness reported found on the west side of the Santa Ritas, some twenty or thirty years ago, may yet he discovered and duly located. If we rememher aright, the specimen was brought in hy Major Duffield, who was murdered at the Bronco mine.—*Tucson Record.*

DYNAMITE IN WET HOLES.—The disastrous exploeions of dynamite that frequently occnr when that suhstance is used in wet holes, are explained as follows: After pouring dynamite into water, the sand goee to the hottom, hut the nitro-glycerine floats on the surface, and if the temperatnre he only to a small degree increased, explodes.

DOWNS MINE.—The rich strike in this mine has set things hooming, claims and extensions are the order of the day. Rock that glistens with gold is on exhihition at the hanking house of L. McLaine. In some of the specimens a little rock is mingled with the gold.

The Engineer.

Ohio River Improvements—Movable Dam System.

The Ohio River Improvement Commission held an adjourned session in the city of Washington with a view to advance the interests of the improvement of the Ohio river. Some 20 members were in attendance. Col. Wm. E. Merrill, the United States Engineer Officer in charge of the improvement described the progress of the work. After careful study and earnest investigations of the movable-dam system of France, the Engineer department has recommended a trial of this system on the Ohio, and one year ago a movable dam was begun at Davis island, a few miles below Pittsburg. If this dam should prove suitable to the peculiar navigation that obtains on the Ohio, and is satisfactory to those who control the trade, it is proposed to apply the system as far down the river as it may be found to be suitable, probably as far as Cincinnati or Louisville.

The general features of this movable dam may be briefly given as those of a dam that is so manœuvred that when there is a good stage of water, say six feet, such that regular boats can run, and no auxiliary to navigation is required, the dam, or obstructions so called, can be lowered on to the bottom of the river, and submerged, so that all kinds of river-craft can pass over them; but when the river falls so much that boats can not run for want of sufficient depth of water, the adjustable dam is raised, and the well-known system of slack-water navigation then obtains, by means of the ordinary lift-lock built at one end of the dam. The lock of the Davis Island dam is 106 feet wide, and 600 long, and will take a whole tow of coal-barges without breaking it up to be passed through. When the river is up, the dam is down and the tows and other craft pass over the site of the dam, there being scarcely a perceptible break in the surface of the water. At such times the lock is to remain open, and the boats may pass through it, using it as a part of the river channel. Col. Merrill found these aids to navigation in use on nearly all the rivers of France, to the number of about 125 dams and locks, varying considerably in the detail of their operation and management, but all giving general satisfaction. Similar locks and dams are now being constructed on the Kanawha river in West Virginia, under the direction of Col. Wm. R. Craighill, of the United States Engineer Corps.

The Baltic and North Sea Ship Canal.—According to the plans prepared by Herr Dahlstrom, to whom a preliminary concession for the enterprise has been granted, the proposed ship canal from the Baltic to the North sea will be traced from the Bay of Kiel to Brunsbuttel, in the estuary of the Elbe. Its depth throughout is to be 20 feet 9 inches, its width at the surface of the water 160 feet, and at the bottom 64 feet; the banks consequently have a very gentle slope. Provision will, moreover, be made, by the adoption of a peculiar system of locks and reservoirs, for increasing the depth of the water to 25 or 26 feet whenever it may be desirable to do so, and this depth will allow of the passage through the canal of the heaviest German iron-clad afloat—the *König Wilhelm*, a vessel of 9,603 tons displacement, and the largest ship in the German navy, drawing only 26 feet. The canal can, it is calculated, be completed in six years, and will, it is estimated, cost $3,750,000, or about $2,250,000 less than the estimates made a few years ago of the cost of constructing a canal 31 feet deep and 22 feet wide at the surface of the water.

A French Ship Canal at Home.—Of the many ambitious engineering works of improvement which the French are now debating, perhaps the most notable is the project for connecting the Atlantic and Mediterranean by a ship canal from Bordeaux to Narbonne. This scheme, which was some time since made the subject of a special investigation by M. Lepinay, is now being very generally discussed, on the strength of his report to the Vice-President of the French Senate. It is urged in this document that the execution of this project is a work of national preservation, and one from which France would derive immense advantages, military, economical and commercial. The cost of construction is estimated at about 75,000,000 francs. With the Simplon tunnel, M. de Freycinet's magnificent system of railroads and canals, the Algerian sea, and the Saharan railway, to say nothing of the Channel tunnel, and the Lesseps project to pierce the American isthmus, the French will have enough to keep them busy for many years to come.

The Sahara Railroad.—Three points on the coast of the Mediterranean have been proposed for the commencement of the line of railroad across the desert of Sahara. Morocco, Algeria and Tunis have each special recommendations, but there is a perfect unanimity of opinion regarding the expediency of making the route, from whatever place it is to be started, strike Insalah, a town which commands the whole line of traffic between the north and Timbuctoo. It is situated on the verge of the desert at the southern boundary of the French possessions in Northern Africa, and it is healthy and well supplied with water. The inhabitants have advanced far beyond the nomadic stage of civilization, and they are desirous of more intimate communication with civilized society.

Useful Information.

How to use Cements.

Quite as much depends upon the manner in which a cement is used as upon the cement itself. The best cement that was ever compounded would prove entirely worthless if improperly applied. The following rules, says the *Druggists' Circular*, must be rigorously adhered to if success would be secured:

1. Bring the cement into intimate contact with the surfaces to be united. This is best done by heating the pieces to be joined in those cases where the cement is melted by heat, as in using resin, shellac, marine glue, etc. Where solutions are used, the cement must be well-rubbed into the surfaces, either with a soft brush (as in the case of porcelain or glass), or by rubbing the two surfaces together (as in making a glue joint between two pieces of wood.)

2. As little cement as possible should be allowed to remain between the united surfaces. To secure this the cement should be as liquid as possible (thoroughly melted if used with heat), and the surfaces should be pressed closely into contact by screws, weights, wedges or cords until the cement has hardened.

3. Plenty of time should be allowed for the cement to dry or harden, and this is particularly the case in *oil* cements, such as copal varnish, boiled oil, white lead, etc. When two surfaces, each half an inch across, are joined by means of a layer of white lead between them, six months may elapse before the cement in the middle of the joint has become hard. In such cases a few days or weeks are of no account; at the end of a month the joint will be weak and easily separated, while at the end of two or three years it may be so firm that the material will part anywhere else than at the joint. Hence, when the article is to be used immediately the only safe cements are those which are liquefied by heat, and which become hard when cold. A joint made with marine glue is firm an hour after it has been made. Next to cements that are liquefied by heat are those which consist of substances dissolved in water or alcohol. A glue joint sets firmly in 24 hours; a joint made with shellac varnish becomes dry in two or three days. Oil cements, which do not dry by evaporation, but harden by oxidation (boiled oil, white lead, red lead, etc.), are the slowest of all.

Are Cape Diamonds Real Gems?—A person in England having purchased a ring set with what purported to be a diamond, and having later discovered that the same stone was a "Cape diamond", entered suit at law to recover the money paid for the ring. Judgment was given for the plaintiff on the evidence of several diamond dealers, who testified that "Cape diamonds are not to be regarded as ordinary diamonds, and that they lack the essential qualities of the Brazilian stones, viz., luster, hardness and color." A writer in *Nature* calls attention to this singular verdict, and expresses the hope that, when the case comes up for retrial, the Judge will require some scientific evidence (such as specific gravity or chemical composition) about Cape diamonds.

To determine the number of gas burners for a room of given size there can be no very definite rule for lighting given. Much depends upon *form* of space to be lighted and *color* of surroundings, also of quality of the gas. In ordinary dwellings with white walls and fair quality of gas, a five-foot burner will light brilliantly a space of 1,000 cubic feet. In public buildings, one half of the above amount of light will be sufficient, or one burner to 2,000 feet of space, although it would be well to provide for more light, in case the walls and ceiling should be of somber decoration. Much, of course, depends upon the arrangement of the burners; if uniformly distributed a better general result is attained, and less burners required.

Lithographic Stones.—There is a very large demand for lithographic stone in the United States, and the supply has until recently been chiefly from Germany. Now, however, Canada will probably contribute a considerable share in this trade, for the quarries of Marmora yield a stone which is quite as suitable for lithographic purposes as that obtained from Germany. It has been tested by practical lithographers, who say that its closeness of grain and general adaptability for the purpose will enable it to be used by lithographers with complete success.

Rubber Goods Manufactories.—There are in the United States and Europe more than 150 manufactories of *India-rubber goods*. These employ from 10,000 to 15,000 operatives, and consume annually about 40,000,000 pounds of raw material. The bulk of the crude rubber, and the best quality, is brought from Brazil, though considerable quantities are obtained from Central America, Africa (especially Madagascar), India and the islands of Borneo and Sumatra.

Put to a New Use.—A model fireplace, with fender, fircirons, etc., complete, has just been presented to the Natal Society's Museum by Mr. J. C. Wilson. The model, a perfect work of art, is entirely made of bullets fired at the British troops by the Zulus at Ulundi, and was constructed by a 60th Rifleman, who was present at that battle.

How Slate Pencils are Made.—In making slate pencils broken slate is put into a mortar run by steam, and pounded into small particles. Then it goes into a mill and runs into a "bolting" machine, such as is used in flouring mills, where it is "bolted," the fine, almost impalpable, flour that results being taken to a mixing tub, where a small quantity of steatite flour, similarly manufactured, is added, together with other materials, the whole being made into a stiff dough. This dough is kneaded thoroughly by passing it several times between iron rollers, thence it is conveyed to a table, where it is made into "charges" or short cylinders, four or five inches thick, and containing eight or twelve pounds each. Four of these are placed in a strong iron chamber or "retort," with a changeable nozzle, so as to regulate the size of the pencil, and subjected to tremendous hydraulic pressure under which the composition is pushed through the nozzle in the shape of a long cord, and passes over a sloping table slit at right angles with the cords to give passage to a knife which cuts them into lengths. They are then laid on boards to dry, and after a few hours are removed to sheets of corrugated zinc, the corrugation serving to prevent the pencils from warping during the process of baking, to which they are next subjected in a kiln, into which superheated steam is introduced in pipes, the temperature being regulated according to the requirements of the article exposed to its influence. From the kiln the articles go to the finishing and packing room, where the ends are thrust for a second under rapidly revolving emery wheels, and withdrawn neatly and smoothly pointed. They are then packed in pasteboard boxes, each containing 100 pencils, and these boxes are in turn packed for shipment in wooden boxes, containing 100 each, or 10,000 pencils in a shipping box. Nearly all the work is done by boys, and the cost therefore is light.

The Effect of Salt on Vegetation.—Maple sugar made from the sap of a tree in Williamstown, Vt., at the roots of which the brine from the farmer's beef and pork barrels had been emptied last Autumn, was so salty as to be worthless.

Any fibrous material can be stuck to metal whether iron or other metal, by an amalgam composed of good glue dissolved in hot vinegar with one-third of its volume of white pine pitch, also hot. This composition, it is said, will give a sure and certain result.

There are to-day no less than 600,000 cars in the United States, running over 90,000 miles of iron rails, and additional roads yearly spreading in all directions.

Good Health.

The Nature of a Cough.

A cough is an instinctive spasmodic effort of the lungs to expel the air which they contain, through their "pipes," or their bronchial branches, for the purpose of carrying before it, and out through the mouth, anything which is in the lungs or air passages, and which ought not to be there. It is a law of the animal economy to relieve itself; not the least of all the wonderful adaptations which infinite wisdom and benevolence has ordained for our preservation. The eye begins to water and wash out with tears the particle of dust or sand which offends it. The stomach revolts instantaneously at the presence of poison, and rejects it. The tongue repels anything placed upon it, that is not adapted to the well being of the system. And if the lunge were less vigilant, accumulations would take place from time to time, and they would eventually fill with solid substances, air could not enter and we would die. Cough is excited by putting a straw or feather or other offending substance in the ear; thus, if a person is asleep, and an insect were crawling in, the cough would arouse him.

Cough is the common attendant of consumptive disease. Although it does not imply that because a man has a cough he must necessarily have consumption, yet no one can have consumption without a cough, sooner or later, with extremely rare exceptions.

This cough is an effort of nature to remove from the lungs that which ought not to be there, that which is causing mischief, just as vomiting is an effort of nature to remove from the stomach that which, if permitted to remain longer, would cause increasing mischief. Therefore, to take medicine to repress cough is to counteract nature, and if persevered in, will always hasten death. Hence opium, paregoric, laudanum, morphine, or any other anodyne known to men, when taken day after day will inevitably and under all circumstances make death the more certain in all forms of consumptive disease, unless there is a physician in attendance to counteract their mischievous effects. And as every intelligent druggist knows that of all the patent or secret medicines sold for coughs, colds and consumption, there is not a single one that does not contain an opiate or anodyne in some shape or form, so they all fight against nature, derange her machinery, lock up the glands of the system, disorder the secretories, and therefore must prepare the way for a more certain decline and death. It is, therefore, suicidal to use them.—*Hall's Jour. of Health.*

Yellow Fever.—The medicinal rule is that an elevation of 4,000 feet above the level of the sea confers immunity from yellow fever.

Animalculæ and Disease.—Dr. Declat, of Paris, in a recent medical work which has excited much attention and criticism, argues that all diseases are due to the development, in or on the body, of animalculæ that are microscopic or invesable to the naked eye—that is, parasites—bearing an absoluto resemblence to the ferments that disorganize organic matter. This theory as applied to certain diseases is founded he says, on direct observation; to others, on striking analogies, and on all the other medical doctrines that have remained unexplained, save by the parasitic theory. Parasitism, he asserts, explains contagion, miasmatic influence, the action of viruses etc.; the ferment germs, floating in the air or placed in contact, in certain conditions with our organism, are developed in it and alter its functions; epidemic diseases are due to the invasion of animalculæ wide spread in the atmosphere; endemic diseases, intermittent fevers, yellow fever, typhoid fever, etc., are to be traced to centers of putrid fermentation, from which they derive their living germs, the parasites, and which are the cause of these affections; and that the proof of sporadic maladies being of parasitic origin is that many animals and vegetables are generated and developed at certain determined periods and places.

The Effect of Coffee.—Dr. Richardson, the eminent English scientist, in respect to the popular notion that coffee is an unhealthy beverage, that it keeps up a constant irritation of the stomach, and brings on depression of spirits, etc., says there is a great deal of truth in the idea, as coffee cannot be taken in excess without producing dyspepsia and irritation, but moderately used it is an invigorating, healthful and wholesome drink, bringing a man's best energies into play. The quantity taken, however, must not be large, and should be good. Dr. Bock, of Leipsic, another celebrated scientist, says: "The nervousness and peevishness of our times are chiefly attributable to tea and coffee; the digestive organs of confirmed coffee drinkers are in a state of chronic derangement, which reacts on the brain, producing fretful and lachrymose moods. Fine ladies addicted to strong coffee have a characteristic temper, which I might describe as a mania for acting the persecuted saint. Cocoa and chocolate are neutral in their psychic effects, and are really the most harmless of our fashionable drinks."

Near-Sightedness and Far-Sightedness.—Presbyopia, or what is commonly known as far-sightedness, is found to supervene earlier with those who are constantly at work than with other individuals, and, as soon as it does, convex glasses should be at once resorted to, without which the muscles of accomodation would be fatigued to no purpose. At first they should be used for working in the evening, after the fatigue of the day; but a long-sighted person should only use spectacles for looking at near objects, not at far ones. Work requiring close application favors the development of myopia, or near-sightedness, precisely in proportion as the conditions of illumination are bad, and, if the action of those causes continues the myopia must increase until vision is lost. If the eyes are fatigued by bad artificial illumination, blue or slightly smoked or smoke-colored glasses are useful, and in order to avoid the lateral rays, they should be large and round. In case of persistent irritation, all work should be abandoned, and an examination made to see if there be any disturbance of refraction, etc.

The Faculty of Attention.—In an article on "Mental Reflexes," in the London *Lancet*, Dr. J. Mortimer Granville says: "A frequent cause of failure in the faculty of the attention is striving to think of more than one thing at a time. It is, of course, impossible that the mind should be engaged with two topics at once. The expertness which seems to accomplish this feat is, in fact, a highly developed power of glancing from one subject to another with great rapidity—a sort of mental trapeze-flying, wherein the performer often gets an ugly fall, and may be permanently disabled. If he escapes this calamity there will probably come a time when he will discover that he has so impaired the power of application that he can scarcely follow a long sentence, or carry out a sustained process of reasoning. Those who are compelled by their daily avocations to practice this flying method of thought should for their own sakes, make it a rule to read, if possible, aloud—in any case attentively—a chapter or two of some sufficiently engrossing work at short intervals so as to cultivate the faculty of attention.

Diarrhœa in Hot Countries.—Dr. Talmy prescribes for the diarrhœa of hot countries from 20 to 300 grains of sugar of milk, daily. He administers it in the simplest way—the sugar, dissolved in a little water, as a draft in the course of the day. An excellent mode of administration consists in putting the dose of sugar of milk to be taken in a smaller or larger quantity of milk, according to the habits and digestive organs of the patient. The treatment is spread over several months, diminishing the dose as nutrition becomes more considerable and easier.

The doctors are after the electric light. They say it will eventually destroy the eyesight, and one medical man says he was blind for three days, the result of attending a concert in San Francisco in a hall supplied with the electric light. Edison has given us this eye destroyer, now let him give us invulnerable eyes.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, May 22, 1880.

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The Week.

The weather throughout the State has been warm and pleasant during the past week. In the mountain counties the vast accumulation of snow stored up during the winter, and augmented by the frequent and cold storms of March and April, will be melted by the warm sun and keep up the water supply in the streams for the use of miners. The loss of time occasioned by the extreme cold in the early part of the winter will be more than compensated for by the unusually large supply of water which will be available for mining purposes to a much later date than common. The River and Harbor Appropriation bill, which contains a number of appropriations for improvements on the Pacific coast, has passed the House of Representatives by a large majority.

A feature to which attention is called this week, in another column, is the beginning of the "sworn statement" system imposed upon mining superintendents by the Felton bill, which was passed during the recent session of the Legislature. This is the first time these statements have been made, and they take the place of the usual weekly letters.

Our mining exchanges continue to teem with accounts of strikes, purchases, bonds, discoveries, new districts, etc. The mining "boom" is in full blast all over the country. Scarcely a day passes but some important sale is made in the prominent camps. Prospectors are ranging over the mountains in all directions, and now that spring has opened, we may expect to hear of more wonderful discoveries from day to day.

THE Cassiar miners are beginning to start for that place. A steamer went up there last week, but could not proceed the entire distance.

THE House of Representatives has adopted a resolution to adjourn on the 31st of May.

Further About a Questionable Process.

Elsewhere in this issue of the PRESS will be found an article on the so-called Robinson process, prepared by Col. I. M. Taylor, a well-known mining expert of this city, and published in the New York *American Exchange*, from which we take it. This pretended process, though not lately introduced in the East, is not unfamiliar to the mining public of California, where its appearance was, with some blare of newspaper trumpets, announced and a great success claimed for it something over a year ago. Since then it has run its career and arrived at the goal invariably reached by similar pretentious devices on this coast, where the standing want of some more cheap and effective method of treating our debased ores exposes the mining community to be imposed upon by charlatans of this kind. Much was claimed for this Robinson process at the time of its first appearance in California, among other things that it was new, cheap, effective and capable of doing its work on large equally as well as on small lots of ore, all of which, it is needless to say, has been contradicted by subsequent experience. Credulous and tolerant, there were found here those ready to advance the necessary funds to give the thing a thorough trial. Small works were first erected, followed soon after by a larger establishment at Sacramento. A little later others were put up, first at Oakland, then at Grass Valley, and finally at Meadow Lake, at several points in Tuolumne and Amador counties, one over at Reno in the State of Nevada, and another even as far east as Idaho Springs in Colorado, experiments having been made at more than a dozen different localities with this simulated process before the summer was over. If it is in use at any of these places to-day we are ignorant of the fact.

The first party to look into this process and condemn it in a public way, was Col. Taylor, who about one year ago, after a careful examination of it, pointed out its utter worthlessness in a long communication on the subject, published in this journal at the time. This expose, coupled with the failures that afterwards attended every trial of the humbug, soon brought the thing to grief and, having entered it in the graveyard here kept for the reception of this class of remains, we consoled ourselves with the hope that we had heard the last of this empiric and his processes.

But in this reasonable expectation we are disappointed. The cadaver has, it appears, been resurrected, and is working further mischief in the East, where a company has been incorporated and is everywhere selling rights to use it. Finding it so resuscitated and at work, Col. Taylor, during a recent sojourn in New York, felt called upon to once more expose its want of merit, and caution the public against being taken in by it: hence this letter to the *Exchange* which we copy, believing all efforts at defeating the purposes of this new company to be in the line of journalistic duty and legitimate mining.

The fallacies of the Robinson process have been so fully and ably pointed out in the article referred to as to render further discussion of them superfluous. We therefore dismiss the subject, simply remarking that any application of heat, sufficient to drive off a portion of the sulphur, arsenic or other volatile element refractory ores may contain renders them correspondingly more docile and easy of further treatment. By raising sulphurets to a red heat, and while in this state precipitating them into water, a portion of their sulphur uniting with the water forms hydro-sulphuric acid. By some metallurgists it is claimed that through this treatment the ores are relieved of a greater amount of sulphur than they would be by allowing them to cool in air, and that through its employment a considerable saving in fuel and manipulation can be effected. Others, however, maintain that no such gains are effected, or, if any, that the difference is immaterial. Be this as it may, all are agreed that neither plan is wholly effectual, and that the only practical and thorough way of desulphurizing ores is by a continued roasting. This plan of heating ore and throwing it while hot into water was practiced by Mexicans in early days and is still more or less in vogue among them, its object being not so much to effect chemical changes as to render the gangue more friable and easily pulverized. It is a fact as old as mining itself and a good deal older than scientific mining, having been practiced in the most primitive stages of the business. It is the first thing that suggested itself to the barbaric mind when commencing to wrestle with the problem of ore reduction—it belongs to the age of the stone ax and hammer—it is the *process of the savage*.

COPPER IN LIVERPOOL.—Latest quotations for copper in Liverpool, according to James Lewis & Sons report, are as follows: Bars, good ordinary brands, £60 5s to £60 10s; special brands, £60 10s to £60 15s; ore, 12s to 13s per unit; regulus, 13s to 13s 3d per unit. The market has had a downward tendency. Stocks of West Coast produce on May 1st were 33,036 tons fine, against 33,000 tons on 1st ult.

The State Board of Equalization have assessed the total value of the Southern Pacific railroad within this State at $10,483,518. This valuation is divided pro rata among counties through which the line passes, according to the mileage in each county, the rate per mile being $14,733.

Arizona.—No. 4.

Geography.

The area of Arizona is given at 113,915 square miles, or a little larger than the whole of the British Isles, and nearly equal to the whole of the New England States plus New York. From its northern boundary, 37° north latitude, to its southern, its length is about 394 miles, while its greatest width, from nearly 109° to about 114° 50′ west longitude, is above 370 miles. Without sea-coast, with only one navigable river, the Colorado, and destitute of prairies, or of far-stretching forests of good timber, Arizona would be of little importance were it not for the minerals hidden in its mountain masses, especially along the central axis of the Territory.

But the development of the mineral wealth gives value to every spot that can be cultivated, and invites to the employment of irrigation for the reclamation of broad areas that need water only to render them fertile.

The most natural subdivision of Arizona is into a northeastern and northern region of plateau several thousand feet above the sea; a central broad mountain belt formed of short confused ranges, the interlacing of the Rocky mountains, Sierras and Mexican Cordilleras, whose peaks do not, as a rule, attain elevations equal to those found north and south of the Territory, and a southwestern region of comparatively low-lying arid plains, from which short mountain ranges rise suddenly, without intervening foothills.

Parallel with the Colorado for some distance south of its southerly bend lie the Black mountains, and nearly parallel with these, to the east, run the Cerbat range, continued southward by the Hualapai and the Music, Cottonwood and the Aquarices ranges.

Between the Cerbat range on the west, and the Music and Cottonwood ranges lies the broad Hualapai valley; and between the Black mountains and the Cerbat range is the Sacramento valley.

West of the Hualapais, and running east and west across the Colorado, which cuts through it at Mohave canyon, is the Mohave range.

In the district occupied by the previously mentioned mountains and their intervening valleys lie the San Francisco, Hualapai, Maynard, Cedar Valley and Greenwood mining districts.

East of these ranges lie the Mount Hope, Juniper and Santa Maria mountains, on which few mines are yet developed.

South of Prescott, and around the headwaters of Hassayampa and Agua Fria creeks, lies a wilderness of short ranges, around and among which are located some of the most flourishing mining districts of Arizona.

Chief among these are the Bradshaw mountains, trending southwest and northeast, with the Weaver mountains parallel to them, and the Date Creek mountains at right angles with them.

The Black hills and Verde mountains, west of the Rio Verde, the Mazatzal mountains between the latter and Tonto creek, and the Sierra Ancha, between the latter and Cherry creek, have not yet been entered to any considerable extent by miners, but it is thought that ultimately the Tonto basin will be found to contain some of Arizona's greatest riches.

South of Salt river, the Salt river and Apache mountains have a general east and west direction, while the Superstition mountains, inclining to the south, overlook the southwestern plains. In this region lie the Globe, Pioneer, Mineral, Summit, Pinal and Randolf mining districts.

To the northeast of the mountains of the Salt River district, and between the sources of the latter and those of the Little Colorado, lie the White mountains, the loftiest peak of which, Mt. Thomas, is 11,496 feet high.

Continuing the line of these mountains in a northwest direction, and rising high above the level of the plateau, which itself is some 5,000 feet above sea level, are the Mogollon mountains.

Northwest again of these, at the headwaters of Cataract creek, and surrounded by the great Colorado plateau, the short range of the San Francisco mountains rises into several lofty peaks, the highest of which, Humphreys peak, attains 12,501 feet above the sea.

East of the Salt River mining district, south of the White mountains, and north of the Gila, lie the Gila range and the Sierra de la Petahaya, enclosing between themselves and the White mountains the Prieto plateau and Prieto Park, while south of the Gila, and running usually in a southeast and northwest direction, are successively, commencing on the east, the Peloncillo, Pinaleno and Chiricahua, Galiuro and Santa Caterina ranges; and northward of the last, between it and the Gila, the Tortilla and Tortillita mountains overlooking the plains of southwestern Arizona.

Between the Peloncillos and the Pinalenosis is San Simon valley, and between the Peloncillo range and the Galiuro mountains is Grass valley, watered by Arivaypa creek, a branch of the Rio Pedro, which it joins by a canyon through the Galiuros.

The mineral riches of all these ranges, occupying the larger portion of southeastern Arizona, have only recently excited attention. Before reaching the valley between the Galiuros and the Santa Catarinas, the San Pedro passes between the Mule Pass and Dragoon mountains on the west, and the Huachuca and Whetstone mountains on the east; through a region now known to be one of the richest in the precious metals that rich Arizona can show.

Here, between the Dragoons and the Rio Pedro, is the now famous Tombstone district, already one of the chief centers of population, and southwest of it the Huachuca district.

South of Tucson and west of the Huachucas, in the district watered by the Santa Cruz and its tributaries, are the Mustang, Santa Rita, Patagonia, Atascoso, Cayetano and other short ranges. Among these are situated the oldest mines in Arizona—mines known and worked long before the Anglo-Saxon trod upon the soil, and even now among the most productive in the Territory. Here are the Tyndall, Aztec, Patagonia, Arivaca and Oro Blanco districts, with several small towns and a constantly increasing population.

The Colorado and its Great Canyons.

The principal and only navigable river, the Colorado, runs almost due west for some distance after its entrance into the Territory, crossing its northwestern angle, and cutting off the Kaibab, Sanup, Kanab and Sheavwitz plateaus, and the Antelops plains from the west of Arizona. For the greater portion of this distance the river flows in the depths of a canyon, the most remarkable, longest and deepest in the world. The principal portion of this is known as the Grand canyon, and above it are the Marbles and other canyons.

Near the confluence of the Grand Wash from the north the Colorado becomes the boundary between this Territory and Nevada, and, after passing through Iceberg and Boulder canyons, turns abruptly southward, and flows in this direction to the gulf of California, forming the western boundary of Arizona.

The wonders of this vast system of canyons, draining the land of all moisture, extending laterally for long distances along tributary streams and cutting up the entire country into a series of plateaus separated by deep water-worn excavations, the walls of which are from 3,000 to 6,000 feet in height, have been set forth in glowing terms by Lieut. Ives who explored its lower portion, and more recently by Major Powell, whose thrilling account of his descent of the river from the commencement of the canyon system to its termination will be fresh in the memory of our readers.

Below Boulder canyon is Black canyon, below which, except in the Mohave and Cane-brake canyons, the river flows mainly in a comparatively wide valley.

From the end of Black canyon to Fort Yuma the distance, in a straight line, is about 220 miles; and from Fort Yuma to Point Isabel, at the head of the gulf of California, is about 120 miles, of which about 60 are tide water.

The valley of the lower Colorado is exceedingly fertile, and naturally grows an abundance of mesquit, cottonwood and willow. Much of it is over-flowed by summer rains and freshets, so that it lies under somewhat similar conditions to the valley of the Nile, the narrow river bottom of which even now supports a population equal to that of the whole Pacific slope. It is said that on this bottom corn, beans and barley have matured and been gathered, in from 80 to 90 days. The Colorado in its lower course is exceedingly changeable, so that land that is at one time in California may be shifted into Arizona by the fickle river.

Bullion Shipments.*

Since our last issue, we have noticed the following bullion shipments:

Hillside, May 12th, $550; Ivanpah, May 12th, $6,011; Northern Belle, May 10th, $6,286.08; Bulwer Con., May 10th, $9,698.54; Standard Con., May 10th, $47,080.93; Northern Belle, May 12th, $6,432.54; Hillside, May 17th, $3,000; Christy M. Co., May 17th, $5,939; Grand Prize, May 7th, $23,338; Paradise Valley, May 7th, $3,182; on 17th, $4,446; Bullion, May 17th, $911.24; Wells Fargo, May 7th, $27,000; Contention, May 8th, $4,860; 11th, $7,116.69; 13th, $4,129.51; Tombstone, May 8th, $4,860; 11th, $12,161.32; 13th, $3,326.12; Richmond, May 10th, $17,977.41.

*Desiring to make our list of Bullion Shipments as complete as possible, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

THE MARYSVILLE FOUNDRY.—The Marysville foundry, which has in times past done a great deal of quartz mill work which has been very satisfactory in its character, is about extending its facilities for mining machinery and other work. Mr. H. J. Booth has, we understand, gone up to Marysville, and will hereafter, with Mr. Eckhart, give closer personal attention to the foundry. Considerable mining machinery has been sent south from the foundry of late. They are now building a 10-stamp mill with 20-horse power engine and boiler, for the Real del Castille M. Co. in southern California. This is a silver mill and will have a complete outfit of pans, settlers, etc. They are also building a fine 10-stamp mill for the Brown's Valley mine of Frank & Rule. A 20-stamp mill will soon be built for the Banner mine, above Oroville, formerly the old Smith & Parks mine.

THE daily receipts of the Government for the present month, had averaged more than $1,000,000.

The New Departure in Pan Amalgamation.

[Written for the MINING AND SCIENTIFIC PRESS by C. H. AARON.]

It is now a good number of years since I stated, as the result of experiments made in Mexico, that, in working roasted silver ore in pans, no advantage was gained by grinding, provided of course that the ore was not sintered in the roasting. On the contrary, the only effect seemed to be that my bullion was baser. This opinion was confirmed by other observers.

Within the last few years the practice has been gaining ground of amalgamating also unroasted silver ore without grinding in the pans. The ore is crushed to the required fineness in the battery, then worked in the pans with the mullers raised.

The rationale of the matter is probably this: In roasted ore nearly all the silver is in the form of chloride, and, as such, is soluble in the warm pulp, which always contains salt and base metal chlorides more or less. In this condition it is readily metallized by contact with an iron surface, or even by a surface of quicksilver and amalgam adhering to iron.

When the pan is worked with the muller grinding, the surfaces of shoes and dies are kept bright, no amalgam can adhere to them; a large portion of the silver chloride is metallized by them *out of contact with quicksilver*, and the silver thus reduced, in a condition of infinitesimal fineness, becomes mixed with the mud, and is thereafter hard to catch. Also, the base metal salts in the ore, some of which, as for example lead sulphate, being hardly soluble in the pulp, would be very slowly reduced to metal by an amalgamated iron surface with little friction, are rapidly metallized by contact with clean iron aided by heavy friction, and thus produce base amalgam.

Quicksilver has itself the power to slowly metallize silver chloride by abstracting its chlorine, itself becoming converted into calomel, but it has no power to metallize base chlorides. A clean iron surface metallizes both silver chloride and base chlorides with great rapidity, and although silver being more negative to iron than copper or lead, would be reduced from the state of chloride first, or at least fastest, when present in considerable quantity, yet, when the base metal salts are in great excess, the result is that both are reduced together.

Silver chloride has the power of redissolving copper or lead which has been reduced by the iron surface, because copper and lead are more "positive" to chlorine than silver is, but in presence of the still more positive iron the base metals are reduced too fast to be so redissolved, especially as the quantity of silver chloride in the pulp is continually becoming less as the operation proceeds.

If the amalgam which is forming in a grinding pan be examined at an early stage of the work it will be found quite crisp, indicating great purity, proving that the silver chloride, while tolerably abundant in the pulp, is reduced fastest; but to stop at this stage would leave too much of it undecomposed, and the amalgam will be found to become more and more base as the work goes on.

The particles of iron removed from the grinding surfaces by abrasion also contribute to the rapid reduction of the chlorides, and though they, as well as the copper and lead produced by them, do in part effect the metallization of silver chloride, yet the silver so produced, like that from the clean shoes and dies, is liable, more or less, to escape amalgamation.

In contact with iron, the reducing power of quicksilver is increased by galvanic action, so that it not only metallizes silver chloride more rapidly and without making calomel, but becomes also capable of reducing the base chlorides, yet not so rapidly as does iron itself. When, therefore, in working roasted ore, the muller is kept raised, and the surfaces of shoes and dies, instead of being brightened by scouring, become covered with a coating of quicksilver, which adheres in consequence of a film of silver, copper, or lead which forms upon the iron, the silver chloride, dissolving in the warm, salt pulp, is metallized as fast, or nearly so, as by direct contact with iron, there are no particles of iron floating in the pulp, and the silver, being reduced *in contact with quicksilver*, is amalgamated in the same instant, while the base metals are reduced more slowly than when grinding. It is a well-known fact that finer bullion is got in barrels with scrap iron than in grinding pans.

I will remark in passing, as a good deal has been said of late about refining base amalgam, that it may be done very simply by working it in a barrel with some roasted silver ore, when the base metal will be extracted from the amalgam at the same time that a portion of silver is extracted from the ore. When the amalgam is fine enough it must be removed, or calomel will be formed. The working of the pulp from the barrel can then be finished in a pan.

In working unroasted ores in pans without grinding, there is another circumstance which contributes to the result, which is that bluestone and salt are commonly used, making copper chloride by double decomposition, which acts by converting the silver in the ore into chloride, that is, chloridizes by boiling, so to speak, instead of roasting. This being the object and effect of bluestone and salt, or copper chloride, it is desirable, in order to get as much benefit as possible from it, to prevent as long as possible its decomposition by the iron pan, and this result is best attained by the avoidance of grinding, for the reasons set forth in speaking of roasted ors.

The best practice then in working raw ore in pans by the aid of chemicals, is to crush very fine in the battery, and work afterward in the pan with the muller raised sufficiently to avoid rubbing, while still low enough to insure contact of all the pulp with quicksilver.

In the case of gold being also present, and not yielding well, I will suggest as an experiment worth trying, that the ore be worked first for silver in the manner described, and then by grinding in the same or another pan, with addition of soda or lime, and perhaps potassium cyanide, for gold. The alkali will prevent the copper and lead from amalgamating, but is not believed to be injurious to the gold.

Note.—Perhaps I lay too much stress on the reduction of the silver in contact with quicksilver. I worked, many years ago, the first charge of roasted silver ore that was ever worked in a Beaux and Guiot pan, the construction of which was such that the quicksilver was not mixed with the pulp, nor distributed over the bottom, but was confined to a groove surrounding the grinding surface. The result was excellent. Also I know of cases in which the roasted ore was ground in one pan and amalgamated in another with good results; but the same experiment with raw ore was a failure, though it must be admitted that the pan used for the amalgamation was a very poor one for the purpose under the circumstances, being a Knox or Wakelee of the old style. Still, I think the point is of some importance, especially when much clay or slime is present.

Another Mining "Dredger."

We see by the *Mountain Messenger*, of Sierra county, that some gentlemen propose to put another mining boat on Feather river. They say they have hundreds of thousands to invest in it. So many attempts have been made to realize fortunes from the sands in the bottom of the rivers of this State, by means of pumps, vacuum engines, and similar devices, all of which have failed, that we thought for the present there would be no more attempts in that line. It seems not, however. We do not know any thing about the details of the new "mining boat," or the means by which the golden sands are to be sifted and washed, but on general principles we have doubts about any scheme of that nature succeeding.

Sands and tailings which have been once washed and deposited in the beds of rivers, if again handled, must be taken in such immense quantities, that any process dependent upon machinery for lifting them from their beds, will, in all probability fail. If they are in such a position that they can be directed by water and flumes, etc., where they can be washed, it is all very well. But lifting them ton by ton and working them over, will scarcely pay unless they are very rich.

Even before any attempts of this kind were made in our rivers, similar schemes were carried out on the ocean beaches of the Gold Bluffs. Mining pumps and dredging appliances of different kinds all proved failures. While sand on the beach itself paid, that which was supposed to be concentrated, outside the surf, would not pay.

In the river claims, where dredging and pumping boats have been employed, failure after failure has occurred. Some little gold has been taken out, but it usually cost from $5 to $10 to take out one dollar. This experience has happened to so many that it would seem as if strangers would inquire into the reasons very carefully before undertaking similar enterprises. The failure is always laid to the machinery. Of course it is the machinery; but any kind of machinery for lifting and handling the debris, or the sands, will cause such an expense in proportion to the amount yielded by the sands, as to render the enterprise a failure. Simplifying the machinery will be of very little avail in the general result. However, each new experimenter will serve as a warning post to the next man, and the more prominent the failure the better chance there is of others being deterred from following in the same footsteps.

The Newcastle Mine.

With the revival of mining in the last few months, the lower foothills are receiving considerable attention, and a number of valuable properties are being developed. In early days, in these lower hills and ravines were some of the richest placer diggings in the State, but their large banks of deep gravels have been but little worked, except by drifting on the bedrock, hydraulicing being in the main impracticable, owing to lack of head for the water and dump for the tailings. The surface placers were long since worked out, and the comparatively little mining of recent years, principally rewashing of tailings, has been done almost entirely by Chinamen. In some instances, where a sufficient head of water is obtainable, Cranston's hydraulic machine is employed very successfully.

A few months since capitalists purchased what is known as the Yankee Hill claim, located about two miles from Pino, in Placer county, and incorporating as the Newcastle mining company, commenced active operations at once. Their ground consists of 120 acres, 90 acres of which are covered with gravel from 30 to 100 feet deep, the whole averaging about 60 feet. The bedrock is granite, the surface of which is very much decomposed and eroded. The gravel is easily piped and washed, no pipe clay and but little cement being present. The latter is principally decomposed granite sand and is easily broken up. The gold is fine, but is found distributed through the entire mass of the gravel, and careful prospecting seems to indicate the average richness of the latter, where piping is at present going on, to be from 30 to 40 cents to the cubic yard. The water is taken from the Bear River ditch, three miles distant, and conducted to the sand box. From thence, two miles of 22-inch pipes, with a maximum capacity of 1,200 inches, bring it to the mine under a head of 120 feet. One No. 2 giant, throwing 260 inches, is used at present for piping, but the distributer is arranged for three giants, which can be put on when desired. Four hundred feet of 2½-foot sluice-boxes and one undercurrent constructed in the most thorough and substantial manner, discharge the tailings into Kidd's ravine, in which they are dammed and backed up for several hundred yards, to be subsequently rewashed after slacking for a year or two. The mine has been opened and fitted up under the supervision of Mr. Charles E. Allen, the president and superintendent of the company.

VIEW ON THE KERN RIVER.—(A. Bierstadt.)

A California Scene.

We give on this page an excellent reproduction of a choice painting, representing a fraction of the grand and beautiful as embodied in California natural scenery. The view combines the majesty of the mountains with the quiet beauty of the riverside; its quiet disturbed only by the wild life natural to our unfrequented districts. The view is on Kern river, one of the most notable of the Southern California streams. In an article recently published, the *Pacific Press* gives a characteristic sketch of the river and its course:

Kern river, or *Rio Bravo* as formerly called by the Mexicans, is a topographical exemplification of the course of but too many of earth's high horn sons. In its early stages we find it a lovely little stream, rising in the region of Mt. Brewer and coursing south among some of the grandest scenery of the Sierras, passing on its way Mt. Williamson, Mt. Tyndall, Mt. Whitney and Mt. Agassiz, whose snow-capped peaks rise between 14,000 and 15,000 feet into the bluest of western skies, and whose waters pay tribute to the clear water of *Rio Bravo*. It is here among these grand old giants that Mr. A. Bierstadt, our celebrated national painter, has selected the subject of one of his works of art, the which our engraver has so well succeeded in copying. Here where we see the grand and sublime united with the mild and lovely we have indeed a combination well worthy the brush of the painter, or the pen of the poet.

Following its course still further down we find it leaving the mountains and entering among the rolling hills from whence it emerges into the heated and alkaline valley of the San Joaquin. For many miles it carries with it along its shores traces of its former loveliness, but gradually its waters become dark and muddy; it forms sloughs and miasmatic marshes, and its waters degenerate from pure and life-giving to fever and death-bearing.

It opens up, it is true, a large agricultural district, and much land that would otherwise be barren waste is made to produce abundantly by means of irrigation; hence many are induced to settle in this region where they may utilize its waters, but we think many who do so have reason sooner or later to regret their choice of location, more particularly, however, on account of its unhealthfulness, than for other reasons. The greater part of its waters finally empty into Goose lake, though much of it sinks in sloughs and a part finds its way into Kern lake. The region in which it rises is remarkable for its loveliness, but step by step it descends in its course of dissipation until it ignominiously comes to its end in Goose lake.

Indians and the Miners.

The mining "boom" is bad for the Indians. The white men are bound to invade the reservations, if within the boundaries there is the least chance for finding gold or silver. This has been the case heretofore, and will be again. The Gunnison country, where the excitement is expected this summer, is on Indian ground, but this has not deterred the prospectors from going in. The results so far have been, however, disastrous. The Chicago *Times* of the 15th publishes a story from Leadville, told by John Allendorf, to a reporter in that city, regarding the terrible massacre of white prospectors en route to the reservation. Allendorf says that he left his home in Linn county, Kansas, seven weeks ago, with 17 others, equipped for an expedition in search of mineral, which they found on the headwaters of Gunnison river, in rich placers, which yielded from $2,000 to $4,000 per day. On May 3d, while the party was widely scattered, Indians, mounted, and 500 strong, galloped down upon the camp and massacred the whole party, cutting their bodies into pieces. Allendorf witnessed the affair from a mountain, whither he had gone hunting. The Utes had carried off all the gold and the whole outfit. Allendorf escaped, and walked for several days, until he reached a settlement.

Telegrams received at Leadville report that men coming from the reservation to Lake City report a party of 25 prospectors corralled on the Gunnison, and 12 killed. This is supposed to be Bradbury's party, which left Del Norte three weeks ago.

Dispatches for Los Pinos Agency, Colorado, of the 18th, say: The reported massacre by the White River Utes of Bradbury's party of prospectors from Del Norte is disbelieved. Chief Ouray has no confirmation. Acting Agent Sherman, under orders from the Department, and at Ouray's request, followed the party nine miles up the North Fork of the Gunnison, to warn them off the reservation and of the danger they were incurring. He found it impossible to overtake them, as they were evidently making marches for Eagle river. Several days previous to his arrival at their abandoned camp, at the junction of the waters of Eagle and Gunnison rivers, a parley of some kind occurred, as the Indians report that Bradbury claimed them to be Mormons bound for Utah, though traveling in an opposite direction. Dr. McKenzie's scout (Gibson) is here, but does not report any forward movement of troops. The Gunnison country is swarming with prospectors.

Working Low-Grade Ores.

There is considerable talk here on the Comstock now of commencing the reduction of some of the millions of tons of low-grade ores which have been left in the vein at various levels nearer the surface than where explorations are now being made. Mining men say this can be done and a profit realized provided the expenses of mining and milling can be reduced a little. They do not propose to raise any opposition to the Miners' Union, as they know very well that no country can be truly prosperous unless the laboring classes are well paid for their services. The plan talked of is to allow the Miners' Union to continue the control of all men put into the upper workings, but that these men shall be allowed to labor where the mines are cool and above a certain level at a certain reduction from $4 per day. This would still leave the control of everything in the hands of the unions, because their own men would of course report at once any violation of the agreement looking toward a reduction of wages generally in the mines. This it is thought will entirely do away with the "entering wedge" argument, and show that the mining men of the Comstock have no disposition to reduce the wages of those who go into the heat of the mines and do the work in the lower levels.

Conversations have been held with many of the biggest mining men of the Comstock and all agree that the man who endures the heat and dangers of the lower levels and works there is fully entitled to his $4 per day, and that $4 is none too much. If, however, men could under these restrictions be allowed to work above in the manner prescribed and with no danger to the unions and to the general prosperity of the Comstock, a new industry would no doubt be inaugurated in the mining and milling of low-grade ores.

It might, however, be also necessary that wood and other supplies should be obtained at lower rates in order to make the industry remunerative. It does not seem to be a proposition that the workingmen of the Comstock should make all the sacrifices necessary to inaugurate this work. Wood can be had in abundance at Truckee for $3 per cord. It should be delivered to the mines for less than the $10 now paid. Let the railroad yield a little as well as the laborers and thus come in for a fair share of the credit of opening a new field of labor and promoting the general prosperity of this section.

If the foregoing plan of co-operation can be agreed upon there is but little doubt but that the work will be commenced. Then, if it costs $1,000 to take out $1,000 the country is a thousand dollars richer, for that amount will have been added to the gold and silver in existence and men will be given something to do, a consideration of some consequence as things now are among us.

Some have intimated that the miners' unions have been agitating this matter themselves, and are favorable to the plan, provided they can be satisfied that it does not cover an intention to reduce wages in the mines.—*Gold Hill News.*

Blind Mountain District.

This district has of late been attracting considerable attention among prospectors and during the past few months a great deal of work has been done upon the different claims. Some years ago Blind Mountain was well thought of on account of the rich ore that lay near the surface. A district was formed, claims located, and a large amount of ore, ranging all the way from $200 to $400 per ton, was shipped to Eureka at heavy expense, as it was base and could not be milled. Soon after the excitement died out, and with the exception of the yearly assessment work, the different mines lay dormant until some few months ago, when the Midnight was taken hold of, and after some work a large body of high grade ore was uncovered and shipped to Bristol, netting for its owners the sum of nearly $8,000 as the result of two months work. The main shaft of the Midnight mine is now down 131 feet and in the bottom a totally different character of ore has been encountered the past week, carrying a good deal of sulphurets and giving sample assays running up in the thousands. There is now twenty tons of ore on the dump ready for shipment which will net from $150 to $200 per ton.

In the Thorndyke, adjoining the Midnight, a depth of over 135 feet has been attained, and numerous drifts and cross-cuts have been run to strike the ledge. At present work is being done sinking on the new strike, about twenty-five feet south of the main shaft, which is looking exceedingly well. Shipments of ore will commence to Bristol upon the starting up of the Hillside furnace. Farther up the mountain is located the Bristol, an immense ledge traceable for miles, the property of Messrs. Howell and Sheridan, a contact of ore from eight to twelve feet in width, laying between slate and lime. A shaft fifty-six feet was sunk off the ledge, with the expectation of catching it on the dip, but the ledge was found to have a break which necessitated a drift of about fifty feet to strike it. The drift is now being driven through hard slate and is in forty feet, with every appearance of mineral ahead. Operations will soon be resumed upon the Kenebec and other mines, and from present indications it will not be long before Blind Mountain will be enrolled as a paying district.—*Pioche Record.*

Eureka District.

The *Sentinel* desires to direct the attention of its Eastern readers to a few indisputable facts:

First—We assert that Eureka is the most extensive mining field in the world. Its mineral zone has a length of eight miles by from one to four in width. There is scarcely any part of this vast area that is not mineral bearing, in the sense that constitute a promising outlook for a paying mine.

Secondly—It may be stated, as conclusive proof of the great extent of our mineral bearing territory, that the records of the District Mining Recorder's office shows the location of *more than two thousand mining claims* in ten years. There are nearly two hundred mines in the district for which U. S. patents have been obtained.

Third—Two of our leading mines have paid dividends consecutively, for a greater length of time than any other two mines in America. They are still paying, and will continue to pay right along indefinitely.

Fourth—There are five hundred partially developed mines here that can be had for less money, according to prospective valne, than at any other point in the United States. A small sum as purchase money and a little more for development, guarantees the investor a paying property, and possibly a honanza with "millions in it," in a few months.

Fifth—The total hullion output of Eureka district aggregates over $60,000,000. Many of these millions were obtained from the partially developed properties we have been talking about.

Sixth—We have a good climate, pleasant surroundings, and rail connection with the outside world.

Seventh—If you want to embark in safe, legitimate and profitable mining, at small cost, Eureka is your place.

Tombstone District.

The leading mines of this place are more than coming up to all that was expected of them. The Charlestou mills send out their regular quota of silver bars, now averaging about $80-000 per month, and the Contention mill an equal amount; thus making $160,000 per month from the two mines—the Tough Nut and the Contention. At this rate it will aggregate about two millions per annum from the two mines with their mills, at present capacity. But these mills will he enlarged or other ones built, for the output of the Tough Nut will more than supply double all the stamps now dropping in the district, and shortly the Sunset, Grand Central, Empire, Prompter, Head Center, Randolph, Ajax and other mines will have mills, and as these mines produce an abundance of ore equally as rich as that now being milled, I cannot well see how the annual yield of hullion from Tombstone alone can fall as low as $10,000,000. In fact there is to he a "boom" here very soon that will out-boom everybody else's boom. Besides mills, we are soon to have more steam hoisting works than all the rest of Arizona combined. There are now seven of them here and more coming.—*Cor. Arizona Citizen.*

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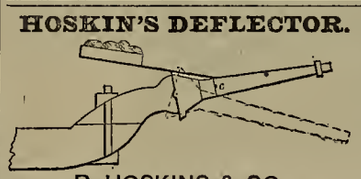

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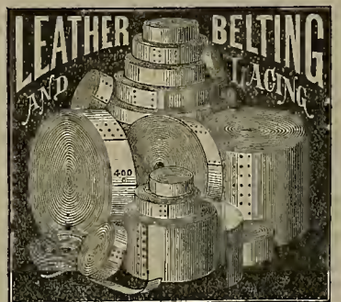

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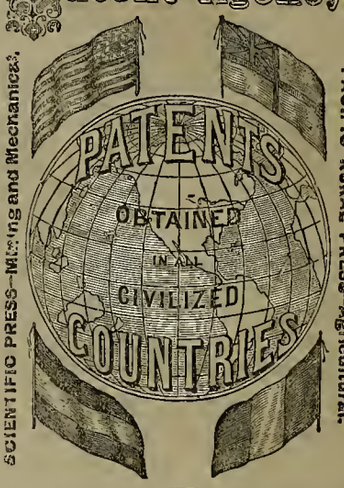

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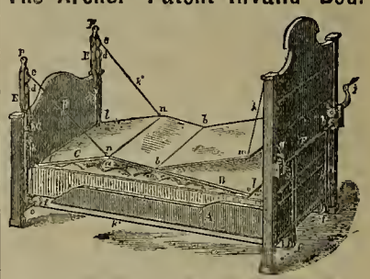

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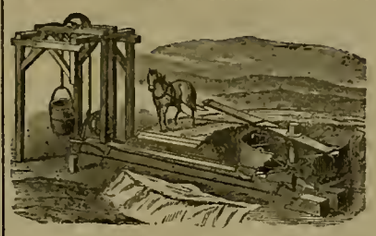

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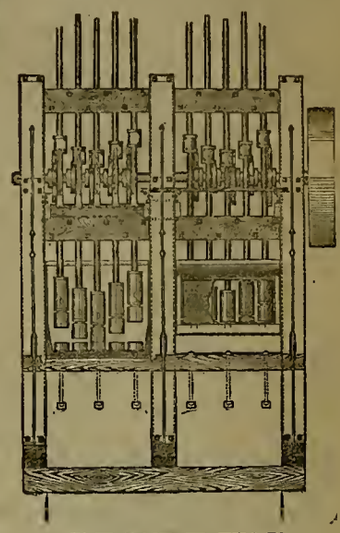
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



SPERRY'S
Wrought-Iron Frame
FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.
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We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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Rock Breaker and Cornish Rolls Combined.
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Furnaces for chloridizing and desulphurizing ores.
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OF IMMENSE PRACTICAL VALUE TO EVERY SAW USER.

GRIMSHAW on SAWS!

History, Development and Action; Classification and Comparison; Manufacture, Care and Use of SAWS of all kinds. Quarto. 234 Illustrations.

By ROBERT GRIMSHAW, Ph. D., M. E.,

Member of the Jury on Wood-working Machinery at Paris Exposition of 1878.

This thorough work, impartially written in a clear, simple and practical style, treats the Saw scientifically, analyzing its action and work, and describing, under the leading classes of Reciprocating and Continuous Acting Saws, the various kinds of large and small hand, sash, Mulay, jig, drag, circular, cylinder and band Saws, as now and formerly used for crosscutting, ripping, scroll-cutting, and all other sawing operations in wood, stone and metal, ice, ivory, etc., in this country and abroad. With appendices concerning the details of manufacture, setting, swaging, gumming, filing, etc., tables of gauges, log measurements from 10 to 24 feet, and from 12 to 96 inches, lists of all U. S. Patents on Saws from 1790 to 1880, and other valuable information. Elegantly printed on extra heavy paper, wide margin, copiously indexed
Owing to an increase of nearly 100% in number of pages and illustrations since first projected, the price is this date made $2.50, postage paid.

ROBERT GRIMSHAW,
624, 626 and 628 Market Street, Philadelphia.
March 10 1880.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING MAY 11TH, 1880.

227,405-6.—PLOWS—L. Begon, S. F.
227,482.—FRUIT DRIER—J. H. Burks, San Luis Obispo, Cal.
227,528.—PUMPING APPARATUS—W. V. Henry, Sacramento, Cal.
227,459.—STAIRWAY ELEVATOR—J. I. Tay, Oakland, Cal.
227,601.—EXPLOSIVE COMPOUND—R. W. Warren, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CENTRAL DRAFT FOR PLOWS.—Louis Begon, San Francisco. Patent No. 227,406. May 11, 1880: The object of this invention is to apply the power used for plowing direct to the center of resistance on the mold board, instead of decomposing said power, as is done at present, in order to resist the pressure of the earth upon the mold board. A plow may be conceived as being a compound and combination of two wedges, one advancing horizontally and raising the furrow slice, while the other, being placed laterally along the beam, throws or shifts said slice usually to the right of the plowman. As the plow advances it is struck by the earth, and a part of the effect of the same being to throw the plow sidewise toward the plowman. To obviate that side pressure the horses are usually hitched up at a point on the regulator, instead of at the end of the beam, and so their united strength is decomposed, and a part of it used to push the end of the beam sidewise to the left in order to balance the side pressure on the mold board; but for such an offset to take place there must be a fulcrum on the other side of the plow. The plow having to be pulled through these opposed pressures, requires more power than it would if the power could be applied more directly at a point on the center of resistance. In this invention an additional beam is employed, which is provided with a strong iron curved standard. Said standard is applied to the back side of mold board, and thus has just the same relative resistance as that of the handle of a common pick or rake.

SCREW PROPELLER.—John B. Ward, San Francisco. Patented April 13, 1880. No. 226,466. This device consists in the employment of a peculiarly formed elastic blade, which is united to the hub, upon which are formed flanges upon the arc of a circle, so as to give the greatest strength at this point. These blades are formed circular, but are with a straight line face, and of a substance of an elastic nature, the outer edge being in the arc of a circle, so as to increase the efficiency of the blade. This form gives the greatest area with the least circumference, and hence the greatest strength for a given surface or gripe. It further relates to certain details of construction in the matter of the point of junction of the blade and hub-flange.

STAIRWAY ELEVATOR.—John I. Tay, Oakland, Cal. Patented May 11, 1880. No. 227,459. This elevator consists in placing at one side of the staircase in convenient position, a small tramway upon which travels a light, peculiarly constructed car, so arranged and connected hy cords with weights, that a person stepping upon the car, may, hy turning handwheels, at little expenditure of power, propel the car up or down as the case may be. Suitable arrangements are made for properly counterbalancing the car; for drawing it either up or down empty to the position of the person desiring to use it; and for the application of a brake for the prevention of accidents.

PLOW.—Louis Bsgon, Sau Francisco. Patented May 11, 1880. No. 227,405. This invention consists in a novel construction of the mold-board of plows, whereby the furrow-slices are turned over and lay in the manner best adapted to the beet plowing. It relates to the geometrical design of the mold- board or plow proper, and not to the beams or handles.

AN outbreak of the San Carlos Indiane, in Arizona, is reported, but the story of the hostiles ou the war path and the fleeing settlers, has no foundation, and appeare to be an exaggeration of one of the incidents of the troubles in New Mexico, located in a place where the first etory had been told. The agent of the Sau Carlos reservation ie a very careful and conscientious officer, and fully understands the importance of kecping a strict watch over his warde. His arrangemeuts for kseping himself informed are perfect, and no considerable number could be away for half a day without the fact coming to his notice.

Our Future.

The coming census will afford data for the thoughtful and curious who wish to speculate on the future prospects and expectations in store for the people of this alrsady grsat country. Nations as well as individuals look to the future and its bright hopss for no small measure of the valus which ths prssent affords them. But as nations continue, whils individuals drop out, its ultimate destiny will ever remain a propsr nbject for speculation and inquiry. Future expectations are gsnerally hased upon past experiences as the safest if not the only guides. This nation's future lies with the coming ages, but we of the present are equally interested in viewing its prospects with hopeful minds. The aspirations of youth ars strengthened hy hright prospects ahead which it seems to realize in advance. No American citizen needs but to reflect on the greatness that is now in store for his country in order to be inspired with a desire to become in all respects worthy of his citizenship. The first great conflict which all new communities are of necessity compelled to eudure against the rude forces of nature is rapidly turning in our favor. The vast increase of material wealth, the generous opportunities afforded for mental attainment and moral growth, is evidence that our past history is a fair specimen of what our future is yst to he. Our rapid increase in wealth, territory and population is without parallel. Less than 50 years ago, statesmen—even our Webster—looked upon the acquisition of the Pacific slope as a matter of no consequence. But the event has fortunately shown that no time was to be lost, as modern science was soon to bring all parts of the world into almost immediate connection. As an integral part of this nation, California, with only a partial development, has risen to an enviable position among the sisterhood of Statcs.

Our boundless mineral wealth and agricultural resources, and rapidly increasing population, guided by that spirit of progress which results from a wise legislation, guiding and fostering legitimate business enterprises, and the invention of time and lahor-saving appliances, must in the natural course of things determine what the future of our Staie shall be. If our State authorities would wisely give their attentiou to the important matter of rceeiving a portion of the vast flood of immigration which is now coming to our shores, one great element of future prosperity would be attained.

The narrow policy which at present leaves thie matter in the hands of a few agricultural colonies, is the one groat misfortune under which we suffer. In this we should emulate the example set us by eome of our sister States, whose Boards of Immigration are actively engaged in accumulating and disseminating valuable information for settlers and capital seeking remunerative investment. These institutions, owing to some unaccountahle apathy or want of foresight, have no adequate representative in our State. There is promise of cessation of that uneasy hankering after a rapid accumulation of wealth, which leads to speculation and unsettles the mind from that even, healthy condition which is so essential to a steady, normal growth. The snicidal hahit of driving husiness along at break-neck speed, regardless of consequences, so as to get all we cau out of it, must be reformed with no sparing hand. Such a rcform would redound greatly to the advantage of this community, saving it from the leveling effects of the blind business manipulations and merciless reign of the salaried officials of villainous joint-stock organizations.

Many of the difficulties which surrounded this subject arose from the indefinite ideas which the public entertained in regard to the rights and duties of stock companies, but recent legislation is tending toward a removal of these difficulties, and to a clearer and more authoritative definition of these rights and duties.

THE Acting Agent of the San Carlos reservatiou writes as follows on May 19th: There has been no outbreak of reservation Indiane on San Pedro, to my knowledge. Eskiminzine and Saguilly have heen here since Thursday. There are seven Indians only absent from San Carlos, and they are at San Pedro and Arivaca with permission to cultivate lands, and I know of none absent with passes.

A *Times* Leadville special says: A company of 100 men will he organized here to-morrow to go into the reservation. Major Kline of the formerly celebrated Buck-tail (Pa.) Regiment, will lead the expedition. It is rumored that Indians were seen in Roaring Forks to-day.

A REPORT to the annual conference of the Mormons says that the Mormon population of Utah is 111,820, that the church in that Territory has lost 600 members and gained 1,500 in a year, and that the church receipts in that period were over $100,000.

AT Havana the desire for a commercial treaty between Cuha and the United States is daily becoming more pronounced. The President of the Board of Commerce has issued a circular advising merchants to use all the means at their disposal to promote the conclusion of a treaty.

ANTIMONY is selling in Liverpool at £71 to £74 per ton for French star regulus.

The Census and the Forests.

More evidencs is received which strengthens the belief hitherto expressed that the census of 1880 will be of great value to the collection and dissemination of information concerning our industrial resources and progress. We have just received a pamphlet-circular from Prof. C. S. Sargent, of Brookline, Mass., who is the special agent of the census to conduct the inquiry into the forest resources of the country. Prof. Sargent is Arnold Professor of Arboriculture in Harvard, and well qualified for the work hs has iu hand. He bas already visited this coast, in pursuit of forest studies, and proposes to come again this summer, when we hope every facility will be afforded him to examine thoroughly our timbered rcgions and ths influences affecting tbeir growth.

The circular issucd by Prof. Sargent is a pamphlet of 94 pages, sach alternate page being hlank, so that it will serve as a note-book for field notes or for othsr annotations. It is entitled "A Catalogue of the Forsst Trees of North America." It is, of coursa, intended only as a means of drawing out information which will make it more complete and correct. We would like to ses a copy in the hands of every student of tree-growth and distribution in the State, in order that all important facts may be secured and incorporated in the revised edition of the catalogue, which will then be a work valuable for all time. We believe that Prof. Sargent desires the co-operation of all who have given attention to this branch of economic botany, and we hope he will secure it. The revieed catalogue is to be joined to hie report on the forest wealth of the United States, now in course of preparation. This report is to have special reference to the geographical distribution of forest trees, with their economic properties and uses. Knowledge of this nature in regard to our trees is still so imperfect that it is impossible to make a catalogue at all exhaustive without the assistauce of local hotanists and others interested in trees and their products in every part of tho country. The catalogue has the common as well as the botanical nameu of the trees, and is therefore intclligible to those not versed in botanical nomeuclature.

The matters on which iuformation is specially desired arc as follows:

1. The extreme geographical range of any species.
2. The rcgion and elevation where any species is principally multiplied and reaches its greatest perfection.
3. The geological formation most favorable to the multiplication and development of any species
4. Dimensions of remarkably developed specimens of any species.
5. The common or local name of any species in addition to those already given.
6. The purposes, however unimportant, for which the wood of any species is employed.
7. Products of any species other than wood, such as tannin, charcoal, dyes, potash, edible fruit, forage, etc.

If the inquiry on these points is thorough and wide observation elicited, as we hope it may be, the result will be of incalculable advantage to the Pacific coast. Our timher resources, from California's coast and Sierra ranges, and northward even to the forests of Alaska, are of. wonderful extent and value, and it would be to the advantage of the whole coast to have them developed and utilized wisely. Already there are considerable exports of saw-mill products to the islands of the Pacific ocean and to the treeless regions of South America, hut the aggregate must be very small when compared with the trade which will ultimately be carried on in these directions. It is true that for the market at present found in this State there is little occasion to increase lumber products, but whsn one views the vast forest resources on our upper coast and remembers that older timber regione are being despoiled of their material very rapidly, it will appear only a question of time when our reserves will be called for and an immense and profitable lumbering business will he done. Such an industry will foster the progrese of the coast in many waye. It will call for more extensive manufactures of iron and eteel, and will both directly and indirectly furnish home markete for a great amount of agricultural produce. As, therefore, an agency looking toward the realization of snch results we are dispoeed to favor the proposed work of the census authoritiee with reference to our forest wealth, and we hope Prof. Sargent will secure such general coöperation among those well informed upon Pacific coast growths that the forthcoming report and catalogue will he as accurate and comprehensive as the best information can make them.

NEW MEXICAN MINES.—We glean from John Fillius, who returned from the Cerrillo mines about three weeks ago, that they are fissure veins in a limestone formation, and drifting, crosscutting, etc., are comparatively easy. The lodes carry low-grade galena averaging about 31 ounces of silver per ton, and carrying from 50% to 65% of lead. Assays range from 8 to 4,120 ounces silver per ton. Carhonate of lead is said to exist there, but it does not contain profitable quantities of silver. Mr. F. is enthusiastic over the facilities for stock raising, but there does not appear to be any special inducements for miners of this section to emigrate to the mines of Cerrillo.—*Colorado Miner.*

TELEGRAPHIC and mail communicatione have been resumed with Hanford, Tulare county.,

News in Brief.

THE slave trade on the Red sea has besn revived.

THE mortality in Paris is creating great alarm.

THE forest fires in New Jersey ars still hurning fiercely.

THE cost of the Afghan war is upward of $65,000,000.

INDIANS ars committing dspredations in western Texas.

THERE ars about 30,000 Chinamen in Peru and more wanted.

THE streets of Honolulu will be shortly lighted with gas.

RUSSIA contemplates sending several men-of-war to the Pacific ocean.

MORE than 100,000 immigrants have arrived at New York since January 1st.

GENERAL MARQUEZ has inaugurated another revolution iu northern Mexico.

SIR BARTLE FRERE bas resigned the Governship of the Cape of Good Hope.

WORK has been rssumed on the Canadian Pacific railroad at Yale, B. C.

A SUB-MARINE cable is to bs laid between ths Philippine islands and Singapore.

THE South Pacific Coast railroad commenced on the 15th to run through trains to Santa Cruz.

THE San Francisco School of Design opened Monday, May 17th, for the summer tsrm.

SEVERAL whits prospsctors were recently massacred on ths Ute reservation in Colorado.

AMONGST the Jews ordsred to leave St. Petersburg, Russia, there is a citizen of the United States.

THE President has nominated N. G. Ordway, of New Hampshire, to he Governor of Dakota.

BY the bursting of an old shell at Nanaimo, B. C., a few days ago, several persons were injured.

ALL of the Chimehnevas Indians in Arizona have surrendered and are now held as prisoners of war.

THE Zurnat tribesmen have fortified Attiuor Pass, Afghanistan, and are holding it with 9,000 men to repel the British.

WHEELER, the last of tho Mendocino outlaws, who was sentenced to be hanged July 2d, committed suicide in his cell Saturday with morphine.

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and scienec, by assisting Agents in their labors of canvassing, by lending their influeuce and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.
J. F. OSBORNE—San Francisco.
B. W. CROWELL—California.
A. C. KNOX—Pacific Coast.
G. W. MCGREW.—Santa Clara county.
CAPT. W. H. SEAMENS—Arizona.
M. P. OWEN—Santa Cruz County.
H. E. HALLETT—Alameda County.
PERLEY P. KILBOURNE—Sacramento County.
M. B. STARR—Contra Costa county.
C. A. MCMAHON—Sutter and Yuba counties.
J. W. A. WRIGHT—Merced, Tulare, Kern and Fresno counties.
H. G. OLIVER—El Dorado, Nevada and Placer counties.
N. E. BOYD—San Bernardino Co.
S. M. PERRY—Los Angeles, Cal.
JARKD C. HOAG—California.
M. H. SMITH—Solano, Napa, Sonoma, Lake and Mendocino counties.
EU G. FRISBIE—Shasta county.
W. A. HOLLAND—Sau Mateo county.

HALL'S VEGETABLE SICILIAN HAIR RENEWER is a scientific combination of some of the most powerful restorative agents in the vegetable kingdom. It restores gray hair to its original color. It makes the scalp white and clean. It cures dandruff and humors, and falling out of the hair. It furnishes the nutritive principle by which the hair is nourished and supported. It makes the hair moist, soft and glossy, and is unsurpassed as a hair dressing. It is the most economical preparation ever offered to the public, as its effects remain a long time, making only an occasional application necessary. It is recommended and used by eminent medical men, and officially endorsed by the State Assayer of Massachusetts. The popularity of Hall's Hair Renewer has increased with the test of many years, both in this country and in foreign lands, and it is now known and used in all the civilized countries of the world.

FOR SALE BY ALL DEALERS.

SANTA CLARA, CAL., APRIL 18, 1880.

MESSRS. DEWEY & CO. *Gentlemen:*—I received the Letters Patent for my improvement in Paper Bag Machines, together with the extra copies that I ordered on the 20th ult. Also a copy each of your most valuable weeklies, containing a *full* description of my invention and notice of patent. You will please accept my thanks for the gentlemanly and business-like manner in which you have dealt with me from the beginning of my application, and feel assured that I shall take pleasure in recommending your firm to all who may wish to procure Letters Patent

Very respectfully yours, ED. O. BENNET.

P. O. BOX 246.

CHAS. C. MCMAHON, agent of the MINING AND SCIENTIFIC PRESS, of San Francisco, spent a few days in town this week. He reports a general revival of the mining interest throughout the State. He represents a live paper in the interest of mining. No miner should be without a good journal devoted to his interest.—*Oroville Register, April 30th.*

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco.

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., May 19, 1880

CANDLES.		**OILS.**	
Crystal Wax	17 @17½	Pacific Glue Co's	
Eagle	12 @—	Neatsfoot, Nal.	1 00 @ 90
Patent Sperm	25 @30	Castor, No 1	1 00 @ —
CANNED GOODS.		do, No. 2	95 @ —
Assorted Pie Fruits,		Baker's A A	— @1 30
2½ lb cans	3 25 @ —	Olive, Flagniol	5 25 @6 75
Table da	3 50 @ —	Possel	4 75 @6 25
Jams and Jellies	3 75 @ —	Palm, lb	9 @ —
Pickles, hf gal	3 25 @ —	Linseed, Raw, bbl	00 @ —
Sardines, qr box	1 67½@1 90	Boiled	95 @ —
Hf Boxes	2 50 @2 75	Cocoanut	60 @ —
Merry, Faull & Co's.		China nut, ca	70 @ —
Preserved Beef,		Sperm	1 40 @ —
2 lb. doz	3 75 @4 00	Coast Whales	35 @ 45
do Beef, 4 lb. doz	6 50 @ —	Polar	— @ 45
Preserved Mutton,		Lard	80 @ 90
2 lb. doz	3 50 @3 63½	Oleophine	— @ —
Beef Tongue	6 25 @ —	Devoe's Brl't	16 @ 17½
Preserved Ham,		Photolite	— @ —
2 lb. doz	6 00 @ —	Nonpariel	— @ —
Deviled Ham, 1 lb,		Eureka	19 @ 20
doz	4 50 @ —	Barrel kerosene	20 @ —
da Ham, ½lb doz	3 00 @ —	Downer Ker	30 @ —
Boneless Pigs Feet,		Elaine	34½@ —
3 lbs	3 75 @ —	**PAINTS.**	
2 lbs	2 75 @ —	Pure White Lead	9½@ 10
Spiced Fillets,		Whiting	1½@ —
2 lbs	3 75 @ —	Putty	4 @ 5
Head Cheese,		Chalk	1½@ —
3 lbs	3 75 @ —	Paris White	2½@ —
COAL—Jobbing.		Ochre	3½@ —
Australian, ton	— @ —	Venetian Red	3½@ —
Coos Bay	— @ 5 50	Averill Mixed	
Bellingham Bay	— @—	Paint, gal	
Seattle	5 50 @ 6 00	White & tints	2 00 @2 40
Cumberland	12 00 @13 00	Green, Blue &	
Mt Diablo	4 75 @ 5 75	Ch Yellow	3 00 @3 50
Lehigh	11 50 @12 00	Light Red	3 00 @3 50
Liverpool	8 00 @ 6 50	Metallic Roof	1 30 @1 60
West Hartley	— @ 8 00	**RICE.**	
Scotch	— @ 8 00	China, Mixed, lb	5 @ —
Scranton	— @— —	Hawaiian	7 @ 7½
Vancouver Id	7 50 @— —	**SALT.**	
Wellington	7 00 @ 8 00	Oal. Bay, ton	14 00 @22 00
Charcoal, sack	75 @— —	Common	6 50 @14 00
Coke, bush	60 @— —	Carmen Id	14 00 @22 00
COFFEE.		Liverpool fine	18 00 @— —
Sandwich Id, lb	— @— —	**SOAP.**	
Costa Rica	15 @ 18	Castile, lb	8 @ 15
Guatemala	15 @ 16	Common brands	4½@ 6
Java	24 @— 25	Fancy brands	7 @ 8
Manilla	15 @— —	**SPICES.**	
Ground, in cs	25 @— —	Cloves, lb	47½@ 50
FISH.		Cassia	19 @ —
Sac'to Dry Cod	— 3 @— 3½	Nutmegs	97½@1 10
do in cases	— 4 @— 4½	Pepper Grain	14 @ 15
Eastern Cod	— @— —	Pimento	19 @ 20
Salmon, bbls	7 00 @ 7 50	Mustard, Cal.,	
Hf bbls	3 50 @ 4 00	1 lb glass	— @1 25
1 lb cans	— @ 1 30	**SUGAR, ETC.**	
Pkld Cod, bbls	— @— —	Cal. Cube, lb	— @ 11
Hf bbls	— @— —	Powdered	— @ 11½
Mackerel, No. 1		Fine crushed	— @ 11
Hf Bbls	9 50 @10 00	Granulated	— @ 10½
In Kits	1 65 @ 1 75	Golden C	— @ 9
Ex Mess	— @ 3 25	Oal. Syrup, kegs	70 @ —
Pkld Herring, bx	3 00 @ 3 50	Hawaiian Molasses	25 @ 30
Boston Smkd Hg	50 @— —	**TEA.**	
LIME, Etc.		Young Hyson,	
Plaster, Golden		Moyune, etc	40 @ 65
Gate Mills	3 00 @ 3 25	Country pckd Gunpowder & Imperial	35 @ 75
Land Plaster, tn	10 00 @12 50	Hyson	30 @ 35½
Lime, Sta Cruz,		Fooo-Chow O	27½@ 32
bbl	1 25 @ 1 50	Japan, 1st quality	40 @ 42
Cement, Rosendale	2 00 @ 2 25	2d quality	25 @ 40
Portland	4 00 @ 4 50		
NAILS.			
Assorted sizes, keg	— @ 5 00		

METALS.

[WHOLESALE.]

WEDNESDAY M., May 19, 1880.

IRON.—	
American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	— @35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 8½
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	18 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 16
Plaw Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	— @— —
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	6 @— 6½
Bar	— @— 6½
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck, " "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.—	
10x14 I C Charcoal	— @10 50
10x14 I C Coke	10 00 @10 00
Banca Tin	— @25 00
Australian	— @20 00
I. C. Charcoal, Roofing 14x20	— @10 00
" " " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	10½@— 11
NAILS.—	
Assorted sizes	6 50@6 75

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, May 19, 3 P. M.

SILVER, ½.

GOLD BARS, 890@910. SILVER BARS, 10@18 ¾ cent. discount.

EXCHANGE on New York, 25, an London bankers, 49½@49¾. Commercial, 50; Paris, five francs ¾ dollar; Mexican dollars, 92@93

LONDON Consols, 99 5-16; Bonds (4½), 109.

QUICKSILVER In S. F., by the flask, ¾ lb. 42½@45c.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE.....Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

MISS RACHAEL SANGER.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily

BUSH STREET THEATER.

CHAS. E. LOCKE.....Lessee and Manager

THE PIRATES OF PENZANCE.

Open every evening and Saturday Matinee.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official noticee of their companies in this paper, as the cheapest appropriate medium for the same.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 29th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, May 21st, 1880, and day of sale to Wednesday, June 23d, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Fifth day of May, 1880, an assessment (No. 42) of 20 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of June, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the Fourteenth day of July, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Palmer Ice and Refrigerating Company.—

Location of principal place of business, San Francisco, California. Location of works, 224 Fremont street, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 21st day of April, 1880, an assessment (No. 2) of 85 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 303 Montgomery street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the 24th day of May, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the 17th day of June, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. O. C. PALMER, Secretary.

Office—No. 303 Montgomery St., San Francisco, Cal.

ANNUAL MEETING.

OFFICE OF THE

Pioneer Consolidated Mining Company,

A meeting of the stockholders of the Pioneer Consolidated Mining Company for the election of a Board of Trustees to serve for the ensuing year and for the transaction of such other business as may come before the meeting, will be held on MONDAY, the Twenty-Fourth day of May, 1880, at 2 o'clock P. M., of that day, at the office of the Company, Room 4, 300 California street, San Francisco California. Transfer books will be closed on Friday, the Twenty-First day of May, 1880, at 3 o'clock P. M. J. M. BUFFINGTON, Secretary.

Office—Room 4, 309 California street, San Francisco California.

DIVIDEND NOTICE.

OFFICE OF THE

Black Bear Quartz Mining Company,

Room 13, Safe Deposit Building, San Francisco
May 16th, 1880.

A dividend (No. 73) of Twenty-Five (25) cents per share was declared on the capital stock of the Black Bear Quartz Mining Company, payable immediately.

WM LETTS OLIVER,
Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, Room No. 37, San Francisco, May 15, 1880. At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 55) of Fifty Cents (50c) per share was declared, payable on THURSDAY, May 20, 1880. Transfer books closed until 21st instant.

W. W. TRAYLOR, Secretary.

W. T. GARRATT'S
BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings

Hooker's Patent Celebrated

STEAM PUMP

The Best and Most Durable in use. Also, a variety of other

PUMPS

For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,
For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF
IRON PIPE AND MALLEABLE IRON FITTINGS.
ALL KINDS OF
WORK AND COMPOSITION NAILS,
AT LOWEST RATES.

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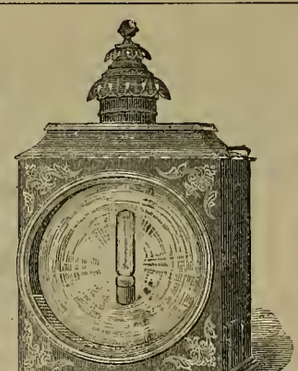
PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.



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HYDRAULIC, MINING AND LOCOMOTIVE HEAD LIGHTS. THE BEST AND CHEAPEST.

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Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

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Iron, Steel and Galvanized Wire
Of all sizes on hand or made to order.

Barbed Fence Wire.

Sole Proprietor of
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For the Transportation of Ores, Etc.
Send for a Circular.

A. S. HALLIDIE.
Office, No. 6 California St., San Francisco

EVERY FOOT WARRANTED.

BELTING AND PACKING.

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STEAM AND SUCTION HOSE,
AIR, OIL AND BREWERS' HOSE,
CAR SPRINGS, VALVES, GASKETS, Etc.

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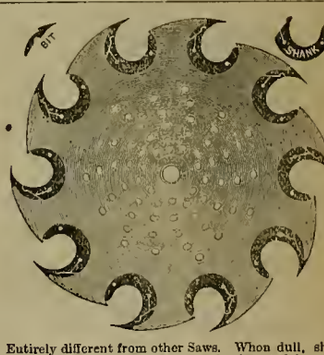

Entirely different from other Saws. When dull, sharp teeth, which only cost a trifle, can be inserted in a few minutes, without taking the saw off of the mandrel, and no skill is required in doing it. Send for Catalogue showing their vast superiority. More of them are being sold than of any other kind, and we are altering all other kinds to the Chisel Tooth.

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Importers and Dealers in every description of

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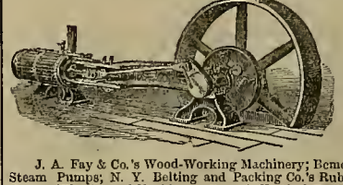
Sole Agents for the Pacific Coast for



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Engine Company.

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PRACTICAL BOILER MAKER.

Marine, Stationary and Portable Boilers, Smoke Stacks Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Circlers, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK,

Repairing promptly attended to at the lowest possible terms.

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MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL

Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

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MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

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Golden State Pressure Blowers.

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Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

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Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filtors, Blow-up Tanks, Coolers and Receiving Tanks.

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Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for use on land. Water Pipe, Pump Air Column, Fish Tanks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

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ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING, AND MINING MACHINERY INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERT. ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, ETC., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

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STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.

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Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates Orders solicited and promptly attended to.

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Plunger Jigs. Revolving Screens.
CRUSHING ROLLERS. SAMPLE GRINDERS.

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STEAM ENGINES, BOILERS, STAMP MILLS, FRUE VANNERS
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Mining, Milling, Smelting and Concentration of Ores.
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Howell's Improved White Roasting Cylinders.
REVOLVING CYLINDERS AND ORE DRYERS.
Hoisting and Pumping Machinery.

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HERCULES POWDER

Derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

No. 1 (XX) is the Strongest Explosive Known.
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2,000 Tons Best Cumberland Coal. Ex "Challenger," from Baltimore.

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Ex "Seminole."

300 TONS LEHIGH LUMP COAL, Ex "Tam O'Shanter,"

Also all brands of **PIG IRON** in store.

FOR SALE IN LOTS TO SUIT.

J. MACDONOUGH, 41 Market St., cor. Spear, San Francisco.

In consequence of spurious imitations of

LEA AND PERRINS' SAUCE,

which are calculated to deceive the Public, Lea and Perrins have adopted A NEW LABEL, bearing their Signature thus,

Lea & Perrins

which is placed on every bottle of WORCESTERSHIRE SAUCE, and without which none is genuine.

Ask for LEA & PERRINS' Sauce, and see Name on Wrapper, Label, Bottle and Stopper. Wholesale and for Export by the Proprietors, Worcester; Crosse and Blackwell, London, &c., &c.; and by Grocers and Oilmen throughout the World.

To be obtained of CROSS & CO., San Francisco.

Rotary Pulverizer,

(WHITE'S IMPROVED,)

For Disintegrating Ores and Other Substances.

GUARANTEED TO BE EQUAL IN CAPACITY TO A

HUNDRED STAMP BATTERY!

IS FITTED UP WITH

Homogeneous Steel Beater Bars.

Found to be more durable than either Hard Steel or Soft Iron. Dry-crushing the hardest rock; will last for months, and without the slightest danger of breakage.

The Pulverizer requires about one-third the power usually expended for the reduction of the same amount of Ore by Stamps.

Price List, Etc., of the White Rotary Pulverizer.

No.	Tons Per Hour.	Inches Diameter.	Revolutions Per Minute.	Horse Power Required.	Shipping Weight.	Lumber Required.	Price.
1	6	56	600	40	12	6,000 ft.	$5,000
2	10	72	470	60	15	9,000 "	8,000
3	16	84	400	75	20	12,000 "	10,000

The Repairs on the Pulverizer will not exceed those of a 10-Stamp Battery.

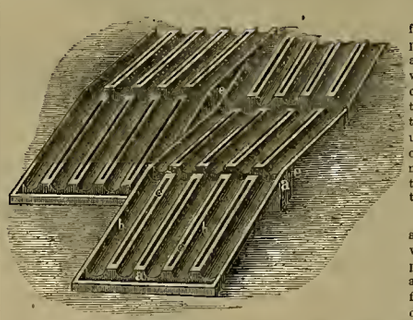
The Shipping Weight of the entire apparatus is not one-eighth of that of Stamp-Mortars required to do an equal amount of work. ☞It can be placed and put running at the Mill in from fifteen to twenty days.

Address GEO. W. WHITE, Inventor.

Manufactured exclusively at the ÆTNA IRON WORKS, 217 Fremont St.

San Francisco, Cal., January 1st, 1880.

Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

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Who have the sole right of manufacturing this Riffle, and who will receive and attend to all orders.

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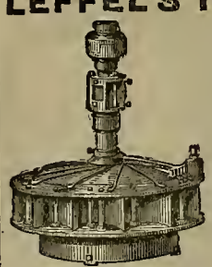

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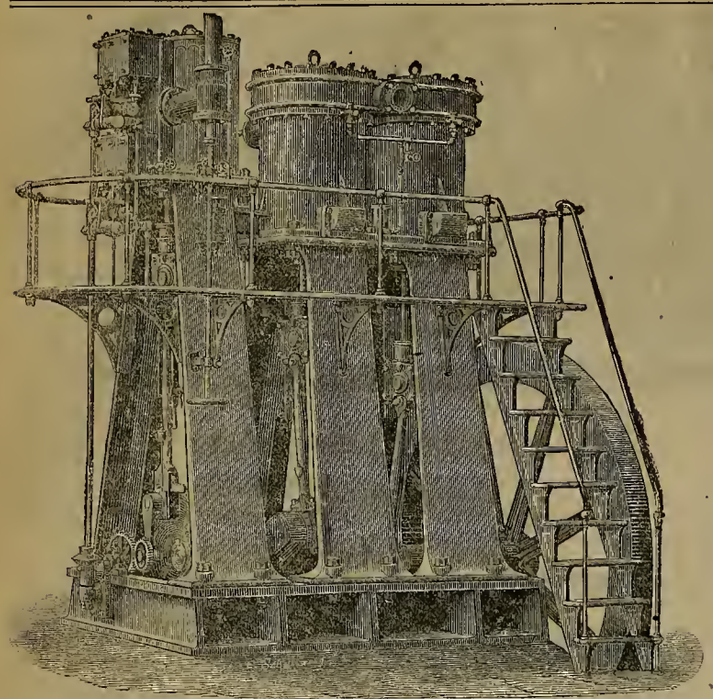

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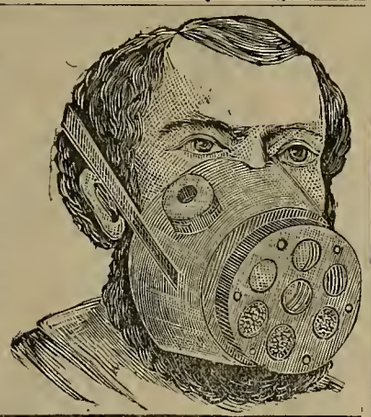

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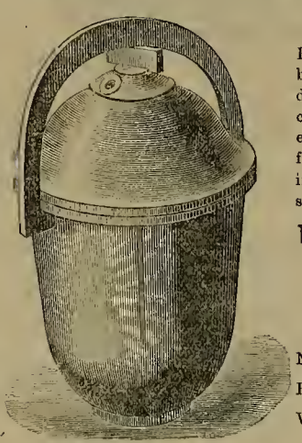

The advantage of this Retort over the OLD FLAT PATTERN is, that it can be filled full of Amalgam, thereby holding more than the old style, besides avoiding all danger of an explosion owing to the crown space in the cover which allows for the expansion. They are made extra heavy, WELL GROUND in the joints, and are furnished with a strong Norway clamp, having a wrought iron key which can be driven in or out of place by a single stroke of a hammer.

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We Make Seven Sizes, as follows:

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Holds Pounds Quicksilver	12½	25	38	50	63	75	125
Weight each.....	10 lbs	15	18	25	31	44	65

Mortars and Pestles,

GROUND INSIDE.

Size—Quarts....	½	1	2	4	6	8	12	16
Hight—Inches ...	37	5	6	7½	8½	9	11	12
Weight—Pounds	6½	9	16	22	37	43	72	86

Bullion Ladle.

Forged from one piece of Charcoal Iron, eight inches in diameter by four inches deep.

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Indorsement—Pool Mine, Hornitos, Mariposa county, Cal., May 10, 1880.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 29, 1880.

VOLUME XL Number 22.

Reverberatory Roasting Furnaces.

We give engravings of a single roasting furnace taken from Kuetel's "Roasting of Gold and Silver Ores." Figure 1 shows the section and Fig. 2 the ground plan. Reverberatory furnaces is the name applied to all horizontal hearth furnaces provided with grates and fireplace on one side, and a flue connected with a chimney on the other. The draft here is created by the chimney instead of by bellows, as in blast furnaces. Therefore, only such fuel is used which gives a flame, and consequently no charcoal, coke or anthracite is serviceable unless in a gas reverberatory furnace, where gas (carbonic oxide) is produced from charcoal or other fuel—sometimes also by the aid of compressed air—and burned. The reverberatory roasting furnaces are constructed in various ways. There are single furnaces with but one hearth, and double furnaces with two hearths, one above the other. Sometimes above the second hearth there is a third one for the purpose of drying the charge. Long furnaces are preferable.

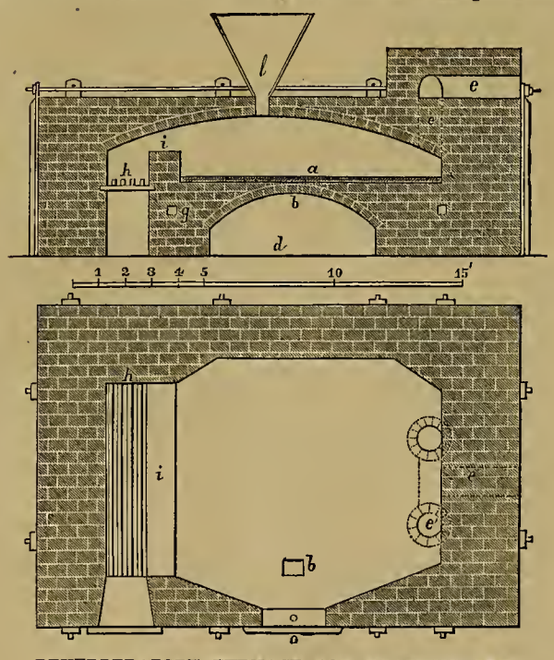
The bottom, *a*, or the hearth, is made of the hardest bricks, laid edgewise, and as close as possible. Some masons lay the bricks flat. This mode is cheaper and quicker, but inferior and less durable than the former way, and requires a more carefully prepared foundation. The very best bricks must be selected for the hearth. *b* shows the discharge hole in front of the hearth. It is more convenient to draw the ore toward the front hole than to have a door for this purpose behind, but circumstances may decide for such discharge doors. The flue, *e*, is in connection with the flue-holes, *c*, in the arch, as indicated by dotted lines in Fig. 3, and is from nine to ten inches in diameter. The flue-holes in the arch have the advantage that no ore can enter when being stirred, as often happens when the flue commences at the hearth. The distance between arch and hearth near the bridge is twenty to twenty-one inches, and near the flue only eight inches. The flue leads into the chimney in any suitable direction, either directly or through a dust chamber. Often the flue is led under the floor (when the chimney is at some distance from the furnaces), and is made wide enough to serve as a dust chamber—say two feet wide and three feet high, or wider if several furnaces are connected therewith. The chimney is from twenty to fifty feet high, and from one and one-half to three or four feet square in the clear. On the top of the chimney an iron cover, controlled by a chain, regulates the draft. This is practicable only when but one furnace is attached to the chimney, otherwise dampers must be provided for each furnace in the flue. The bridge, *i*, is much exposed to injury by fire on one side and by raking on the other. It is, therefore, advantageous if the upper part, or the whole bridge, can be made in two or three parts, and of some fire-proof stone—sandstone, granite or some conglomerate which does not burst when heated. The grates, *h*, are twelve to sixteen inches below the top of the bridge, eighteen inches wide, and from six to seven feet long. The space between the grate-bars is one-fourth to one-half of an inch.

In the roof near to the bridge is an opening four to five inches square, of cast iron, in connection with a funnel, *l*, of sheet iron. This funnel must be large enough to receive one charge of the ore. A slide keeps the ore in the funnel. The roof must be either eight inches thick or the double length of the brick; that is, sixteen inches. Under the hearth there is an arched space, *d*, into which the roasted ore is drawn through the discharge hole, *b*, either directly into an iron car or on an inclined floor, on which the ore slides from underneath the furnace. In front this space is shut up by brick work. For the purpose of easy drying it is well to have open some holes, *g*, for the escape of dampness. It is not necessary to build the block under the hearth solidly of bricks. The space inside is generally filled up with rubbish of bricks and stone, or it is still better to build the floor on arches.

St. Louis is organizing a mining stock exchange.

Our Product of Gold and Silver.

The United States Treasury Department is now engaged, through its Mint Bureau, in collecting statistics from the gold and silver mines in all parts of the country, for the purpose of ascertaining with something like precision our production of the precious metals. Hitherto this important business has been done in an immethodical and perfunctory way, and the figures were only roughly approximate; but now that the task is undertaken by the general Government, we have reason to expect systematic and highly satisfactory results. We learn that the responsible duty of collecting the statistics relating to California, Nevada, Oregon, Idaho, Montana, Colorado, Dakota, Utah, Wyoming and Arizona has been assigned to Mr. A. M. Lawyer, of the United States Branch Mint in San Francisco. Superintendents of mines, or the managers of mining corporations, need have no hesitation in giving full and trustworthy returns, as assurance is given that the details of their statements will not be published, but only



REVERBERATORY FURNACE FOR ROASTING ORE.

the total product of each State and Territory. The official report of these statistics is to be completed next September. In order to obtain the information desired, circulars have been sent to postmasters, registers of United States Land Offices, superintendents of mines and mining experts in each county in every State and Territory, requesting them to forward to Mr. Lawyer the name of every private and incorporated mine which had come to their knowledge, with the address of the manager. By these means the list of private and incorporated mines already obtained embraces over 2,000 names of the superintendents of mines, to whom circulars were subsequently sent, requesting them to give the product of gold and silver for the preceding six months. We are informed that fully 600 have forwarded replies. Now that a good method has been adopted for procuring trustworthy data respecting one of the great industries of the United States—indeed, one of the greatest of the world—it is to be hoped that it will be continued and enlarged, so that hereafter the business man, the legislator and the political economist, shall have certain knowledge respecting our production of gold and silver.

The labor strikes in the north of France are about ended.

Japanese Railroads.

Unlike their Chinese neighbors, the Japanese seem to have a keen appreciation of the advantages of railway communication, and are rapidly extending the system in the various islands of the group. Already two lines of railroad have been completed in the island of Niphon, and a third line is in the course of construction in the island of Jesso, the most northerly of the Japanese group. This latter road will extend from the harbor of Otaru, situated on the west coast of Jesso, to extensive bituminous coal fields in the interior. The estimated length of this line is 54 miles. On Saturday last, Mr. Joseph M. Crawford, formerly of the Texas-Pacific railroad, accompanied by several of his former associates, took his departure on the steamship *Gaelic* for Yokohama, whence he will proceed to the field of the new road. We learn that the rails will be of English make, but that the rolling stock and engines have been already ordered from American manufacturers. The trains will be supplied with the Westinghouse brake, and an improved "spark-catcher." The latter precaution is of the first necessity; for were a chance spark to fall on one of the lightly-constructed and highly inflammable houses by the side of the railroad, entire villages would be swept away, and a natural but intense feeling of hostility would be aroused against the new enterprise.

Paper Boxes from Pulp.—A late invention makes paper boxes directly from paper pulp. Boston takes the lead in the manufacture of these boxes, which are seamless, and can be made to any size or shape. The process, as described, is, that after being dried, the boxes are run through a second machine at the rate of sixty per minute, receiving, under a pressure of four thousand pounds, each embossing as may be necessary. From the time the paper stock is taken from the bales until the perfect box is turned from the machine, manual labor is entirely avoided. By the use of one set of machines, it is said, 30,000 boxes can be produced per day, at less than one-third of the lowest market price of hand-made goods, and doing the work of two hundred hands, as the process is ordinarily conducted. The paper box has come into use for an infinite variety of purposes, and this success is an important contribution to invention.

Frightful Railroad Disaster.

Last Sunday afternoon there occurred the most frightful railroad disaster that has ever happened in California, by which sixteen persons were killed instantly, or have since died of their wounds, and forty odd were more or less seriously wounded. The news of the terrible calamity produced intense excitement in the city, for it was known that a large picnic party—residents of this city, and comprising men, women and children—had gone over the road which was the scene of the disaster.

The accident occurred on the local train of the South Pacific Coast railroad on the route between Santa Cruz and Felton. Attached to the train were three flat open cars, railed at the sides and ends, and filled with seats, each car containing eleven seats. Report says that these seats were not only crowded, but that passengers were standing crowded between them. They were also seated on the railings. The gauge of the road is three feet. The cars are seven feet six inches wide, and the side railing projects four inches, giving a total width of eight feet two inches. This would cause the car to project over the rail about two feet seven inches. Notwithstanding the crowded and "top-heavy" condition of the cars, all went well until the train passed through tunnel No. 7, where the road is downward and curved. It is reasonable to believe that in passing over this curve the cars swayed greatly, and some of the passengers becoming frightened, crowded to the inside and caused the cars to tip and jump the rail. The horror culminated. The unfortunate people were thrown in a heap against the rocky bank, a struggling mass of men, women and children, the cars passing over and cruelly lacerating and crushing those who were near the track.

This appears to be a probable theory of the cause of the disaster, although others are given. It is alleged that neither the engineer, conductor nor the brakemen had ever been over the road before, and did not know the peculiarities of its grades and curves; that after passing through the tunnel and taking the down grade there was a sudden increase of speed, which the brakeman did not or could not control. And it is alleged finally that the train was not supplied with the air-brake, which, in the hands of a skillful engineer, would, most likely, have kept the train under control and prevented the fatal accident. The schedule time on that part of the road is 19 miles per hour up grade, and 20 miles per hour down grade, which is said to have been pronounced a safe rate of speed by competent railroad men. Whether the speed of the train at the time of the accident was in excess of the schedule can only be determined, if at all, after a thorough investigation by the authorities. Nothing less than a full, intelligent and searching investigation will, or ought to satisfy the public, to say nothing of the bereaved families and friends of the victims. Now and henceforth the railroad is the common highway for civilized communities; and those communities will demand, and railroad companies must be prepared to give, absolute assurance of at least ordinary safety to life and limb and property.

An Iron Furnace in California.—The first iron blast furnace in California is now in course of construction at the Clipper Gap iron mountain, on the Central Pacific railroad, 182 miles east of San Francisco. At this point there is an abundance of hematite and magnetic ores, and an almost inexhaustible supply of wood fuel and limestone convenient for flux. Including all contingencies, $12 will cover the cost of pig metal worth $30 at least. This place is destined to be a great iron center. The entire prize is in the hands of men who known how to utilize it, and it is destined to be the parent of many new industries yet to follow, and who can foretell their extent. If we can produce cheap iron there will be nothing to forbid the building of iron ships on the Pacific. We are informed that a furnace is contemplated at Port Townsend, Puget Sound, Washington Territory. Near navigable waters is a vast expanse of very rich bog ore, practically inexhaustible. Iron and magnetic ores abound, as does timber for charcoal.

The Comstock Compared with other Fissures.

In a previous number of the Gold Hill *News* the yield of the twelve ore bodies found in the Comstock between the surface and the 1000 level was compared with the yield of the two ore bodies found between the 1000 and 2000 levels, showing that the latter returned to the stockholders in dividends nearly 400% more than the former, thus leading up to the conclusion that while fewer ore bodies were likely to be uncovered at great depths, they would be found to be both larger in extent and of richer matrix than these nearer the surface, and that, consequently, the prospects of the lode were such that it might be expected to yield more than a fair return for the investments necessary to continue its exploration at still greater depths than prospectings have yet been carried. The object of the present item is to compare the Comstock with other silver-bearing lodes, and by that comparison to show what may be expected of it in the future.

History shows that wherever a true fissure vein has been found it has never been worked out. Such veins have been, in fact, worked for ages without any perceptible diminution in their yield. Where ores have decreased in value, the ore bodies have increased in size, the increase of the one compensating for the loss of the other. Some have even increased their yield, the quality of the ores remaining unchanged. Others have been found to deteriorate from veins of silver to those of baser metals. The latter is, in fact, the most disastrous of all the vicissitudes attendant upon silver mining.

Some of the silver mines of Mexico have been abandoned time after time and have as often been reopened by adventurous speculators and found to yield largely. The reasons for their abandonment have been various. Some have been closed on account of lawsuits, others on account of political changes, others again because the ores became low grade or gave out entirely as was supposed, but when titles have been perfected or peace restored or new methods of working ores invented, whereby those of lower grade have been made to pay, and the mines have been reopened, they have in all cases yielded a fair remuneration for the expense of working them. In some, rich bodies of ore have been discovered where before none were supposed to exist.

The Valenciana mine on the Veta Madre of Guanajuato was reopened in 1760 on a part of the lode considered formerly to be of no value, and at the depth of a few hundred feet a bonanza was struck which yielded, up to 1810, $30,430,290. During that time a place of 7,000 inhabitants sprang up there. Then the rich ore of the mine gave out at the 1200 level. A large shaft was then sunk 2,000 feet and ore found, but of too low grade to pay for working; consequently the mine was abandoned and allowed to fill with water. In 1825 the Anglo-Mexican company drained the mine of water, but the expense of pumping consumed all the profits of mining, and it passed into the hands of the United Mexican company, and has since been made to yield largely.

The Veta Grande, at Zacatecas, from 1548 to 1832, yielded $666,000,000. This lode has about the same dip and is of the same general formation as the Comstock. Its clay selvages inclose large portions of country rock. It is, however, much narrower than the Comstock, varying from a few feet in width to 80 feet at the widest place. Near the surface the ore was exceedingly rich, but became poorer with depth, although more evenly distributed throughout the vein. For some time it was abandoned on this account, but at present is yielding well.

In the two mines above mentioned the ores are of lower grade as the depth is increased, but the equal distribution of the ore throughout the lode, together with the larger amount yielded, make them the sources of an immense production of silver bullion. It is important to note, however, that throughout all the levels of these mines the ores retain their silver-bearing quality. In the central part of Mexico this is also the rule, while further north where ou and near the surface the ores were rich in native silver, the ores grow poorer with depth owing to the predominance of lead, rendering them of baser quality. This is true of mines also in the Carpathian mountains, in the mines of Shemnitz, and in the vein of the Gross Gruhe in Felsobanya, all of which yielded immensely near the surface where they were worked by the Romans. In depth all the ores of these mines, however, changed to base metal ores, and they consequently yield but small profits although worked in the economical manner characteristic of European mining.

The veins of the Hartz mountains show the same deterioration, and it is only on account of the large quantities of low grade ores extracted that they can be worked with profit. The veins of the Hartz mountains have been followed down over 2,000 feet, and those of the Shemnitz nearly 4,000 feet.

In contrast to these mines are those of Freiberg where the ores, like these of the Comstock, increase in richness with depth. The mines of Quatorce, in Mexico, belong to the same class.

The veins in all of these mines, however, are narrow and frequently cross themselves, forming a kind of net-work of fissures. The same is true of the mines of Chanarcillo, in Chile, Quatorco in Mexico, Pasco in Peru, Freiborg in Saxony, Kougsberg in Norway, and Austin in Nevada. All of these, however, more or less resemble the Comstock in retaining the richness of their ores at great depths. In structure the Comstock more closely resembles the veins of Felsobanya and Shemnitz in Hungary, the Veta Madre of Guanajuato, the Veta Grande of Zacatecas, the Biscana de Real del Monte of Mexico, and the Potosi of Peru. They are all remarkable for their size as well as for permanence of their structure.

It is these large veins of Mexico and the Gang-zug of the Germans which have produced most of the silver in the world. These veins all resemble each other and the Comstock in their magnitude, their comparatively recent origin, and in their close connection with volcanic rocks. If we except the lode of Guanajuato, where in entering a different geological formation, a barren zone is reported on good authority, all these veins have been productive of good ores at great depths, although differently distributed in regard to the various levels. In them all the ores of the surface seem to have been concentrated into small bodies, but with greater depths the ore bodies have also increased in size. Unlike the Comstock, however, some of them have developed lower grade ores with increase of depth.

We know that for 2,500 feet the Comstock retains its silver ores, thus resembling the Mexican mines and differing from those of Hungary. Although the ores found on the surface of the Comstock were considered to be very rich, yet in but few instances did they return a greater amount per ton than those below the 1000 level. The average above that level was, as has been shown, $29.65 per ton. The highest for any large quantity was $48; the lowest $7.89 for surface rock. In the middle of the upper portion of the vein the average was $23. Below the 1000 level the average was $61.50. The averages of the Crown Point bonanza was $38 per ton, and of that of the Belcher, $46.50. The average of the Con. Virginia up to Jan. 1, 1878, was $93.70; of the California, up to the same period, $94.65. The ores of the latter mines came from a greater average depth than those of the former. The increased richness of the Comstock ores at increased depths, the character and size of the vein, and the comparisons above made, warrant the following conclusions:

First—The Comstock will continue to carry ore to whatever depth the vein reaches.

Second—That ore will retain its present characteristics.

Third—It is more than probable that extensive bodies of ore of increased richness will be found at greater depths.

Fourth—That these ore bodies are more likely to increase than decrease in size.

Fifth—That the yearly bullion product of the lode will be variable, owing to the rapid extraction and milling of ores when found, and the tedious work of prospecting at great depths.

Sixth—Greater equality in the distribution of ore bodies need not be looked for.

Seventh—That barren sections will be found in the immediate vicinity of ore bodies.

Eighth—That large ore bodies of high grade are more likely to be encountered than a general diffusion of low-grade ores throughout the vein.

Ninth—That barren zones will increase in dimensions as ore bodies increase in size.

Tenth—That for years to come, mining on the Comstock will neither be relinquished nor cease to be a remunerative industry.

Silver Mining in Maine.

Judge Hetzel a few days ago received a letter from a mining superintendent in Maine, who has worked in the mines of this coast. From his description of affairs it would seem that mining in that section is much different from here; in fact it is quite a genteel business and more agreeable than otherwise. He calls his mine the Gilt-edge Silver Stocking, and from present indications the prospects are very encouraging for finding a large body of silver ore. The assays are high and show but little base metal. "We are situated fifty-five miles north of Bangor and only one hundred feet from tide water. I have my own horses and buggy; board in a farm house; pay $3 per week for board, and have the historical spare room to sleep in. The water is deep enough to float the *Great Eastern*; I go fishing and catch perch, shad and lobsters. The climate is delightful and every air is filled with sweet memories of the past. Young ladies are numerous, well educated and lovely in disposition. Such sunsets can be seen in no other place. I am employed by gentlemen, who appreciate what is done for them, and make things pleasant for these with whom they associate. As regards titles to the claims, there can be no dispute. The land was taken up shortly after the *Mayflower* landed our Pilgrim Fathers and has come down from father to son." The writer concludes by saying that he is happy and contented, and never yearns for the return of his experiences on the Pacific coast. Flowers grow at the base of the waste dump of his mine, and the wood-yard is sheltered by weeping willows and waving pines.—*Bodie Free Press.*

Copper Near Mason Valley.—An intelligent American from Pizeu Switch informs the *Esmeralda Herald* that when the projected railroad is completed a large amount of copper ore will be shipped from the hills near Mason Valley for reduction elsewhere. As copper is very high in Eastern markets just now, quite a thriving business may be anticipated by our Pizen Switch neighbors in addition to the lively boom in spuds and fodder which will be sure to follow.

Deep Mining Shafts in Europe.

Twenty years ago the deepest mining shafts in the world reached only about 2,000 feet below the surface. The very deepest, we believe, was a metalliferous mine in Hanover, which had been carried down to the depth of 2,900 feet. The deepest perpendicular shaft today is the Adalbert shaft in a silver-lead mine in Przibram, in Behemia, which, in May last, had reached the depth of 1,000 meters—3,280 feet. The attainment of that depth was made the occasion of three days' festival, and still further noticed by the striking off of a large number of commemorative silver medals, of the value of a florin each. There is no record of the beginning of work on this mine, although its written history goes back to 1527. Quite recently an elegant commemorative volume has also been written and printed, which an English paper before us says is "most interesting to those who have a taste for either the actualities or the antiquities of mining industry."

There are two other localities, however, where a greater depth has been reached than at the Adalbert shaft, but not in a perpendicular line. These are, first, the Rocksalt bore hole, near Sperenberg, not far from Berlin, which a few years ago had been bored to a depth of 4,175 feet; and, secondly, the coal mine at Vivier Lsums, in Belgium, where the miners, by shaft sinking, together with boring, have reached a total depth of 3,542 feet. Taking each singly, the deepest shafts in the world, at the present moment, group themselves according to the following order:

1. The already mentioned Adalbert shaft, 3,280 feet deep. As the top of this shaft is 1,732 feet above the sea level, the bottom is, of course, 1,548 feet below it.

2. Two shafts near Gilly, in Belginm, are sunk to the depth of 2,847 feet. At this depth both were connected by a horizontal drift, from there an exploring shaft was sunk to a further depth of 666 feet, and from there again a trial hole, 49 feet in depth, is put down, so that the total depth reached is 3,542 feet. As they did not, in the bore hole, discover the sought-for coal seam, they have returned to the shaft at the 2847 level.

3. The Eimgkerts shaft of the Lugauer coal mining company, Rhenania, Lugau, in the kingdom of Saxony, is 2,653 feet deep.

4. The Sampson shaft of the Oberhartz lead and silver mining works, near St. Andreasberg, Hanover, has a depth of 2,437 feet, and is at present the deepest shaft of Prussian mining.

5. The winding shaft of the Resebridge colliery, near Wigan, Lancashire, England, has a depth of 2,458 feet. Coal is drawn from the "hanging on" at the 2418 level; the time of the cage running this distance being 55 seconds; the winding rope has, therefore, an average speed of 44 feet per second.

6. A shaft at the coal mines of St. Luke, near St. Chaumont, in the Loire department, France, reaches 2,253 feet.

7. The shaft of the Dunkirk colliery, near Dukinfield, Lancashire, is 2,069 feet deep, but the mining is prosecuted to a further depth of 755 feet by shafts from the lower levels, making a total depth of the mine of 2,824 feet.

8. The deepest shaft of the collieries near Ronchamp, in France, is 1,881 feet. A similar depth has been reached by the argentiferous mine near Kongsberg, in Norway. The mines belonging to the Roroe copper works, in Norway, have worked to the depth of from 2,540 to 4,270 feet.

9. The Amelia shaft, in the mine works near Schemnitz, in Hungary, is 1,782 feet deep.

10. The No. 1 Camphausen shaft, near Fishbach, in the department of the Saarbruck collieries, has now reached the depth of 1,650 feet, and may possibly become the deepest shaft in Prussian coal mining.

Although the depths to which the shafts enumerated have penetrated into the interior of the earth in the art and practice of mining may appear mighty, and may be an expressive witness of the great progress made in mining pursuits; yet, on the other hand, the above results may be considered insignificantly small when we compare them with the extent of the earth's crust and the diameter of the earth.

The deepest bore hole in the world is the artesian spring at Potsdam, in Missouri, which reaches a depth of 5,500 feet.

Copper Mining.—In a recent issue the *News* called attention to the fact that copper mines were in demand in this section, and that that branch of industry promised to greatly increase in the near future. In confirmation, D. H. Jackson, superintendent of the North Bonanza and Flowery mines, has purchased the copper mine in Mason valley, formerly owned by J. Daniels. There is an abundance of very rich ore in the mine. It was formerly worked by the owner and the ore hauled to Dayton for the manufacture of bluestone. There is not a timber in the mine. In extracting the ore Mr. Daniels left great pillars of ore—10 to 15 feet in diameter—as supports. Mr. Jackson will put up a furnace at the mine and smelt the copper, running it into ingots for transportation. An abundance of charcoal can be obtained in the immediate neighborhood of the mine. There is also plenty of water in the vicinity. The only drawback likely to be experienced in copper mining is that when the mines of Lake Superior find competition arising in the west, they will throw a large amount of copper on the market to reduce the price to compel suspension here, where labor and supplies command higher rates than there.—*Gold Hill News.*

Boulder Gold and Silver Mining.

There is authority for saying, says a correspondent of the Boulder *Courier*, that the broad, gold-bearing mineral belt that begins on the northerly side of Boulder county, at Jamestown, Balarat and Ward, and thence trends southwesterly by Gold Dirt and Central City in Gilpin county, and ends at Empire, in Clear Creek county, is not only the best fissure gold mining district in the Rocky mountains, but, for its extent, the most productive known in the world.

The little patch on this belt, of which Central is the center, is the best developed, because the pioneer mining energies of the country early centered there; and centered there because the ores yielded their gold more readily to the crude process of the common stamp mill. But the mining progress in Boulder county has been steadily onward, and it remains to be seen which county has the butt end of the belt. But it becomes us not to boast, as the day is past when "good indications" count for much in mining. What is the annual product of our mines, and what their capacity for increased production?—these are the questions of interest at home, and the questions asked concerning us by those from abroad who would invest.

It is noticeable that at the very time a certain class of miners began to leave this section and run to Leadville and the greener fields of the Gunnison, at that very time the yield of our mines began to augment, and have not yet ceased to increase, month by month. While we wish a fortune to every honest miner who goes to the Gunnison, we have seen too many such stampedes not to know that hardly one in a thousand will draw the coveted prizes. The toil and expense are vastly greater, and the chance of drawing a big prize no better than by investing a few dollars in a Denver lottery.

Yes, these roving pioneers are heroes in their way, but generally enduring hardness for the benefit of those who follow. In mining, one set of men lays the foundation, and another builds thereon. It was said of an ancient people: Their strength is in their rest. This is true of prospecting for the precious metals, and has a good illustration in the example and final fortune of Mr. R. G. Williamson, of this county. It is about 15 years since he set his stake on the sunny slope of Sugar Loaf, supporting himself by a little ranching and a little gulch mining, and all the while prospecting and panning, and learning, and the result appears in the development of one of the very best mines ever discovered in Colorado. His strength has been in his rest. Had he wandered all Colorado over, there is not one chance in a thousand that he would have done as well.

There is a strange fascination about the idea of an adventure to Leadville or the Gunnison, in the hope of happening to the lot of a bonanza king; but it is believed that to-day, in proportion to the number of men engaged, there are more mining fortunes making in this county, by the discovery of rich mines, and by legitimate traffic in mines, passing them into the hands of Eastern men who have money to invest, and like mining property, and have the means to work it to the greatest profit, than are made, or will be made, on the track of the great rush to the southwest.

Pinal Mining District.

If those timid persons who fear for the future of Tucson would give a little attention to the rich deposits that lie close by, heavy deposits from which, in future years, are sure to flow rich streams of bullion, they would save themselves much trouble. There is to-day scarcely a point in the Territory that has been so utterly passed by as the Sierritas, and yet no region has a better formation, or more promising surface veins. The present season, however, promises to witness a radical change. Several claims have recently been found of such apparent excellence as to demand attention, and a constantly increasing activity is to be noted in the working of prospects.

A little southeast of the San Xavier well is a considerable camp, and a number of prospects are showing excellent and steady ore. The Esperanza which lies ten miles south of the well, is being steadily developed and looks finely. From the bottom of the main shaft, and from a drift up the hill from the 100 level, a fine galena ore which assays $100 per ton is coming up, and the erection of smelting works for the mine is only a question of time.

Several fine looking claims near the Esperanza will shortly be in the hands of good working companies.

Two and a half miles west of the Esperanza Messrs. Tarr & Randle are opening up the Providence, an unusually fine looking claim. And still nearer the mountain summit James Blade and others are superintending work that shows ore which men in some big camps would be glad to see.

On the west slope of the range, J. McC. Elliot and others have several claims which show beautiful galena, and the owners think they have the coming bonanza.

There are other properties that will be heard from daily. The motto of the Sierritas seems to be—"Slow, but sure."—*Arizona Star.*

Prof. Proctor says that he finds the interest in scientific matters much more widely spread in America than in England, more people attending lectures here and reading and thinking intelligently upon these subjects.

MECHANICAL PROGRESS.

An Interesting Experiment.

A trial of Dr. Charles Holland's hydro-carbon retort was made lately on the Long Island railroad, between Long Island City and College Point. The invention, which consists of an apparatus for the decomposition of water into oxygen and hydrogen, and the incandescence of these two gases with the aid of superheated steam, with the carbon of petroleum or naphtha, so that a combustion, which is almost perfect, is obtained, was applied to the boilers of the great locomotive "Hempstead," which is one of the largest locomotives in the United States. Very little alteration of the engine was necessary. J. W. Houchin & Son, the Brooklyn engineers, were in charge of the arrangements, but they had to do little more than place the retort in the fire box and connect it with the naphtha tank in the tender. There were 180 jets of a flame at white heat in the retort, and the flames on trial experiments made before the train was started were turned off and on almost instantaneously. When the train was put under way the advantages of the retort became instantly apparent. There was little smell from the engine and no smoke, and of course no cinders or sparks. During this trial trip an estimate of the amount of naphtha consumed was made, and it was found that the cost was 7½ cents for a run of 6 miles, which is much less than the consumption of coal would amount to. Engineer Edward Harris, who ran the train, said that he was perfectly satisfied with the working of the retort. One of the advantages claimed for the retort system is that when no power is needed, as on down grades, the fire can be cut off and the fuel saved. So far as the application of the retorts is concerned, Dr. Holland says that they can be fitted to any engine, and the experiment clearly showed that the difference in the manner of furnishing the motive power made no difference in the manner of controlling the engine.

In connection with the above it may be interesting to state that the Germans appear to be making rapid progress in applying gas firing to steam boilers. Herr G. Liegel, of Strausleud, announces that by a system developed by him he has obtained very favorable results. During an experiment lasting 72 hours, he evaporated in a boiler having a heating surface of 27.1 square feet, 9,766 pounds of water, having an average temperature of 62 degrees. In order to do this he used 1,058 pounds of coke. Taking into account that 164 pounds of ashes were left behind, it will be seen that 894 pounds of carbon were actually used, so that 10.92 pounds of water were evaporated for every pound of carbon, which, if the hydrogen in the coal, 0.56, be taken into account, would yield a useful effect of 82.3%

What Old Triangular Files can be Used For.

In many small shops, but more particularly in the shop of the jobbing gunsmith, where there is more or less saw filing done, there soon collects quite an amount of worn-out three square or triangular files. When worn, they are generally thrown aside as worthless but very little except for old steel, but their sphere of usefulness need not end here.

Probably one of the most curious uses to which such a file can be put is that it can be made into a very good glass cutter. Grind the three sides at the point smooth, so that the teeth are obliterated. Grind the sides flat, but shape the point curved or convex. To use it, hold the tool so that one of these sharp rounded edges will bear upon the glass, and with a little pressure draw it steadily over the glass. The result is a slight scratch or cut, and by using a little force the glass will break where this scratch is seen.

If the teeth of an old file be removed by grinding, and the taper shape be preserved, it will make a passable hand reamer. If the point be made obtuse or "stunt," it forms a convenient substitute for a hand countersink. If the tool is put in a hole that is to be enlarged it will be observed that there is an equal bearing at the three points, which gives a steady hold on the metal to be removed. Now turn the tool a little so that it will cut. Observe the position and shape of this cutting edge. To the initiated it will present about the same form as that of the cutting edge of the tool used by the machinist to cut iron in the lathe.

WELDING TUBES AND TIRES.—Krupp, the great steel worker of Germany, has recently patented a new method of welding tubes and tires, which is based upon what appears to be an excellent idea, as follows: He draws the tube over one pair of ordinary rolls, and then heats the whole length of the portion to be welded by a special contrivance, which is a portable fire box, into which air is so blown that the heat is directed against the weld. After the necessary heat is attained the rolls are set in motion, and the place to be welded is repeatedly drawn through them.

A LOCOMOTIVE working by means of compressed air has been designed by Colonel Beaumont, an English engineer, who claims that such an engine would be able to accomplish a journey of 10 miles without renewing the charge of air, and drawing two loaded carriages.

Cushioning the Reciprocating Parts of Steam Engines.

Mr. Charles E. Emery, a civil engineer of New York, in a recent discussion on the above subject, sums up the principal considerations relating thereto as follows:

The clearance spaces at each end of a steam cylinder include the clearance proper, as well as the passages and other spaces between the valve and the piston at the end of its stroke. These must evidently be filled at every stroke with steam at the maximum pressure admitted. This may be done in two ways, viz., by admission of steam directly from the boiler or by closing the exhaust passage before the end of the stroke, so that the back pressure vapor will be compressed and the clearance spaces filled with cushioned steam equal, as nearly as practicable, to the initial steam pressure in cylinder. In the first case the cost is the quantity of steam taken from the boiler to fill the clearance spaces, and in the second the quantity of steam required in that particular engine to do the work of compression, supposing the net power furnished to be the same in each case. Generally the second plan will have the advantage, for the reason that the steam required to furnish the additional power will be worked expansively. There can be no economy of steam by cushioning when there is no expansion, and the full theoretical economy due to cushioning is not attained unless the steam is expanded down to the back pressure where the compression begins, which is undesirable on account of the losses due to interior cylinder condensation during extreme expansion. Hence, in practice it rarely occurs that the energy absorbed in cushioning is entirely utilized during the return stroke. Again, cushioning is an indirect operation, so the economy resulting therefrom should be charged with a portion of the friction of the engine, since the total load is increased for the same net load. Cushioning also increases the average back pressure, which, under certain circumstances, may be a disadvantage. Moreover, in balancing advantages it should be borne in mind that, if there be no cushion, the steam in clearances taken directly from boiler would do some work in an expansive engine. All these and other conditions must be fully considered to ascertain accurately the economy of cushioning, and until some one takes the time to formulate them, the common-sense view must prevail that cushioning is in general productive of a small economy of steam; that at least it causes no loss within the limits available with ordinary valve gear, and therefore may be used to any practical extent to produce desired mechanical effects. In practice the question of economy becomes of secondary importance compared with the mechanical advantages, particularly for high-speed engines.

A CHANCE FOR INVENTORS.—The German Railroad Union, in offering prizes for the six years ending July 5, 1881, suggests the especial desirability of devising the following improvements: 1. The invention of a locomotive tender or car wheel of simple but safe design, by which the loosening of tires will be effectively prevented. 2. The invention of a simple apparatus, which can be depended upon under all circumstances, which will render it possible for train-men on different parts of a long train to communicate with the engine-man. 3. The invention of a cheap but reliable signal apparatus for the automatic blocking of trains which follow each other closely upon the open road, for regulating and rendering safe the traffic on crowded sections of the road. 4. The invention of apparatus which will make it possible for a train-man, with the ordinary form of brake, to apply the brakes simultaneously on two adjacent cars. This is required especially for freight cars.

SODA ASH IN STEAM BOILERS.—At a recent meeting of one of the English technical societies, Mr. Peter Spence, a well-known manufacturer, affirmed that no boiler on his works had been chipped for the past 15 years. This he explained on the ground that he had kept the *feed water* alkaline by the addition, from time to time, of a little carbonate of soda or soda-ash.

A SHIP RAILROAD TO BE TRIED.—M. Danhourg, a French engineer, is about to test the feasibility of transporting large vessels over land. An experimental railway is shortly to be constructed at Argenteuil, upon which it is proposed to take up from the river a 2,000-ton ship and transport it to another point upon the same stream.

AMERICAN STANDARD GAUGES.—An indication of the passage of American machine practice from an art into a science is the rise of several firms who make a speciality of standard gauges. They turn out collars and plugs ground to an exact thousandth of an inch—dimensions formerly so small as to be relegated to the physical laboratory for measure.

STILL COMING.—A silk manufacturer, of Macclesfield, England, has determined to establish silk works at Patterson, N. J., to be run with American-built machinery. He will bring over several hundred expert silk workers from England.

SCIENTIFIC PROGRESS.

Temperature of Soil During Winter.

Very careful experiments were made in the *Jardin des Plantes*, at Paris, during the past winter to detect the differences of temperature at moderate depths, beneath the surface of the soil, under different conditions. The severe winter and unusual snowfall there, greatly aided the experiments. It was ascertained that grass roots exerted a marked effect in the temperature.

A striking difference was observed between the results obtained in soil covered with grass and those obtained below a bare surface of the ground. In the former, before as well as after the snowfall, at all depths below that of 5 centimeters, the temperature never descended below 0° C. Registering 3.5° at the depth of 5 centimetere on Nov. 26th, it slowly sank to 0.18° on Dec. 14th. The presence of grass appeared to effectually protect the earth beneath it from freezing at the lowest temperatures attained in that climate. Quite different results, however, were yielded in the absence of grass. In this case, at a depth of 5 centimeters, the thermometer sank below zero on Nov. 27th. Two days later it registered —2.6°. On Dec. 3d, just before the snowfall, it reached its minimum of —3.17°. After being covered with snow it registered —0.8°, and later —1.4°. The snow here appears to act in a certain measure as a screen against changes in temperature, but its conductive properties are still too marked to prevent these changes from being felt sensibly at a certain depth in the earth. In the case of the agriculturist, this slow conduction, when united to the still slower conductive properties of a tolerably thick layer of dead shoots of cereal crops sown in autumn, may frequently insure immunity from freezing to the roots below the surface.

VESBIUM, AN ALLEGED NEW ELEMENT.—In the *Chemical News* we find an abstract of a paper read before the Neapolitan Academy of Sciences, by Signor A Scacchi, on the composition of certain green and yellow incrustations which appear in certain fissures in the Vesuvian lavas of the year 1631. These incrustations consist of silicates containing copper, lead, and a body which he considers to be new, and which he proposes to call "Vesbium," from the ancient name of Vesuvius. The small quantities of this substance have permitted only a preliminary examination. It appears, however, to be a metallic acid of a red color, giving colorless alkaline salts, which turn yellow on the addition of an acid. The silver salt is red or orange; the copper salt a yellowish green. Sulphureted hydrogen gives a brown precipitate, and a blue liquid which is rendered brown by zinc. Before the blow-pipe it communicates to microcosmic salt a yellow color in the outer flame, and a green in the inner. The author does not believe in the presence of molybdenium or vanadium, though the presence of the latter seems to be indicated. Further investigation will be required to determine the genuineness of this alleged discovery.

SALICYLIC ACID AS A FRUIT PRESERVATIVE.—The British *Magazine of Pharmacy*, mourning over the bruised condition to which careless packing reduces many of the "magnificent apples that are imported from America to find their places on the dessert-table in England," and which necessitates their speedy consumption to avoid rotting, makes the suggestion that the effects of any rough handling in shipping will be harmless, if the fruit is carefully wrapped in paper previously saturated with a strong solution of salicylic acid, and dried.

RECIPES FOR THE HECTOGRAPH.—The convenient gelantine copying plate that has lately come into very general use may be made, according to Paris *La Nature*, after either of the following recipes, namely: gelatine (white glue), 100 parts; water, 379; glycerine, 375, kaolin, 50. Or, gelantine, 100; dextrine, 100; glycerine, 1,000; sulphate of barium, *ad lib.* Or, gelantine, 100; glycerine, 1,200; sulphate of barium paste, washed by decantation, 500 cubic centimeters. Or, gelantine, 1; glycerine, 4; water, 2.

NEW METHOD OF REFINING IRON.—It is reported that Mr. Krupp, of Essen fame, has obtained a patent for refining pig by means of iron oxide. The action takes place in a cupola lined with basic bricks in graphite. By this method, it is claimed, the greater part of the silicon, sulphur and phosphorus are removed, without at all interfering with the carbon.

RAPID GROWTH OF FUNGI.—A Norwich botanist amazed the other day at the rapid growth of a fungus, calculated that it had developed 10,000,000 cells in one day, or 116 cells a second. Prof. Gray, however, cites an instance where a century plant formed 2,000,000,000 cells in 24 hours, or 231,481 a second.

VALENTINITE.—The mineral valentinite, Sb_2O_3, hitherto unreported from the United States, occurs on antimonial ore at the Bagdad mine, Tempiute, Nevada, in radiated tufts of white fibers four m. m. in length.

THE Society of Natural History, at San Deigo, is doing good work in the direction of original research in that section of the State. Among other matters of scientific interest brought before it at its last meeting, May 7th, Miss Rosa Smith made a communication descriptive of a species of fish—a scaly Blenny—which she had caught in the tide pool near La Hoya, and which has been found to be new to science. All of the specimens had been sent to the United States National Museum at Washington. The fish is a small one measuring two and one-eighth inches in total length, and belongs to the genus *Cremnobates*. The specimens agree in some particular with the *Cremnobates monophthalmus*, a species taken on the Pacific coast of Central America, and described by Gunther, but somewhat more closely with Steindachner's description of *C. affinis*, a species considered by him as doubtfully distinct from *C. Monophthalmus*, Prof. Jordan considering the characteristics of this fish especially distinct from any hitherto known, has given it the name of *Cremnobates corallinæ*. Miss S. would have chosen the specific name "*integripinnis*," meaning entire fin, which would have been descriptive of the main character which distinguishes the San Diegan specimen from these already described.

CROOKES' VACUUM.—In his experiments upon radiant matter, Crookes required a vacuum of a millionth of an atmosphere. It was obtained by a combination of Geissler's and Sprengel's mercurial exhausters, and measured by McLeod's gauge. Warren de la Rue estimates that the gauge will correctly record a vacuum of one fifteen-millionth of an atmosphere. Precipitated sulphur was used by Crookes in order to absorb the mercurial vapors; metallic copper, reduced from its oxide, to absorb the sulphurous vapors, and sulphuric anhydride to absorb the vapor of water. A small radiometer was employed to show the progress of the vacuum, and a Plucker tube for a similar purpose, the spectrum of the electric spark changing with the degree of rarefaction.—*Ann. de Chim. et de Phys.*

NAGYAGITE.—In his pamphlet on "The Mineral Resources of North Carolina," Dr. F. A. Genth records the occurrence of nagyagite, a telluride of lead with nine to ten per cent. of gold, at King's mountain, N. C. An examination of the tellurium mineral in some specimens of the ore from there, recently donated to the Geological Cabinet, by Arthur Macy, E. M., superintendent of the King's Mountain mining company, shows that it contains no gold, and is therefore altaite, the simple lead telluride. The ore consists of free gold, with small amounts of argentiferous galena and blende, with this altaite and iron pyrites, the vein filling being of silicious limestone.

SULPHUROUS ACID.—The *British Medical Journal* reports the publication, by Prof. Gamgee, of a new and convenient mode of using sulphurous acid, the disinfecting qualities of which are universally known. Cold alcohol, the Professor asserts, will dissolve 300 times its own volume of the gas; and a fluid possessing such powers of concentration cannot but be as efficient as it is portable and convenient. A few drops of the sulphureted alcohol in the bottom of a trunk will disinfect any clothing that may be put into it; and fungous germs, such as must in casks, etc., may be destroyed by the use of a very small quantity.

CONCERNING ANOTHER ALLEGED NEW ELEMENT.—Norwegium found in the red nickel pyrites of krageroe. Dahll has communicated some additional facts. He finds it white, not very ductile, specific gravity 9.44, melts at 350°, and dissolves in nitric acid with a blue color, which becomes green on dilution. The solutions are precipitated green by alkalies, but the precipitate is dissolved in excess with blue color. Sulphureted hydrogen gives a permanent brown precipitate. Before the blow-pipe it gives yellow glasses, which become blue on cooling, and on charcoal with soda it forms a yellowish-green coating.

SUPERNUMERARY RAINBOWS.—When a rainbow is very brilliant secondary or supplemental rainbows are often seen near the center of the arch. Observers have generally supposed that the reduplication is never visible near the ends of the arch; but Montigny, according to a recent publication of the Academy of Belgium, saw on August last two ordinary bows with four supernumerary arches, reaching near the ground. In this case these were evidently two distinct layers of rain clouds, and the supplementary bows seemed to be formed in the lower layer.

A SOLVENT FOR CARBON.—In one of the last numbers of *Nature* we are informed that Dr. Sidney Marsden has discovered a substance in which carbon is soluble, and from which part crystallizes out in the graphitic form, the rest in the adamantine form. The crystals of the latter variety are said to be octohedra (visible, however, only by the microscope), and possess sufficient hardness to scratch sapphire.

FRENCH APPRECIATION.—The appreciation of the French for the cultivation of science in other countries is shown best perhaps by the following classification of the *foreign associates and correspondents* of the Academy, namely: Great Britain, 21; Germany, 17; United States, 8; Russia, 6; Switzerland, 6; Scandinavian countries, 5; Italy, 4; Belgium and Holland, 4; Austria, 2, and Brazil, 1.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 6.		Week Ending May 13.		Week Ending May 20.		Week Ending May 27.	
Alpha	6⅜	6	5⅜	5	7	5	6	5½
Alta	2.35	1.95	2.30	1⅜	3.05	2	2.60	2¼
Andes	95c	80c	75c	60c	1.10	80c	95c	75c
Alps	....	....	....	....	....	....	....	....
Argenta	35c	20c	25c	15c	25c	20c	20c	....
Atlantic	10c	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	2.55	1.70	2.80	2	3.60	2.85	3.15	2.60
Belmont	35c	....	....	....	55c	25c	40c	....
Best & Belcher	9⅜	8	8¾	....	14⅜	8¾	11⅜	9¼
Bullion	3¼	3.05	2.85	2.40	3¼	2.95	3¼	2.80
Bechtel	1.60	1¼	1.80	1¼	1¾	1.70	1⅝	1.30
Belle Isle	60c	50c	50c	45c	50c	45c	50c	45c
Bodie	8	7⅛	7⅞	6	7⅞	7⅛	8.60	7¼
Benton	1.45	1.05	1¼	1	1.95	1.40	1.70	1⅛
Bulwer	5¼	5	7	5⅜	6⅜	6	6	5⅜
Boyle	....	....	....	....	....	....	....	....
Black Hawk	80c	70c	75c	50c	75c	60c	65c	....
Belvidere	2⅜	2⅛	2⅜	2⅛	2⅞	2.45	2⅜	2.40
Booker	50c	35c	40c	30c	40c	35c	40c	35c
Caledonia	70c	30c	35c	25c	70c	40c	60c	40c
California	2⅜	2.10	2.20	2	2.30	2.10	2.30	2.10
Challenge	1.60	1⅛	1.40	80c	1.80	1.30	1.55	1⅛
Chollar	4.35	3.95	3.60	3.05	4⅛	3.60	3.80	3¼
Confidence	6	5⅛	5¼	4	7⅛	4⅜	6	5⅜
Con Imperial	40c	30c	35c	30c	45c	35c	45c	30c
Con Virginia	3.45	3	3.05	2⅜	3⅜	3	3.15	3
Crown Point	2	1.70	1⅞	1⅛	2.30	1⅞	1.90	1⅛
Con Washoe	....	....	....	....	....	....	....	....
Champion	95c	80c	80c	70c	75c	60c	75c	60c
Concordia	1	90c	1	85c	80c	70c	60c	75c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	25c	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	60c	55c	55c	50c	55c	45c	85c	70c
Eureka Con	20	19⅛	19⅛	18⅜	19	18⅜	18	17⅛
Exchequer	2.55	2	1.95	1⅛	2⅜	1.95	2¼	2
Endowment	25c	....	....	....	15c	....	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	70c	60c	70c	50c	1.10	85c	1.10	70c
Gila	....	....	....	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodsbaw	55c	20c	70c	55c	95c	60c	75c	65c
Gould & Curry	4⅛	3.85	3.80	3.20	5¼	3¾	4.35	3.80
Hale & Norcross	4.35	3.30	3¼	2.60	5⅜	3.10	4.60	3.60
Hillside	35c	25c	25c	....	75c	....	....	....
Higbbridge	....	....	....	....	....	....	....	....
Homestaka	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	50c	30c	30c	....	25c	....	40c	40c
Julia	1	75c	75c	55c	90c	70c	70c	55c
Justice	1⅛	1	90c	75c	1.30	90c	1.15	75c
Jackson	3¼	....	3⅛	3	3	....	2⅛	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	4⅛	....	....	....
Kentuck	2.60	2⅛	2¼	1⅞	....	....	2	....
Kossuth	....	....	10c	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	....	....	15c	....	....	....	....	....
Lady Wash	45c	35c	40c	30c	60c	35c	40c	....
Leopard	5c	....	....	....	....	....	....	....
Leviathan	30c	25c	30c	....	30c	25c	25c	20c
Leeds	....	....	....	....	....	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	20c	20c	10c	25c	20c	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	1	....	90c	....
Martin White	85c	....	85c	....	60c	....	....	....
McClinton	45c	35c	40c	35c	55c	35c	50c	40c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	8⅛	6¾	7¼	5⅞	11⅛	8⅛	8⅜	7
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	15c	10c	35c	25c	55c	45c	60c	50c
Northern Bella	11	8⅛	11	9⅛	11⅞	8⅛	11¼	10⅛
New Con	....	....	....	....	....	....	....	....
Navajo	45c	25c	30c	25c	25	....	20c	....
Occidental	1⅛	1.10	90c	55c	2	1.20	1⅜	1.30
Ophir	6⅞	6⅜	8⅛	6	11⅞	8⅛	10⅛	8¼
Oriental	....	....	....	....	....	....	....	....
Overman	1.20	80c	1⅛	1.05	2⅛	1⅛	2¼	1.60
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	15c	....	5c	....	....	....	....	....
Potosi	3.40	2.05	2.80	2.20	3⅛	2¼	3	2¼
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	20c	5c	30c	25c	30c	25c	25c	....
Richer	10c	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	50c	....	....	....	....	....
Savage	3.60	2.45	3.40	3	5	3.15	4.05	3.30
Seg Belcher	7⅞	....	9	6⅜	11	8	8	....
Sierra Nevada	11⅜	9⅛	10⅜	8	18	10⅛	15⅜	12⅛
Silver Hill	40c	25c	25c	10c	1	15c	80c	60c
Silver King	5	4⅜	4⅞	....	4.10	4	5	4⅛
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	1.10	1	1.30	1.05	2	1.40	1.80	1⅛
Scorpion	1⅛	1.10	1.15	85c	1.80	1.15	1.65	1.10
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	25c	20c	35c	20c	30c	20c	30c	25c
South Standard	....	....	....	....	....	....	....	....
Star	30c	25c	30c	....	30c	25c	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1⅛	1	1⅛	....	1¼	1.10	1¼	1
Tioga Con	2.05	1.80	1⅞	1.55	1.95	1¾	1¾	....
Tiptop	5⅛	5	6⅜	....	5⅞	6⅛	6½	5⅜
Trojan	....	....	10c	....	5c	....	....	....
Union Con	21	17⅞	18⅛	14⅜	23⅛	18	19	16⅜
Utah	8	6⅛	6¼	5	14	7	10	8⅛
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.85	1⅛	1.30	1.05	1.40	....	1.70	1⅛
Walls-Fargo	....	....	5c	....	....	....	....	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	6	5⅜	5⅛	4.10	7⅜	5	6⅜	5⅛

Sales at S. F. Stock Exchange.

Thursday A.M., May 27.

20	Alpha	1400	Argenta 20c
500	Alta 2½@2.60	425	Addenda 1¼
500	Andes 80@75c	100	Belding 40c
670	Belcher 3.10@3.15	340	Bechtel 1.35@1¼
435	B & Belcher 10⅝@10⅜	300	Bodie 8⅛@8⅜
335	Bullion 3	300	Belvidere 2⅜
50	Benton 1.40	200	Boston 1¼
170	Crown Point 1⅞	50	Black Hawk 70c
440	California 2.10	50	Bulwer 5⅝@5⅞
100	Chollar 3⅜	400	Champion 70c
500	Con Virginia 3.10@3.15	200	Day 80c
110	Caledonia 40c	400	D Standard 40c
30	Excbequer 2.05	25	Eureka Con 17⅛
70	Hale & Nor 4.10	550	E Mt Diablo 50c
210	Justice 80@75c	590	Goodsbaw 70@75c
70	Julia 60c	90	Grand Prize 90c
140	Mexican 8⅛	200	Hillside 75c
100	Mackey 10c	125	Independence 50@55c
100	Mountain View 1.05	100	Jupiter 1.30@1¼
350	N Bonanza 25c	100	K K Con 4¼
350	New York 50@55c	210	Mt Potosi 75c
170	Occidental 1.30@1.40	100	McClinton 45c
300	Ophir 9½@9⅜	500	May Belle 20c
290	Overman 2.10	105	Mammoth 2.20
110	Potosi 2.70	25	N Noonday 5½
350	Quinn 1¼	105	Navajo 20c
670	Silver Hill 75c	25	Northern Belle 10⅛
360	Scorpion 1.60@1.55	250	Orient 20c
100	Savage 3⅛	50	Oro 2.90
235	Sierra Nevada 13@13⅜	200	Queen Bee 35c
75	Union 17⅜@18	115	Raymond & Ely 20c
90	Utah 9	500	Summit 1.30@1.90
150	Ward 1⅛	595	S Bulwer 1.40@1.35
490	Yellow Jacket 5⅛@5⅜	20	Silver King 5
	AFTERNOON SESSION.	140	Syndicate 1
250	Alhion 40c	500	South Bodie 20c
		100	Tuscarora 20c
		100	University 35c

THE annual election of the Pacific Mail will take place May 26th. It is believed that Jay Gould and his railroad friends will obtain the control.

MINING STOCKHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	12	1 00	May 12	June 16	July 7	W Willis	309 Montgomery st
Alta S M Co	Nevada	17	50	Apr 5	May 10	May 31	W H Watson	302 Montgomery st
Argenta M Co	Nevsda	5	25	Apr 28	June 2	June 22	E M Hall	327 Pine st
Belcher S M Co	Nevada	22	75	Apr 2	May 6	May 27	J Crockett	203 Bush st
Benton Con M Co	Nevada	3	50	Apr 2	May 7	May 25	W H Watson	302 Montgomery st
Booker Con M Co	California	5	20	May 10	June 15	July 7	W H Leut	309 Montgomery st
Caledonia M Co	Nevada	31	50	May 4	June 8	June 28	R Wegener	414 Califonia st
Con Imperial M Co	Nevsda	11	10	May 5	June 8	June 28	W E Dean	203 Bush st
Crown Point M Co	Nevada	41	50	May 8	June 11	July 2	J Newlands	203 Bush st
Dudley M Co	California	8	25	Apr 20	May 24	June 22	E C Masten	309 Montgomery st
Equitable T & M Co	Utah	22	10	Mar 22	Apr 30	May 25	C J Collins	227 Montgomery st
Gila S M Co	Nevada	7	25	Apr 20	May 24	June 14	W W Parrish	330 Pine st
Hale & Norcross	Nevada	64	50	May 11	June 16	July 8	J F Lightener	309 Montgomery st
Independence M Co	Nevsda	6	25	Apr 19	May 25	June 14	E M Hall	327 Pine st
Julia Con M Co	Nevada	12	40	May 12	June 16	July 6	H A Charles	419 California st
Justice M Co	Nevada	32	50	May 22	June 26	July 19	R E Kelly	419 California st
Jupiter M Co	California	8	40	Mar 31	May 4	June 2	E C Masten	309 Montgomery st
Leopard M Co	Nevada	13	10	Apr 5	May 7	May 28	E M Hall	327 Pine st
Mexican G & S M Co	Nevada	11	1 00	Apr 28	June 1	June 21	C L McCoy	203 Bush st
Mackey G & S M Co	Nevada	3	10	Apr 25	June 1	June 21	J M Buffington	309 California st
Modoc Con M Co	——	9	1 50	Mar 18	Apr 26	May 17	J W Pew	310 Pine st
Monte Christo Con M Co	California	3	10	Mar 19	May 8	June 3	B Barris	309 Montgomery st
North Bonanza M Co	Nevada	5	25	Mar 20	Apr 24	May 25	W W Stetson	309 Montgomery st
Ophir S M Co	Nevada	35	1 00	Apr 10	May 13	June 3	C L McCoy	203 Bush st
Overman S M Co	Nevada	45	50	Apr 6	May 12	June 2	G D Edwards	414 California st
Raymond & Ely M Co	Nevada	14	25	Apr 5	May 10	June 7	W L Elliott	328 Montgomery st
Red Cloud Con M Co	California	7	20	May 11	June 17	July 9	W J Taylor	310 Pine st
Savage M Co	Nevada	42	1 00	Mar 6	Apr 3	May 26	——	309 Montgomery st
Sierra Nevada	Nevada	63	1 00	April 30	June 4	June 21	D L Parker	309 Montgomery st
Silver Hill M Co	Nevada	10	50	April 14	May 19	June 9	W E Dean	203 Bush st
Scorpion M Co	Nevada	7	40	Apr 26	June 7	June 30	Geo R Spiuucy	310 Pine st
Solid Silver G & S M Co	Nevada	3	25	Apr 13	May 15	June 5	R Hewson	320 Sansome st
South Bodie G M Co	California	3	15	Apr 8	May 12	June 2	H Deas	309 Montgomery st
South Bulwer G M Co	California	2	50	Apr 2	May 5	May 27	W Stuart	320 Sansome st
South Standard M Co	California	6	20	April 29	June 3	June 23	C A Sankey	331 Montgomery st
Utah S M Co	Nevada	30	2 00	Apr 28	June 2	June 22	G C Pratt	309 Montgomery st
Yellow Jacket M Co	Nevada	37	1 00	May 5	June 5	July 7	M Otey	203 Bush st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Atlas M Co	Utah	1	20	May 19	June 23	July 14	A F McGrew	420 Montgomery st
Black Rock M Co	California	3	15	Apr 2	May 21	June 21	N T Root	225 Beale st
Defiance G M Co	California	5	25	May 20	June 28	July 21	W H Lent	309 Montgomery st
East Mt. Diablo M Co	Nevada	1	10	May 7	June 14	July 6	G W Fisher	324 Pine st
Hintracht G M Co	California	3	1 00	Apr 13	May 15	June 1	H King	320 Sansome st
Excelsior Deep Gravel M Cn	California	10	10	Apr 21	May 24	June 15	D F Verdenal	327 Pine st
Fairfax M Co	Nevada	2	20	Apr 7	May 26	June 16	O C Miller	324 Pine st
Gover M & M Co	California	42	20	May 5	June 21	July 14	W O Wilson	402 Front st
Hillside M & M Co	Nevada	3	30	Apr 9	May 12	June 7	F Frankeutbal	330 Pine st
Morgan M Co	California	6	53	May 14	June 21	July 15	J J Rapbael	533 Kearny st
Mt Potosi Con M Co	Nevada	3	2 50	May 11	June 14	July 6	E A Holmes	316 Pine st
Murcbie G & S Co	California	3	25	Apr 20	May 21	June 21	S D Rodgers	328 Montgomery st
Northern King M & M Co	Arizona	4	20	May 14	June 19	July 12	E A Holmes	310 Pine st
Oro Blanco M Co	Arizona	1	20	May 3	June 7	June 23	W O Gould	220 Sansome st
Vanderbilt M & M Co	Nevada	1	15	Apr 12	May 20	June 16	J Morizio	328 Montgomery st
Wyoming Coal M Co	Wyoming	2	3	April 21	June 10	July 10	——	
Wyomiug & Dakota W Co	Dakota	2	1 00	May 6	June 16	June 30	T Widman	404 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alpha Con M Co	Nevada	Wm Willis	309 Montgomery st	Annual	June 21
Bodie Con M Co	California	Wm H Lent	309 Montgomery st	Annual	June 7
Equator M Co	Nevada	Wm Willis	309 Montgomery st	Annual	June 7
Excelsior Deep Gravel M Co	California	H Plagemau	327 Pine st	Annual	June 1
Foulk G & S M Co	Nevada	A W Rose	302 Montgomery st	Annual	June 1
Florida Hill M Co	Idsho	R Wegener	414 California st	Annual	May 23
Gopher Con G M Co	——	T Widmann	404 Montgomery st	Annual	May 25
Haskin M Co	Nevada	O H Jewell	5½ Kearny st	Annual	May 24
Lady Franklin G & S M Co	Nevada	F E Luty	330 Pine st	Annual	June 7
Pioneer Con M Co	Nevada	J M Buffington	309 California st	Annual	May 24
San Carlos Coal M Co	——	A J Kopsch	230 Montgomery st	Annual	May 25
Silver Hill M Co	Nevada	W E Dean	309 Montgomery st	Annual	May 31
Tybo Con M Co	Nevada	W M Parrish	330 Pine st	Annual	June 2
West Side S M Co	California	W M Parrish	330 Pine st	Annual	June 1

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	E M Hall	327 Pine st	20	Feb 26
Black Bear Q M Co	California	W L Oliver	Safe Deposit Bldg	25	May 16
Bodie Con M Co	California	W H Lent	Nevada Block	25	Mar 1
Cherokee Flat Blue Grav M Co	Cal	R N Van Brunt	318 Pine st	4 25	Mar 13
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	May 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	50	Apr 24
Gross Westeru Q M Co	California	A Halsey	312 Montgomery st	25	Feb 3
Idaho G M Co	California	C Meade	324 Pine st	2 00	Apr 9
Natoma Water & M Co	California	——	——	2 00	Apr 5
New York Hill G M Co	——	J B Leigbton	527 Clay st	25	Feb 20
Northern Bell M Co	Nevada	W Willis	309 Montgomery st	50	May 15
Ontario M Co	Utah	——	——	50	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 24
Seventy-six S M Co	Nevada	E F Stone	306 Pine st	03	May 24

The Mining Share Market.

The transactions in the mining share market during the week compare most unfavorably with those of the previous week. The dullness has been general and unrelieved by any noteworthy incident. There was "nothing stirring but stagnation." There has not been a week during the prolonged dullness of the market, in which the daily sales were so light. The Comstocks were not in demand, and the calls for outside shares were few and far between. And yet it is noticeable that the tone of dealers is not despondent; for the least ripple brings them to the surface full of life and readiness to take the offered prize. It is idle to speculate on the causes which depress the market at present, for no man can add to his knowledge of the "way" of the stock market by taking thought. Let him be patient, and wait and hope.

The dullness of the mining share market offers a marked contrast to the renewed and general activity at the mines. The Comstock has never been in such splendid condition for the development of ore bodies and for systematic and economical work. Almost the same may be said of the principal ontside districts—notahly Eureka, Bodie and Candelaria. In nearly all the mining counties in this State, in several of which mining had heen long neglected, the activity partakes of a vcritable "hoom" and the output of the precious metals promises to be large. These facts ought to, and they douhtless will, shortly rehahilitate the share market.

IN the estimation of the miners of Butte, Montana, Yo-go and No-go are synonymous terms, to be applied to the newly discovered mines away off east, t'other side of anywhere. At least that is what the Butte *Miner* tells us ahout it.

PLACER mining operations are quite active in the vicinity of Silver Bow, Montana, and at Rocker a large numher of Chinamen are working ground.

Bullion Shipments.*

Since our last issne, we have noticed the following hullion shipments:

Northern Belle, May 17, $8,400, May 23, $10,588; Paradise Co., May 24, $1,500; Bodie Con., May 25, $8,000; Gold Hill (Quartzhurg, I. T.), May 20, $3,100; Richmond, May 26, $17,748, valne of hars; Contention, May 15, har No. 100, a total of $206,000 since March 8; Hillside, May 25, $3,100.

*Desiring to make our list of Bullion Shipments as complete as possible, we will ba thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

THE WAUGAMANN DRY WASHER.—This new dry washing machine is now on exhihition at No. 2 Sumner street, off Montgomery, in the hasement. It is owned by Waugamann & Barber, who will take pleasure in exhihiting its workings to those interested in this class of machines. Several of these machines are now in Arizona, and good reports are received from them. A manufactory is to he started in this city shortly; hut at present there are a numher on hand ready for sale. It is intended for dry placer mining particularly, hut may he used for concentrating tailings, etc. The machine is intended to he run hy hand, and is of a portahle character. We shall shortly describe and illustrate this machiue, when we will give more particulars.

CITY HALL ARTESIAN WELL.—The tests made on the City Hall artesian well, to determine the quantity of water it is capable of supplying, show the following results for eight days, commencing on May 8th, together with the nnmher of hours of pumping each day: Six and a half hours pumping brought 47,760 gallons to the surface; six and a quarter hours, 45,000 gallons; eight hours, 49,200 gallons; eight and a half hours, 52,104 gallons; eight and a half hours, 64,560 gallons; nine hours, 68,160 gallons, and nine hours on the last day, 66,960 gallons

MINING SUMMARY.

The following is mostly condensed from journals publisbed in the interinr, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

GOVER.—Amador City *Dispatch*, May 22: The Gover mill is only kept running part of the time, owing to the scarcity of rock. The ore that is being crushed, bowever, is of a very fine quality.

THE Yellow Jacket, at Drytown, bad ite first clean-up last Tuesday or Wednesday, and the yield was very satisfactory to the owners.

THE Little Amador mine is still closed down, and it is not yet known when it will start up again.

TEAMSTERS have again commenced hauling timbers, lagging and wood to the Bunker Hill mine, whicb had entirely exhausted the supply ou hand.

VOLCANO ITEMS.—*Ledger*, May 22: Our town has been full of quartz men the past few days. Strikes and rumors of strikes ou every hand. James M. Hannaford, of the Downs mine, with the Hon. Mr. Downs himself, are here at the present writing, rumor says, looking out the site of a mill. Two air compressors have been received by the Volcano gold gravel mining company, and are being put in place. The Stewart & Gillick has been sold to Mr. Lyle, formerly of tha firm of Jennings & Brewster, of San Francieco. We are not posted on the price, but tha sale comprises mill and mine.

PLYMOUTH NOTES.—Amador City *Sentinel*, May 20: Ground has been broken for the shaft of the Pacific company, east of the Empire. Extensive works will be erected upon this claim. Wa understand that Mr. Hayward is the owner of the greater portion of the stock of tbo Pacific.

BUTTE

NEW MINING BOAT.—*Mercury*, May 21: C. R. Clark, of San Francisco, bas been in Oroville for a week or so back looking for a location for a mining boat. He represents the Roy Stone hydraulic mining and dredging company, of Hartford, Connecticut. James C. Gray made a proposition to the gentleman which he regarded in a favorable light, and we apprehend that the new enterprise will shortly ba set in operation. This boat is claimed to ba entirely different from any yet introduced on this coast.

CALAVERAS.

MINING ITEMS.—Calaveras *Chroniele*, May 22: We learn that the mill on tha Livermore mina, Whisky Slide district, is being repaired, and that active oncrations are soon to be renawed in tbe mine itself. There is a genuine quartz boom in progress in this county, suro. Work is being resumed in mines that have laid idla for indefinite periode, and new developments are constantly being made. Dave Lampson le running a tunnal undar the old Pacific Slide, or near it, in Rich gulch. He says that prospects are encouraging. Tha ground is getting a little softer, and the gravel begins to show gold.

GWIN MINE.—We are pleased to be able to record very encouraging intelligence from the Gwin mine—news of no less importance than that pay ore has been etruck in the 600 leval, south. Our information is that the ledge is wide and the rock rich. A large amount of a fair quality of ore has been taken from the 500 level, eouth, and nnw tha striking of the cbute in the 600 level is very strong evidenca of a great ore body south of the old workings.

EL DORADO.

GRIFFITH CON.—*Republican*, May 20: Rock is now being taken from tha Griffith Con., near Diamond Springs. There ie a large body of ore in sight. A drift is now being run at a deptb of 40 ft, and as soon as tbe volume of water is lessened, sinking will be continued.

GREENWOOD MINES.—Mr. Leavitt tells us that his company will commence on tha Pilot Hill mines during this week, and that they intend giving them a good trial. Also that they intend putting up sulpburet works here forthwith, to enable the miners to test the value of their sulphurets in both quartz and seam diggings in this neighborhood.

THE Kelsey gold and silver mine is shut down for nonpayment. No blame can bo attacbed to Superintendent Hodga. The capitalists below have an idea that tbe poor miners require no pay for their work.

Now that tha weather bas become settled and tha roads good, there is a freshly-awakened interest in our mining industries that bids fair to make things exceedingly lively in a month or two.

INYO.

MINING ITEMS.—*Independent*, May 15: The developments of the winter in tha old Black Warrior gold mine, in the mountains to the west of Big Pine, have been of unusual importance. The district will boom ahead during the summer, as the plentitude of water will allow more extensiva workings of the rich placer claims. Mr. Wm. Crapo has had a good force at work on tbe Crapo property —the old Buena Vieta ledge at Cerro Gordo—drifting into its immensa croppings preparatory to sinking. The outcrop is visible as far as Buena Vista mountain can be seen, and consists of an ore body 300 ft in length and from 30 to 50 ft wide, sampling $102 per ton in silver and gold. It would require years for a 20-stamp mill to make a respectable hole in this bonanza.

IN FULL BLAST.—Inyo *Independent*, May 22: It is pleasant once more to note that two of the Darwin furnaces are once more in full blast, and both running beautifully. These are tha Defiance, under Supt. John Gorman and foreman Martin Mee, and the New Coso, we presume under Supt. J. J. Williams. The Custer has produced about 10 tons of bullion every 24 hours. The New Coso commenced running on the same date, and is making a splendid run. The town is quite lively, and will continue so for tho balance of the month.

MONO.

NORTH FORK DISTRICT.—Mammoth City *Herald*, May 15: Tom Agnew, who has just returned from this district, informs us that the mines in that locality on which work has been prosecuted during the past wintar ara all looking remarkably well. Most of the work which has been done is tunneling. In several of these tunnels ledges of good mineral-bearing quartz have been encountered, but in no case have the main ore bodies been struck. It is confidently expected that a great amount of work will be done this season. Two men have gone out to the settlement in the western valley in order to bring in a supply train as soon as possible. The isolated inhabitants have all enjoyed good health, and having laid in a sufficiency of the necessaries of lifa before the snow fell, have not suffered. Mr. Agnew, John Kehoe and others will soon go over and commence operations on their mines.

BODIE MINE.—*News*, May 23: No mine in Bodie district attracts as much attention from the mining public as the Bodie. Ore bodies of nearly pura gold have been opened and extracted. The stock has fluctuated from $30 to $2, $4, $6 and $7, caused by working out ore bodies in sight, and having no reserves—and not, as many suppose, from the mine being worked out. To-day, tha Bodie stands second only to the Standard. Tha works of the Bodie are well arranged for working the mine in a most effectual and economical manuer. The blacksmith ebop is large and roomy, and fitted up with every convenience for good work. The hoisting engine is a 50-horse locomotive, that does tha work of hoisting with ease. The air compressor engina is a 60-borse power—steam cylinder, 14 inches in diametar, 32 stroke. The compressor is 12-inch, Scott, Prescott & Co. makers. It furnishes air to run the pump and hoisting engine on the lower levels.

NOONDAY.—The incline from the 512 level is now down 10 ft. Tha watar bas retarded progress of the work somewhat. In the nortb drift, vein No. 2, same level, has been advanced 19 ft, and south drift, same vein and level, 10 ft during tbe past week. The excavation for machinery on the 512 level is being made with all possibla dispatch. The station preparatory to crossouting from the 512 level is about completed. On the 412 level the north drift on vein No. 1 was advanced during the week 13 ft; the south

drift 4 ft. Are now crosscutting the vein at that end of the south drift. The vein is somewbat broken. The crosscut is in 15 ft and the footwall not yet reached. Work on vein No. 1, 412 level, has been suspended, and the force transferred to the incline, 510 level. Stopes No. 2, north drift, 312 level, are looking well. The east crosscut from south end of main south drift, 312 level, has been advanced 12 ft. This will shortly cut a vein cut 100 and 300 ft north, finding good ore in both places. The No. 2 vein, 362 level, is now connected with the 212 level by an upraise. The south stopes of the 212 level are looking well.

ADDENDA.—Work in this mine is making the usual good progress. The shaft is now down to the 500 level and a station set is being put in place at this point. The shaft will be continued 20 ft further in depth, and used for a sump. This will be completed by next Saturday, when a crosscut from the 500 level will be started to cut the Addenda ledge. From the pitch of the ledge in the winze of the old works, 460 level, this crosscut cannot have more than 20 ft to run to intersect it, when the work of drifting on the ledge, upraising to the winze of the old works and preparing for the extraction of ore will be pressed forward with all the vigor for which the management is noted. The prospects of the Addenda are brilliant, and when fully prepared to work their ores, another dividend-paying mine will be added to the Bodie list.

UNIVERSITY.—The shaft is now down 32 ft below the 510 level in a vein porphyry formation, strongly impregnated with sulphurets of iron and carrying bunches and seams of good ore. The west crosscut is now in a distance of 65 ft from the shaft, the formation being of a most favorable mineral-bearing character. There is a slight seepage of water, indicative of the near approach to the ledge. The west crosscut is now in 50 ft. The rock is hard, but works well, and seams of clay and quartz are continually coming in. The formation is of iron-stained porphyry. The skip has been altered to a cage and another deck is soon to be added, making it a double deck cage, which will facilitate both the extraction of ore and debris. The machinery is all in good order and perfect system prevails.

MONO.—Work at the Mono is making good progress, and notwithstanding the heavy flow of water the pumps handle it with ease. The north drift from the east crosscut, 600 level, is now in 25 ft. This drift will be run to the boundary line between the Mono and Bodie, where a joint crosscut will be driven to the east line of their ground to thoroughly prospect it at this point. At the surface everything is in perfect working order. The Box furnace is giving perfect satisfaction, saving from 8 to 10 cords of wood per day. Formerly from 20 to 24 cords of wood per day were used, while at the present time from 12 to 14 cords are consumed.

TIOGA.—During the week we have added 14 ft to the length of north lateral drift No. 1, 800 level, making its total length 24 ft. The upraise on the vein from this drift is now 12 ft in height, with the vein in the top looking well. West crosscut, same level, was advanced 13 ft. Assays had from the quartz and porphyry passed through during the week range from $15 to $125 per ton; the average being about 4-5 gold and 4-5 silver. Have timbered 47 ft of the Syndicate tunnel during the week, and expect to finish the drain and the timbering of this drift within the coming week.

BOOKER.—Under the efficient management of Col. Ellsworth, the work of development in this mine is making fine progress. The east crosscut, 500 level, is now in 75 ft. The rock works well. There is now a steady flow of water, but it has decreased very materially since pumping recommenced. The pumps handle it easily, working six strokes per minute. At the surface everything is in perfect working order. There is scarcely a jar perceptible in working the pumping engine.

BODIE BLUFF.—The north drift, 200 level, has been advanced 18 ft the past week. The ledge is continually improving as advance is made, and is now compact and solid and increases daily in width. The ore is bright and lively, giving good assays. The south drift, same level, is now in 18 ft. The ledge looks about the same as in the north drift. The ground in both drifts works well. At the surface everything is in good order, indicating fine management.

SOUTH BODIE.—Work in the east crosscut, 500 level, is making fair progress, considering the character of the ground. The rock is very hard and breaks short, otherwise the mineral-bearing indications remain unchanged. There is a slight seepage of water in the face of this crosscut. They are working 3 8-hour shifts and pressing developments as rapidly as possible. At the surface the machinery is in good order and works well.

GOODSHAW.—Work on the Goodshaw is being pressed with all possible vigor. The east crosscut, 600 level, has been advanced during the week 20 ft; total length, 122 ft. The formation is of the most favorable mineral-bearing character. The west crosscut, same level, has been advanced 7 ft. The rock is hard, and are working but one man—single-hand drill—on a shift. Total length, 40 ft. At the surface everything is in perfect working order.

BONIE TUNNEL.—Advance made in the main tunnel for the past week, 13 ft. The formation continues of the same favorable mineral-bearing character as in the last 100 ft. The south drift on No. 7 ledge has been advanced 11 ft—single-hand day shift—for the week. They are simply stripping the ledge and taking out only such ore as falls in the work, which continues to average good milling ore. The air pipe is all laid, giving a fine ventilation to all parts of the mine.

SOUTH STANDARD.—The work of repairing the engine and boilers was completed on Thursday and sinking resumed, since which time fair progress has been made. The surface water continues to retard operations in the shaft to some extent. It is, however, decreasing daily, and in a short time will be entirely drained. The formation in the bottom of the shaft is very favorable, being quartz, clay and porphyry. The machinery is now working well and gives good satisfaction.

ORIGINAL SUMMIT.—The east crosscut on the 200 level is now in 43 ft. The rock is very hard, and progress necessarily slow. This crosscut will be continued until the east ledge is cut, which it is expected will be at about 20 ft, when that ledge will be developed and sinking for a lower level commenced.

NEVADA.

GRAVEL MINES.—Nevada City *Transcript*, May 23: Numerous gravel mining companies at Sierra City are making arrangements to incorporate, and several have done so already within a few months. It is figured out by old prospectors that at least 3 very rich blue lead channels course through the high ridges above that mining camp.

NEVADA CITY MINE.—As developments progress in the north drift of the 2d level of the Nevada City mine, the character of the ledge improves. The chute that yielded 300 tons of $30-rock in the first level is found to be of equally good appearance below.

THE hydraulic miners on the Ridge are happy at the prospect of plenty of water the coming season. The mines are now running full blast.

MINING ITEM.—Steam was raised in the boilers of the Fortuna mining company yesterday afternoon for the first time, and the work of pumping out the incline was begun. As soon as the workings are dry, the extraction of ore from the 1st level and sinking for a 2d level will be commenced.

PLACER.

MILLS AT EMIGRANT GAP.—Cor. Placer *Herald*, May 22: The quartz mills around here will run this season—the Diamond Creek, Yuba and Lindsey. Mr. Jones ran a tunnel and struck a 3-ft ledge in the bottom, carrying considerable sulphurets and showing the gold plainly.

CONSIDERABLE excitement prevails respecting quartz ledges hereabouts, several of which have been located recently; one on the trail leading to Iowa Hill, by Capt. Anderson; another, by the same party, at Secretown; another, which crosses Squire's canyon (which has paid, and is still paying, very rich), by Carr, McIntosh and Kopp.

IOWA HILL NEWS.—The Orion has been running steadily for the past 10 days. Superintendent Anderson reports the boxes looking better than he has seen them look, after the same number of days run, since the mine has been operated. The Morning Star has had new Giants put in place. A large amount of gravel has been washed at the Mitchler mine during the past two weeks, and the sluices look as well as usual. Jo. Pritchard cleaned up after a short run at his mine, and says he is well pleased with the results, and the gravel improves as he works north. The shaft at the Aurora caved several times during the past 10 days, causing much delay and annoyance. The shaft had to be abandoned for the present, and the District is being washed through an open cut. The Woodbine is being opened in good shape with both bedrock tunnel and open cuts. A large amount of gravel has been washed. The boxes look well and considerable coarse gold is to be seen in bedrock cuts. The Olencoe, a drift mine, north of the Wolverine, has been refitted, and is now being worked by Messrs. Jolly & Southwick. Pay gravel has been struck in this mine, and as soon as the dump is built, washing will commence. Considerable gravel is being washed from the Barber mine, and should the water season be a late one, the county road will have to be moved out of the way. The Homeward Bound is running in good shape and washing gravel fast. The Watt Brothers' mine, on Mount Pleasant flat, fronting on Indian canyon, and running back to the Succor Flat mine, on the main ridge, has been drifted in front and which paid rich in early days, is being reopened with a bedrock tunnel. Good prospects have been found and all the indications, both in the character of the gold and gravel, leads to the belief that this and the Succor Flat channel are one and the same. The Trio mine, at Bird's flat, has been fitted up for hydraulicing, and is now running in good shape. At Wisconsin and Prospect hills the hydraulic mines are all running in full blast. The Harmon property, with Zurmuehler's ditch, is bonded by Eastern parties.

PLUMAS.

BELL MINE.—*National*, May 15: The first clean-up of the Bell mill, since the "new departure," was made this week, and resulted satisfactorily. The mill ran three days on rock that was not considered good, as it was thought best to put through some of the poorer rock first, and get everything into good order before crushing the first-class ore. During the three days about 45 tons of rock was crushed, resulting in a clean-up of between 90 and 100 ounces of amalgam, or between $500 and $600. Mr ff. N. Brown, the new amalgamator, has adopted a process entirely different from any heretofore used in the mill, and the result indicates that much gold has been lost in the working heretofore. Mr. Bell is pleased with the prospects of the mine, as he is satisfied that they have plenty of rock which will pay better than that crushed in this run.

BIG MINING ENTERPRISE.—Plumas *National*, May 22: Mr. H. C. Newberry is now in the lower country making the preliminary arrangements for a mining enterprise, which bids fair to be one of the most successful hydraulic operations in the mountains. He contemplates bringing the water of Taylor creek to the Deadwood Channel country, at an altitude which will give all necessary pressure. The surveys recently made by Surveyor Keddie, have demonstrated the practicability of the project, and there is every reason to think that it will be carried forward. The vast extent of rich gravel which would be attainable if the water was brought on, makes the result a certainty, and Mr. Newberry has surely "got on the right string," if he can bring to bear the capital necessary to the work.

BELL MINE.—The clean-up spoken of last week, resulted fully as satisfactorily as was anticipated, between $500 and $600 being taken from 45 tons of rock. The mill was started up again on Sunday, and the indications are that the results from this run will be a decided improvement on the last.

STRUCK IT.—Two young men, named King and Neseman, have discovered a valuable gravel claim in a gulch which puts into Mohawk valley on the south side, near Mrs. King's ranch. They made from $5 to $10 per day to the man as long as they had water, and are now bringing in a ditch to work the claim.

SIERRA.

SCALES' DIGGINGS.—Cor. *Mountain Messenger*, May 22: The depth of the snow has not at any time exceeded 11 ft, and now we have not over 5 ft. Snow at the Mt. Pleasant ranch about 6 ft, while on the summit, 2½ miles from here, it averages from 25 to 30 ft in depth where it has drifted. Fairplay mines are in full blast, employing about 16 hands. The Cleveland company is employing 20 hands, and the Union Hill company about 18 hands. These companies have very rocky ground, and have to use derricks run by water power to remove the rocks. It is wonderful to see the enormous amount of rocks removed in a day by a few of these derricks. The length of the water season this year will hardly come up to the average.

MINING ITEMS.—*Mountain Messenger*, May 22: Dr. Biber has employed f. G. Jones to survey the Forest Queen quartz claim, located just south of town, and has a party in the field doing the work. The American Hill mining company is in full blast, piping off large quantities of dirt with plenty of water; working 2 monitors. They expect to do well this season. Dr. Biber is busy with his men preparing to prospect the Forest Queen quartz ledges, just south of town. He has 2 large ledges in sight, the rock of which he assures us prospects well. A piece of gold weighing $75 was taken from De Long's diggings in Hog canyon, a few days since. We understand that the Savage company has let a contract to run their bedrock tunnel to a gentleman from Virginia City. It is rumored that the contract price is $20 per ft.

LEDGES.—Nevada City *Transcript*, May 22: Rich quartz ledges have recently been discovered near Allegbany, and the country along the creeks le located for miles. The Savage gravel mining company, composed of leading Virginia City capitalists, whose mine is located on the ridge near Sierra City, has let a contract for 200 ft of tunnel at $20 per ft to John Herby. Considering the formation is the hardest quartzite rock, the price is reasonable enough. The North fork gravel mine, at Forest City, is not paying at present, but another rich strike may be looked for at an early day. The last clean-up was surprisingly large. This claim so far has been "spotted," but the owners are sanguine of eventually finding a branch of the main blue lead channel which will fully equal in richness any heretofore developed. Thousands upon thousands of dollars have been expended on this mine.

TRINITY.

FOREST FORKS.—Cor. Trinity *Journal*, May 22: Here at Forest Forks the late severe storms have delayed everybody, but now all are at work again with prospects of a very large run of water. Slide Creek gold mining company some three weeks since had a great slide, carrying away over 125 ft of their flume, which took some 10 or 12 days to repair the damages done. They are at work again. Their last clean-up was better than any previous, having cleaned 18 ounces in 6 days' run—a very fair showing, as they have only four men in the claim. Their bank is now about 40 ft high, of which 15 to 18 ft is wash gravel. It just requires their rigging to work such a bank, and as their dump is very high they are probably doing more work than any four men in the county. Messrs. Brooks & Sherwood are building a house and getting ready for a good season's work. They have two ledges. Specimens were found some years ago that weighed 18 ounces; and one found two years ago by Mr. Brown weighed 13 ounces. Some very nice specimens have recently been found, two by Mr. Brown last week weighing respectively $10 and $8; and one the same week by Mr. Guillaume of $16—all on Pony creek. Mr. Brown is very lucky with finding large specimens. He has dug out five pieces this winter worth $46. Another large piece was taken out last summer. I do not know the exact value, not having seen it, but it is said that it was over $200. The great *desideratum* of this place is a few men with sufficient capital to rig claims with pipes and giants. Such claims would pay well where the method now employed—ground sluicing—fails to pay, the result being that those claims only are worked where the boulders are not too heavy to handle. It is a positive fact that there is more gold on New river than any other of the numerous streams of these regions. In the same volume of gravel the difference being that in ground sluicing in most places more gravel is washed out in a given time than is done here. And if it pays now how will it be when claims are rigged so that most of the boulders are sent through the flumes? The result obtained by Slide creek shows.

TUOLUMNE.

OLSEN MINE.—Tuolumne *Independent*, May 22: The mine is in active operation, 21 men being engaged erecting the hoisting works and putting the engine in place, making roads, etc., while several carpenters are at work erecting a fine 2-story building, to be used when finished for a lodging house, thus making Golden City quite a lively place again. A 10-stamp mill has been constructed in San Francisco, with a capacity for crushing 30 tons a day, which will be forwarded now shortly, and erected for convenience of water power on the Tuolumne river, about 5 miles distant. The ore will be carried there at first in wagons, which in time will undoubtedly be superseded by a tramway, connecting the mine with the mill. The ore body is from 10 to 18 ft in width, and has been prospected 230 ft; how far beyond it extends is not known, but will soon be prospected. The decomposed mass coming from the bottom of the shaft, upon being prospected in a pan, showed free gold in large quantities.

THE Perera claim, at Jamestown, is a recent discovery and is not yet developed. The ledge is in the nature of seams, ranging from f to 4 inches in width, some of which is very rich.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, May 26: The north drift on the 2500 level, running from the main east drift on that level, 350 ft east of the incline, is in 90 ft, and continues in heavy vein material of a very promising character. The drift sent in from the face of the main crosscut east penetrated a total distance of 240 ft and found some water.

UNION CON.—In the drift to connect No. 1 winze on the 2500 level with the station of the Sierra Nevada incline, some narrow streaks of fair grade ore have been encountered, but not of sufficient strength to pay to assort out, nor rich enough to raise the quartz passed through to milling ore.

BELCHER.—In pushing the south drift on the 3000 level ahead some quartz of a bright, lively and promising character has been encountered. Work in this direction is being urged forward with all the energy possible.

CALIFORNIA.—The winze from the 2000 level has connected with the raise from the 2100 level, and now the ore known to be in this part of the mine can be reached and extracted.

SIERRA NEVADA.—The drill having been sent ahead in the west crosscut, 2300 level, a total of 58 ft and finding no water to binder, the crosscut is being pushed ahead; total length, 70 ft.

YELLOW JACKET.—The station at the 2328 level, corresponding with the 2700 level of Crown Point and the 2760 level of the Belcher, has been completed and the drift started to connect with those levels.

MEXICAN.—The north drift on the 2500 level has attained a total length from the Ophir line of 160 ft, and is still in vein material.

SILVER HILL.—The crosscut east, 1300 level, from the drift south, is now in hard rock, carrying stringers of quartz. It has passed through some streaks of good quartz giving fine assays. There is another formation ahead still more promising.

BULLION.—The east drift from the station on the 2450 level of the double incline winze had last evening been extended 30 ft. To meet this drift, one had been started from the Ward shaft, 2300 level, and run 15 ft. These workings will be connected as soon as possible, and all work thereafter be done through that shaft.

UNION SHAFT.—The placing of the sinking pump in the shaft will necessitate the carrying of the sump to a greater distance below the 2500 level than was originally intended, since that pump is itself 35 ft long and must be worked entirely below the station.

NORTH BONANZA.—The north drift, 600 level, is averaging 5 ft per day, and is in a most promising formation.

OVERMAN.—Crosscut No. 4 is making rapid progress east on the 1900 level; total length, 112 ft; the face in good vein material.

CON. VIRGINIA.—East crosscut, 2300' level, joint with California, has attained a length of 150 ft, and continues in heavy vein material. The drift south on this level is now 60 ft in length and in vein matter.

ALTA.—The west crosscut on the 1950 level is now 300 ft from the lateral drift and still in vein material. The diamond drill and crosscut opposite were sent in 432 ft.

NEW YORK.—The drift south along the new ore body is being pushed steadily, and the formation still continues to look and promise well.

SUTRO TUNNEL.—North lateral branch is now 260 ft into California ground; total length, 3073 ft. South lateral branch 396 ft into Bullion ground and in decomposed quartz.

ANDES.—Working between the 2d and 3d levels, 300 ft below the surface, and getting good indications of ore.

EUREKA DISTRICT.

WALES CON.—Eureka *Sentinel*, May 21: Our reporter has just visited the Wales Con. and found their new hoisting works very complete. The building has a frontage of 54 ft, in which are situated the blacksmith shop, carpenter shop, and also a circular saw, for the purpose of cutting wood for the engine. The engine is rated for a capacity to sink 1,000 ft. The shaft is a double compartment one, 150 ft deep, and is well timbered and cribbed. A large amount of work has been done in the way of running drifts, crosscuts and winzes. Two shifts of men are now employed. The principal work being done now is the sinking of the compartment shaft, which is to be sunk 150 ft deeper than at present, so as to connect with the 300-ft winze.

MINING ITEMS.—The owners of the Phil Sheridan mine, on Ruby hill, are about to let a contract for sinking a shaft and prospecting the mine. All the vacant ground on McCoy hill, on the west side of New York canyon, has been located during the past month, and a number of locations have been made along the footbills on the western side of Prospect mountain. George K. McCullough has opened up a fine body of rich milling ore in the Reeves & Berry, at Spring valley. Richard Charnock has several tons of very fine ore on the dump of the North Star mine.

ARIZONA.

BABOQUIVARI DISTRICT.—Tucson *Record*, May 22: Six tons of ore from the Alta mine, Baboquivari district, worked at the Arivaca mill, gave a yield of about $200 per ton. The mine is bonded for a sum reported as $30,000 to San Francisco parties. Col. Woods is preparing to take ore out of the Oriental, having sent sacks out for the purpose of containing the ore. The mine has a shaft 28 ft, and the dump carries about 25 tons of high grade ore. Everything is looking lively and business-like in the district. Several of the best mines are being worked by three shifts, and developments are of the most favorable character. This is probably the highest grade district in the county, and the ore veins are large as well.

FINAL DISTRICT.—*Drift*, May 15: The Belcher mine is the property of Wheeler, Doran and Graham. It is in view from Final, about two miles distant. There is a tunnel in 100 ft, a shaft 50 ft connecting with the tunnel; another prospect shaft on the ledge is 60 ft deep. The pay ore is near 4 ft in width at the bottom of shaft No. 2. Over 100 tons of ore on the dump assays from $50 to $1,000.

SILVER BELT DISTRICT.—*Arizona Star:* From the Silver Belt district, we saw some splendid specimens of gray copper ores brought in by Messrs. Rea and Swan. This camp is situated about 40 miles southwest of this place, and 16 miles from the nearest point to the railroad, in what is known as the Young American copper mountains. The locations are held principally by Messrs. Shaw, Fish & Co., who have bounded three of their group: the Arizona, Old Boot and Blue Coat, to Samuel Hughes, for $12,000. They have at least 300 tons of ore on the dumps of these mines. The deepest shaft is not down over 10 ft, which assays, on an average, 50% copper, and $50 to $60 in silver. The ledges seem to vary from 4 to 10 ft in width. These enormous veins or deposits run parallel, and several are embraced in one claim. Messrs. Rea and Swan own the Scout mine, near the Boot. A tunnel has been run into the lead, opening a solid mass of the same kind of ore the entire length of the tunnel without yet reaching the hanging wall. Tons of high grade cropping can be picked up on the surface for several hundred ft along the ledge, indicating that immense bodies of ore must lie beneath. Messrs. Pby, Sault & Co. have also some promising ledges of the same class of metal, and are working them with promising results. Their claims all lie within a radius of a mile, and promise to be one of the biggest things of the kind in southern Arizona, and from its close proximity to railroad communication, greatly increases their value, and we congratulate the owners on their good fortune. All facility for mining in this locality is reasonably convenient.

Miners' Strikes.

The telegraph informs us that on Wednesday last some 2,700 miners struck at Leadville, demanding an advance of from $3 to $4 per day. They held a meeting and visited the mines, compelling ths other miners to quit work. Several mines have refused to accede to their demands. The arms of the several Leadville military orgauizations are in the hands of the strikers.

There had been little or nothing rumored as to the movement until it developed itself. The wages paid are from $3 to $3.50 per day. At seven o'clock 400 men appeard at the Chrysolite mine and ordered' out the men. After some consultation, the demand was complisd with, and the men joined the strikers, who proceeded to the Iron, Carbonate and Breece Hills mines.

On Wednesday night there was not a man at any of the mines. It is estimated that 5,000 men are participating in the movement, while perhaps 3,000 other miner are remaining quiet at their homes. All the prominent mines are strongly guarded. The excitsment is feverish. Michael Mooney a Mollie Maguire from Pennsylvania, is at the head of the movement Thus far there has been no violence, and it is hoped that no serious results will follow, although the managers are generally showing their resolution to not yield to the demands of the strikers.

They are having trouble at Phillipsburg, Montana, about the Trout mine, belonging to the Northwestern company. As we understand the matter from the local papers, the company failed to pay the workmen, and the employees took possession of the mine in July, 1879. One John Caplice, of the firm of Caplice & Smith, made a proposition to the miners, saying that the company owed the firm of Caplice & Smith about $3,000; that he would go East and try to raise the money to pay the employees their wages, and if the company would not furnish the necessary amount that he would not accept the position, hut would come back and co-operate with the men, work the property and pay themselvcs out of the net proceeds of the mine and mill, which was accepted and no objection offered. The firm came into possession of the mine hy suit and attachment. There is now a disagreement between the miners and Caplice. The miners have possession of the mine. The Sheriff's officers who went to arrest the men holding forcible possession of the mine were unahls to dispossess them and did not serve the papers. The mail carrier states that the prevailing impression in Phillipshurg is that the men will resist to the last any effort to compel their surrender. They are now said to hs working the mine, their numher having been reinforced sufficiently to enahle them to keep a strong guard on the surface. There are no fewer than 60 men in present possession. What course the court will pnrsue in snforcing its mandate is not positively known, hut it is thought likely that Judge Galhraith will call on Governor Potts for troops.

The strike at Omaha at ths smelting works is over, and work was resumed on Monday the 24th inst. On Sunday the strikers voted to accept the compromise proposition of an average advance of ahout five per cent., common laborers to receive $1.65 for 10 hours, their former pay having been $1.37 for nine hours. The compromise was hrought ahout hy arhitration hetween the strikers' committee and the managers and Governor Nance. The strikers, about 200 in all, have been out nearly three weeks. They are all to he taken hack, that being a condition precedent to acceptation of the compromise.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

FAIR VIOLA M. CO.—May 26th. Object: To operate in Arizona. Capital, $10,000,000. Directors—L. M. Pearlman, James L. King, James M. Vizina, A. B. Hull and Henry Ingraham.

HIGHLAND M. CO.—Object: To operate in Lincoln county, Nevada. Capital, $10,000,000. Directors—Henry Mayers, A. Rickert, A. H. Rutherford, Albert Meyer and Julius Haumeister.

PACIFIC COAST APPROPRIATIONS.—The following items for the Pacific coast are in the Sundry Civil hill reported May 22d: For the completion of the Appraisers' huilding in San Francisco, $3,500; for completing the lighthouse with fog-signal at Admiralty inlet, W. T., and for huilding steam-tender for general service on the Pacific coast, $45,000; to enahle the Secretary of the Treasury to use revenue cutters for the protection of Government interests on Seal island and the enforcement of the law in Alaska, $20,000; for the appraisement and sale of the Fort Dalles Military Reservation in Oregon, and other abandoned military reservations, $5,000.

Nevada's First Nugget.

An interesting correspondence has lately passed between Eliot Lord, of the United States Geologic Survey, and John Orr, the first discoverer of gold in the State of Nevada. Under the supervision of the Director of the Geologic Survey, a history of

The Comstock Discovery

And mining developmente on the east slope of Nevada, is being prepared. Mr. Orr, at present residing at Duncan's Mills, Sonoma county, has in his possession the first gold nugget known to have been found in Nevada, and the inquiries of Mr. Lord have been in relation to the circumstances of its discovery, and the possibility of securing it from Mr. Orr, by donation or purchase, for the collection of minerals in the National Museum, at Washington. In conversation with Mr. Orr, a day or two ago, he stated the facts relating to the discovery. He started with a large train to come across the plains in 1849. Unusually severe weather was encountered, the roads were bad and they were compelled to spend the winter at Salt Lake. He left for California on the first wagon train from Salt Lake in the spring of 1850, but the desert was not crossed until the last of May, because of high waters, and the fact that their road had to be cut through the snow until the Humboldt was reached. Orr had a partner named Nick Kelly, after whom Kelly's ravine is named, and in the company was also one William Prouse, now living in Nurh City, about 40 miles southeast of Salt Lake. Prouse had worked in the mines in this State, before gold was discovered in Coloma, and was a good prospector. One early day of May, 1850, the train stopped on the edge of what is now known as Gold canyon, near the Carson river, to let the animals feed on some bunch grass found growing amongst the sage brush. Prouse at noontime took a milk-pan, and going down to the gulch, began washing dirt, in

A Few Minutes Getting Color

To the value of a few cents. Orr then named the place Gold canyon, still retained. Orr was keeping a rude chart of the country traveled over, taking bearings only north and south, and estimating the distances traveled every day. Gold canyon was marked on the chart which was lost by Mr. Orr in 1855, while returning East to be married. The train soon after resumed travel, going to the head of the Carson valley. There was met a party of seven, who had left the train at the sink of the Humboldt, intending to go in advance to California and select good locations for the remainder of the party. They had been unable to cross the country, and had been lost in the snow in the mountains four or five days, unable to find the divide to Hangtown, and seeking Carson to recuperate. A stay in Carson for three weeks followed, when Orr, Kelly and several others returned to Gold canyon and resumed prospecting. Kelly and Orr went up the canyon until a little fork was reached, when work was begun. The party had few tools, and

Orr Had Nothing but a Butcher-Knife.

While Kelly was working, Orr noticed a very narrow place at the fork, where the water barely covered a slab of slate rock. Idly he examined it, and noticing a small crevice near the edge, drove the butcher-knife into it, breaking out a piece. The water running over it washed away the underlying dirt, and in a few seconds Orr discovered a golden nugget where the rock had covered. It was quickly removed and afterwards found to weigh $8.25. This was on the 1st of June, 1850, nearly 30 years ago. Prospecting was continued, and though gold dust was found in several places throughout the canyon, Orr's was the only nugget found. The party lacked tools and provisions, and being bent on reaching California, abandoned the canyon and arrived at Leek Springs, July 4, 1850. Orr offered the nugget to Kelly, who refused to accept it, and as it was the first piece of gold he ever dug, Orr, for a few years kept it as a souvenir on that account. Of late years inquiry as to the

First Discovery of Gold in Nevada.

And the settlement of the discovery upon Mr. Orr and his nugget, have induced him to state that the nugget is not for sale, nor will it be donated to any museum. He has four grown sons, and will keep it for them, to be passed down as an heirloom. Mr. Lord writes that the survey in their contemplated work will acknowledge the first discovery as stated above. *Alta.*

Heating Boilers by Electricity.— We take the following from the *Electrician:* "Mr. Charles Davis, of Paris, has conceived the bright idea of heating ordinary steam boilers, by winding them spirally with platinum wires, and sending through the wires a current of sufficient strength to boil the water. Mr. Davis, however, has omitted to state how much platinum wire he will require, and whether he expects to buy it second-hand; also, how he is going to insulate his wire electrically from the boiler, and yet heat the latter; also, how he intende to produce the requisite amount of electricity, and lastly, at what cost per horse-power he intends to furnish the steam."

Action of Ozone on Metals.—Silver is said to quickly assume a coat of black oxide under the action of ozone. Gold and platinum, however, remain unaffected.

Arizona Placers.

The *Arizona Sentinel* says: Until very recently the attention of mining men from abroad has been directed principally to the more remote portion of the Territory; lately, however, it seems to have been discovered that extensive fields for profitable investments and lucrative mining operations have been passed over unnoticed in this immediate vicinity. That valuable mines of gold, silver, copper and lead, exist on both sides of the Colorado river and in close proximity to it, from this point up as far as the Great canyon, is a fact which we are pleased to notice has become patent to many who have sought points of investment hundreds of miles east of here without success. In addition to the many mines now in successful operation near town, there are other valuable discoveries being made every day; many of those mines and new discoveries are within a comparatively short distance of the river, thus affording advantages in the matter of economical working which a large proportion of the mines in the interior of the Territory can never enjoy. In addition to the numerous ledges of mineral, occurring throughout the mountain ranges along the Colorado, there are immense fields of placers that are beginning to attract merited attention; these placer fields may be found almost everywhere along the foothills of all the mountain ranges, and in the mesas and plateaus of the adjacent valleys, and consist of decomposed party and debris from the mountain, the depth of the accumulation being from a few inches to several feet. Papagos and Yackee Indians by their primitive method of dry washing have for years been obtaining gold in sufficient quantities to afford them ample sustenance, although only the coarser or heaviest portions are collected by their crude method of extraction—the fine particles, or flour gold, contained in the dirt, they cannot save. A knowledge of the existence of these placers, and their great extent, have induced a few gentlemen in San Francisco to organize a company, with a view to testing this dirt and gravel by actual work, and for the past month they have been carrying on their investigations upon the placer mesas along the Gila river at a point about 16 miles east from here; their working tests so far have shown that the dirt contains from 50 cts. to $1.50 per ton in fine gold. The company have secured by location large tracts for future workings, and the superintendent has proceeded to San Francisco for the purpose of procuring additional machinery, necessary for extensive operations on the Gila, but also in the vicinity of Plumoso, Agua Merva, Tyson's Wells and other points where the ground is almost unlimited in extent, and of greater richness than that which they have recently explored along the Gila.

More Gold Mines.

The gold camp ten miles east of this city no longer maintains a monopoly in the line of gold discoveries. Doe Cahezas has been chief, and its mines have been yielding the auriferous for years past. The Chericachuas have had spurts for excitements, and the Mule Pass mountains also hold valuable gold mines, but now comes like a meteor a new field that for brilliant, sparkling specimens, takes the belt.

The country is situated about on the boundary line of Sonora, a line that from current reports is not a fixed immovable line like the equator, but a line that is said to switch about like a cow's tail in fly time, from one side to the other, but always with the design to have mines on the Arizona side, so as to be regulated by our laws, and the mescal distillery on the Sonora side, where the U. S. Revenue laws can't "pull" them.

To be more exact these new gold discoveries are between the San Jose and Mule Pass mountains, in the foothills in line between the mountains. They were first discovered some time ago, and have been worked by Mr. Slaughter, the great cattle man, for several months, and an arastra has been in use to reduce the ore. And his mines upon the northeast point of the San Jose mountains, and the new discoveries are several miles away in the foothills towards the Mule Pass mountains. They were discovered by Peter Egloff, and located in connection with C. Anshutz and our friend "Kentuck." The vein runs northeast and southwest, is in quartz and lies in contact between granite and gneissoid slates, and averages, as far as shown, about two feet wide. We were shown an ore sack full of specimens, every one of which had gold specks on it, and some of them were rich. Many of the specimens had nuggets of gold in the quartz that showed as large as a grain of wheat. We took one specimen that showed no gold to the eye, and had it assayed by Mr. Bacou and got a result of $248.08 in gold, and $6.23 in silver. The veins are marked by an iron-stained black quartz cropping, and the ore is in a fine sugar-grained quartz with iron, and at times a little galena mixed in. Mr. Slaughter at his mine has a shaft 30 feet deep, and a vein from 2 to 3 feet wide and has good results from his arastra.—*Tombstone Nugget.*

The production of petroleum now exceeds 65,000 barrels daily. The stock in the United Pipe Lines is over 9,000,000 barrels, and notwithstanding 1,500,000 barrels of tankage are under contract and in process of construction by the lines, there is danger that they will not be able to take care of all the oil offered, and that some of it must run to waste.

Too Much Unprofitable Pumping.

Although by good management the Belcher, Imperial, Bullion and Yellow Jacket companies are able to handle all the water now flowing into their lower levels, it is beginning to be seen that it is a business that hardly pays for the outlay of coin, muscle and steam. Besides, it is full of risk. In order to handle this influx of water it is necessary to run the pumps so rapidly that there is great danger of breaking the rods. Such an accident would not only be expensive, but also would occasion delay and further complications. To run the hoisting tanks as rapidly as is now being done at the Yellow Jacket shaft is hard on the cables, as it is liable to cut the filling out of them.

It would be better to plug up all drill holes and reduce the influx of water as much as possible at every point, keeping it so reduced until the Yellow Jacket pumps are ready to start up. There is other work that can be profitably done in the interim. We understand that some of the drill holes, if not all, will to-day be plugged on the 3000 level of the Belcher.

This will relieve the Jacket and Imperial greatly. What with pumping water from the Bullion and with handling their own, the Imperial folks are just now in such a situation that it will not do for them to start another inch anywhere. The flow in the Bullion was a good deal increased yesterday at the point where the station is being cut out on the 2450 level, and things are now at such a pass that about the only occupation of the several companies of this group is the very unprofitable one of pumping water. The water cannot be economically handled, and all that can be plugged up and kept back should be so secured for the time being, as when the big pumps start up at the Yellow Jacket it can be snatched out in short order.

The first thing to be done at the Belcher is to connect the Crown Point on the 3000 level and get a good strong current of air into that sweltering region. This done crosscutting can be comfortably proceeded with. It is probable that the vein to the eastward of the main north and south drift will drain out by the time the connection is made with the Crown Point, even though all the drill holes are plugged, as there are many natural leaks that will bring out a great quantity of water. By bottling up the water on the Belcher 3000 level the pumps of that company will be able to relieve the Yellow Jacket folks to such an extent that they will be able to resume work in the bottom of their shaft.—*Virginia Enterprise.*

Locomotives and Conflagrations.—The great forest fires which have recently swept over thousands of acres in New Jersey were not all caused by sparks from locomotives, but it is alleged that several of them were, and especially one of the most destructive of those which made last week so terrible to the residents of New Jersey. The fact that many of the fires have raged along the line of railways is made one of the foundations for the assertion that sparks from locomotives were the origin of them. The oil fires of the Bradford district in Pennsylvania, too, are said to have been caused, in several instances, by sparks from locomotives, and it is plain that an investigation as to the part of locomotives in starting conflagrations should be made. If in seasons of drouth forests are much imperilled by passing locomotives, especial precaution should be provided against the evil, and some system of protection against fires from locomotive sparks should speedily be devised and adopted in the oil regions. If investigation reveals that fires from locomotive sparks are more frequent than has been commonly supposed, the fact will suggest an important opportunity to inventive genius. How to construct a locomotive so that the emission of dangerous sparks will be impossible, is a question which some inventor may find profit in pushing to an investigation it has not yet received. The owners of pine and cedar groves in Ocean, Burlington, Atlantic, Cape May and Cumberland counties, New Jersey, are especially eager for inventive activity in that direction.—*N. Y. Mail, May 10th.*

Mining Rulings.—A Washington correspondent of the Salt Lake *Tribune*, writing to that paper, says: The Commissioner of the General Land Office, in reply to a letter from Park City, Utah, says he knows of no law which exempts unpatented mining property from execution, and that the United States mining law does not prohibit the same party from holding more than one claim on the same lode. The Land Commissioner says, in reply to a letter from Idaho, that a party is not authorized to go within the claim and possession of another party and discover a ledge on which he may base a location. Hence his location would be void, and so far as this office is concerned, the location of a third party upon a ledge outside the first location but within the second, would probably be recognized as legal. The matter, however, would doubtless be adjudicated in the courts whose decision this office would only be called upon to execute in the event of application for a patent. Second—A locator's record should conform to the actual location on the ground and the only proper method to correct a mistake in this matter would be to make a new record. Third—It cannot properly be stated just how far a locator may deviate from the plain requirements of section 2,624 of United States Revised Statutes in making his location and yet save his claim. Strict compliance with the law is the only security with a locator.

Improved Method of Diving and Staying Under Water.

The apparatus now in use for supplying air to divers engaged in sub-marine operations is both cumbrous and unsafe, the air-tube limiting the movements of the diver, and, by its liability to become entangled and crushed, causing a risk that the supply of air for respiration may be cut off altogether. A new method, in which these drawbacks are escaped by dispensing entirely with the air-tube and pumps, has been invented by a Mr. Fleuss in England, and lately exhibited at the Royal Polytechnic Institute in London. Dr. B. W. Richardson was given an opportunity to closely watch its operation, and from his description we glean the following account of the experiments: The peculiarity of the method consists in the diver taking a full supply of air-food down with him, which dispenses with pumping, no help being needed except a signal-man and cord. Mr. Fleuss is both inventor and diver. He descends into the water in an ordinary diver's dress. It consists of helmet, breastplate and common water-tight armings and leggings. On his shoulders he carries a weight of ninety-six pounds, and on his boots twenty pounds. A light cord is attached to the helmet for signaling to the person above. Before the mask is closed and the helmet adjusted, an "ori-nasal mouth-piece," with a breathing-tube of an inch bore proceeding downward, is firmly tied over the mouth and nose. Dr. Richardson carefully observed two experiments, one of twenty minutes' length, and another of an hour; and was assured by the diver that when under water he breathed as freely and easily as in the air. This was confirmed by his appearance and condition at the end of the longest experiment. He moved about the floor of the tank, picked up coins, and could lie down and get up without difficulty. The exact mode by which breathing is effected Mr. Fleuss declares to be simple, though it still remains a secret; but it is wholly carried on within the apparatus, not even the expired air becoming apparent in the water. The facts demonstrate that, without assistance from above, a man who has had no previous experience of diving or remaining under water can take down with him sufficient oxygen to live there easily for an hour; and but for the cold the diver asserted that he could have remained another hour and a quarter, and that he could easily arrange to remain four hours. Depth he said would make no difference as to breathing within the apparatus. Dr. Richardson is enthusiastic over the practical possibilities of the discovery. If a man can thus take his stock of breathing material with him and live for hours without external access of air, he may extend the field of his industries and investigations into the deep sea, or the most rarified atmospheres, into mines filled with choke damp, or amid the suffocating smoke of conflagrations, without fear of consequences.

Mining Resources of Amador County.

Amador county, named like other counties of this State, after one of the early California families of Spanish origin, has El Dorado county on the north, Alpine on the east, Calaveras on the south and San Joaquin on the west. It has a conformation long and narrow, in its geology and topography. In soil, climate, timber and other natural resources, it is unexcelled. The proportion of farming land is great. The eastern section of the county is very rugged and broken, reaching an altitude of between four and five thousand feet. In a metalliferous point of view it is for its size an important county, a belt of auriferous earth and rock about twelve miles wide running entirely across its lower and more populous part. Along the westerly edge of this belt rest the *vera madre*, in which lie some of the most profitable and largely productive quartz mines in the State. Quartz mining is full of of instructive and encouraging lessons to all who are now engaged or who may contemplate engaging in it. It has already been explained that there is one leading quartz vein, or rather system of veins, running longitudinally across and very near the center, laterally considered, of the great gold-bearing belt of California. There are other subordinate groups of veins running parallel to and on either side of the main vein, the distance separating them varying from two or three to ten or twelve miles. Although the intervening space frequently contains valuable lodes and masses of quartz, the most largely productive and permanent deposits of auriferous ore are usually found along these parallel channels, occurring in bunches known as chimney, or chutes, which are very unevenly distributed, apparently without reference to system or regularity, as some portions of these veins are rich in precious metal, while others are barren—even all semblance of a lode for a long distance entirely disappearing. This grand central vein is generally called the mother lode. In stating that this lode is more productive than any other, it is meant that it affords a greater amount of pay rock, and it can be extracted at less cost than that found in smaller veins, encased in harder varieties of metamorphic rock; not that the ore is of richer quality, as it is in fact of a lower grade than California ore generally. With this much of premise, it will be understood that the operation of quartz mining and milling is confined to certain belts of the State, though occasionally extensive and profitable fields for carrying on the business present themselves in regions far removed from the mother lode. These are termed outside districts.

Oregon Mining Interests.

We take the following from the *Bedrock Democrat:* Important as the miniag interests are to every one in Baker county, in fact in all eastern Oregon, it must be exceedingly gratifying to them to know, that with the opening of the season, extensive operations are being commenced in more than one of the very largo and valuable tracts which Eastern capitalists have of late sought for investments.

During the week we noticed that the Placer Gold Mining Co. of eastern Oregon had commenced work on their splendid property on Clarks' creek. This company have acquired a very extensive and valuable claim, comprising 384 acres and including over 40 miles of ditches, with an exclusive ownership in all the water rights and privileges, thus giving them entire control over anything of value in that locality.

It is several years since first experienced miners discovered the great richness of this locality; but curious as it may seem, but few have prosecuted the discovery with any vigor; notwithstanding this, it is a well established fact that in no single instance where developments have been made have the parties failed to obtain the most substantial results; out of what might be esteemed even insignificant claims, reasonable fortunes have been acquired, and every test has established the fact that the richest deposits of Baker county lie at the disposal of this company awaiting development.

The resident manager, Mr. Wm. D. Kennedy, is pushing forward operations with that energy which is characteristic of Chicago men; the repairs and enlargement of the Clarks Creek ditch are almost completed, the piping is being set in place, and two "giants" will shortly demonstrate the power of hydraulics. The large ditch, known as the Burnt River ditch, is also to be put in complete order, and though this work will involve considerable outlay, yet the investment will be a mere bagatelle compared with the revenue which must accrue from the thorough equipment of this great enterprise.

While from the narrow-minded standpoint of some, it might be a source of regret that the splendid results which undoubtedly must flow from this magnificent enterprise should fall into the hands of the irrepressible Chicagoan, yet to us it as a matter of sincere congratulation that at last vim and energy are to supplant lethargy and apathy, and the untold wealth of eastern Oregon brought to the surface by that same pluck and grit which burned down and rebuilt one of the liveliest cities in the universe in about the same time that it would take the average Oregonian to arrive at a well-conceived idea. We say God speed to all who come among us in association with legitimate enterprise, and to none that have so far come can we so cheerfully extend a welcome as to the company above referred to; its directory is composed of "solid men"—men whose names are a credit and endorsement to any company. We may have more to notice in this connection.

RAMSEY'S CANYON.—Mr. Jas. McGarey came in town last evening, just from Ramsey's canyon. He and partners have a number of claims there which make a fine showing. The ledges are large and well defined, carrying principally silver and copper. On the Central mine they are down 20 feet, and assays made recently give returns of $181.45 in silver. The copper glance carries $183.03 silver and about 70% of copper; this is a recent discovery. The Green Carbonate mine carries in silver $162.61 and 25% copper. Another late discovery is called the Gold Quartz, and carries gold and silver, principally the former, $17.11. Wood, water and grass are plentiful, the district in respect to these advantages being one of the most favored in the Territory. The veins give every evidence of permanency, and even if no increase is obtained in richness of ore in most of them a fortune is assured to the owners. W. E. Garrett, one of Arizona'e pioneers and an experienced prospector, is quite an enthusiast and feels that he is now on the eve of realizing upon his years of toil in the Territory. Considerable work is going on and there is not an idle man in the camp. Ben Williams, Esq., is there working a force of men on the Wisconsin mine, the sale of which was lately mentioned as being made to an incorporation of Eastern men and our own citizens. We understand that $25,000 has been set aside for the erection of furnaces.—*Tucson Record.*

A NEW ORE BREAKER.—There is being erected at Maltman'e sulphuret works near Nevada City a Forster combined ore crusher and pulverizer, which arrived Sunday from the manufactory at Pittsburg, Pa. It will be ready to start up next week. It is an exceedingly simple piece of mechanism, but to the eyes of a casual observer appears to possess those features so long sought for in connection with dry crushers. Geo. G. Allen of the Nevada foundry is agent for the Pacific coast for the machine. The one received will be in operation next week. If it proves a success, Mr. Allen will probably begin the manufacture of them, the cost of transportation across the continent being too great to admit of their introduction otherwise. The whole affair is very compact, being only six feet in length. The manufacturers claim that the different sizes will break and pulverize from one to three tons of ore per hour.—*Nevada Transcript.*

USEFUL INFORMATION.

Judging about Sizes, Distances and Hights.

Every observing person must have noticed that our judgment in regard to the size, distance or hight of objects is often erroneous, in case we are not familiar with either of them. Usually it is an under-estimate—that means, we think the object smaller, nearer, or lower than it really is, and this fact explains a great many peculiarities which have been the subject of dispute. Such as why the moon looks larger when near the horizon than when high up in the sky. The reasons of this and many other illusions about size and distance are as follows:

Man is accustomed to move on the earth's surface, and in this way trained to judge about distances and sizes as long as they are seen in a horizontal or nearly horizontal direction. But as soon as they are seen far above or deep below, he is at a loss to judge, and more so if no intermediate object furnishes him a scale to judge by.

A man of ordinary hight, say 5½ feet, is, at a distance of 315 feet, seen under an angle of one degree; and when he is on the ground, in a horizontal direction from us, so that we can judge of his distance according to our experience, he will appear of ordinary size; but if he is seen under such surroundings as to make him appear farther off, he will appear taller, as experience has taught us that when a man is farther off than 400 feet and seen under an angle of one degree, he must be above the ordinary size. We judge, as it were, instinctively about this, without thinking about actual distances or angles of one or more degrees. Place this same man high up on a tower or other elevation, without changing his distance of 315 feet from us, and we will no more realize the distance he is at, but under-estimate it by the absence of intermediate objects; and having the impression that he is nearer than he really is, he appears to us quite small, as experience has impressed us that a man must be uncommonly small when he is so near and seen under so small an angle. We do not think, and much less calculate about it, but judge by the more superficial impressions, because when we investigate and begin to reason about it the illusion disappears in most cases.

It is easy to give illustrations of this general principle. A flag, wind-vane or other ornament on a tower or other very high building, is always much larger than it appears from below. Very few people believe that the arrow serving for a wind-vane on the postoffice, New York, is 16 feet long; the men working at the suspension bridge over East river look surprisingly small to such persons as are unaccustomed to see very elevated objects. The Palisades along the Hudson river are always under-estimated in regard to their hight by those who see them from a distance and do not realize the great width of that river; they therefore judge them to be, say, about 100 to 150 feet high, but when their attention is called to the two and three-story houses at their base, and which they at first think to be dog kennels, they have a base of comparison, and at last recognize that the hight must be 400 or 500, and in some places 600 feet, a hight which is only fully recognized when ascending one of the pathways leading to the top. Some of the most striking illustrations of this illusion are found along the banks of the river Rhine, in Germany, where in some of the colossal quarries, the men at work look like mere pigmies, for the simple reason that the distance of the mountain is under-estimated, and consequently its hight, and also that of the men.

A SELF-LEVELING berth, is the new name given to a novel device, which the inventor thinks will do away with sea-sickness to the person who occupies it. One of these devices is about to be tried on a steamer from New York. A paper of that city speaks of it as follows: A few days ago a company was invited to visit the *City of Alexandria*, in the harbor of New York, into which the new contrivance has been introduced. The spectators of its working were satisfied that it was a success. These berths are of the ordinary size. They are attached both above and below to universal joints, and are weighted underneath by crescent-shaped cylinders of iron. This arrangement is designed to keep the berths perpetually level, no matter what angle the vessel herself may take. To further maintain the berths in their orbit, and prevent sudden changes of position, they are provided with spiral springs. It is said to be the intention of the company to which the *City of Alexander* belongs to introduce these berths into all its vessels. A few years since a ship was built in London with its entire cabin constructed upon this principle; but it proved a failure as a ship, met with disaster on its first trip, and was never tried as a test for the working of its self-leveling cabin, or the effects of that principle in avoiding sea-sickness. It is the opinion of the writer that the sea-sickness comes chiefly from the lifting and dropping of a vessel in a rough sea, and that consequently a mere self-leveling cabin or berth will have no effect in preventing sea-sickness.

A BUILDING OF PAPER.—The dome of the Troy Polytechnic Institute's observatory is 29 feet in diameter, and made of paper, reduced by pressure to the hardness of wood, and one-sixth of an inch in thickness. Its weight is only one-tenth of the usual material, and it is so nicely adjusted that a child can turn it.

HOW SHEET LEAD IS MADE IN CHINA.—The making of sheet lead for the lining of tea chests, etc., is a somewhat important industry of Hong Kong. It is made principally in sundry establishments to the westward. On entering one, workmen will be seen with shears busily employed in cutting out the sheets of lead into the required sizes and shapes. The shears are simply a large pair of sciesors, firmly fixed to a solid block of wood some two feet in hight. The lower blade of the shears terminates in a square piece of iron, instead of being pointed, as is the upper blade. The sheets of lead will also be observed to be of small size and somewhat irregular in shape, and this arises from the method of manufacture, as will subsequently be seen. Going further into the shop will be seen an iron pan raised 12 inches or so above the ground and carefully finished off. Beneath this iron pan is a furnace, and at the side of the pan next the wall is the flue communicating with it. In this pan the lead is melted, and when judged to be hot enough, the workman takes two of the large square paving tiles, which may be seen almost anywhere in the colony, and these are then smoothly and carefully covered with several layers of unsized paper. Having placed these two tiles before him, one above the other, the workman raises the upper tile with his left hand, and, taking a ladle of the proper size in his right, he dips it in the melted lead and then pours its contents on to the lower tile. He then drops the upper tile and quickly presses the lead out into the form of a sheet. The paper being a bad conductor of heat, the lead does not solidify immediately it leaves the ladle, and, as by long practice the workman always ladles out exactly the same quantity of lead, the sheets made vary but little either in size or thickness.

THE HUMAN EAR.—Imagine two harps in a room, with the same number of strings, and each string perfectly attuned to a corresponding string in the other. Touch a string in one, and the corresponding string in the other will give out the same sound. Try another string, and its corresponding tone will be sounded. So with all the strings. So with any combination of the strings. It would not matter how you played the one harp, the other would respond. No doubt the response would be weaker. That is what one would expect; but the response, as regards pitch and quality, would be almost perfect. Now, substitute for one harp a human ear, and the conditions would, according to theory, be the same, except that the responsive mechanism of the ear is much smaller than that of the responsive harp. In the ear there are minute chords, rods, or something, in such a state of tension as to be tuned to tones of various pitch; sound a tone, its corresponding rod or chord in the ear will respond, perhaps feebly, but still with energy sufficient to excite the nerve-filament connected with it; the result is a nervous current to the brain, and a sensation of a tone a particular pitch.—*Good Words.*

GOOD HEALTH.

SUGGESTIONS TO FAT PEOPLE.—No doubt it is unpleasant to be exceedingly obese; but the morbid dread of fat which has in recent years become fashionable, has, according to the London *Lancet*, no foundation in physiological fact. Fat answers two purposes; it acts as a non-conducting envelope for the body, and protects it from too rapid loss of heat, and it serves as a store of fuel. In the course of exhausting diseases it not unfrequently happens that the life of a patient may be prolonged until the reserve of fat is exhausted, and then he dies of inanition. Fats supply the material of the heating process, on which vitality mainly depends. In great excess it is inconvenient; but the external layings on of fat is no certain measure of the internal development of adipose tissue; much less does a tendency to grow fat imply or even suggest a tendency to what is known as "fatty degeneration." It is time to speak out on this point, as the most absurd notions seem to prevail. Again, it is not true that special forms of food determine fat. That is an old and exploded notion. Some organisms will make fat, let them be fed on the leanest and scantiest and least saccharine description of food, while others will not be fattened, let them feed with the most "fattening" of diets. The matter is one in regard to which it is supremely desirable and politic to be natural, adapting the food taken to the requirements of health rather than substance. Simple food, sufficient exercise and regular habits, with moderation in the use of stimulants, compose the maximum of a safe and healthy way of life.

SPRING DISEASES.—A very large amount of the discomfort, lassitude, depression and actual sickness which prevails in the spring can be modified or wholly avoided by the exercise of a little reflection and self-denial. One of the main objects of eating in winter time is to keep us warm, and to that end, provident nature gives a vigorous appetite in cold weather, but if as warm weather approaches we eat with the appetite of winter, the system not having time to adapt the appetite to the temperature, mischief will follow as inevitably as if a locomotive is diminished in speed one-half while the fires are kept burning as fiercely as when it was moving at the utmost allowed rapidity. A prompt diminution at each meal of one-third of the amount eaten in winter, beginning before April in the latitude of New York, and earlier further south, would diminish spring diseases to an incalculable extent.—*Ex.*

Women's Tendency to Obesity.

A year or two ago the New York *Times* started the question, Are not American women losing their thinness? and expressed the belief that they were losing it steadily and perceptibly. Observation shows that it is so, especially in large cities, where there is more ease and material comfort, more freedom from anxiety and petty care, than there can be in the country. Our women do not look as they used to 25 or even 15 years since. Their proportions have visibly increased, as most any one may see who will use his eyes. New York will serve as an example. Formerly, a really stout woman there was pretty apt to be a foreigner. Now, stout native women are very common, well-nigh too common to be agreeable. And round plump women of Anglo-Saxon blood and origin are conspicuously plenty. They are numerous on the promenade, at places of amusement, at private entertainments. Fullness of contour is no longer the dividing line between other nationalities and our own. We are getting more and more like the rest of the civilized world.

The pallid complexions, narrow chests, flat bosoms and angular figures of which we were wont to hear so much, are now hardly perceptible. They diminish every year, proving that the general health of the country is far better than it has been, and that we more clearly understand nature and nature's laws. The present danger is that women may acquire more adipose matter than may be attractive. The tendency is obviously in that direction. It may not be a great while before they shall compete in corpulency with their English, French and German sisters, not to name those of other lands. It appears to be the rule that women, in and after middle life, grow stout when they are comfortably circumstanced and mentally at rest; and there is no manifest reason why Americans should be an exception. We hope they will stop short of European redundancy (any degree of thinness is preferable to obesity), but whether they do or not, the meagerness of the daughters of the Republic is unquestionably a thing of the past.

IS SMOKING INJURIOUS?—The excessive indulgences in any appetite is injurious, but it has long been a question whether the moderate use of tobacco in any of the customary forms is attended with deleterious effects. Here is an item on this head that can be taken for what it is worth: At Yale college each class is graded in divisions according to scholarship, the best scholars being in the first, and so on down to the fourth, where they are rated "not too good," "yet good enough" to keep in the ranks. In the Junior class it was found that only 10 out of 40 in the first division were addicted to smoking; 18 out of 37 in the second; 20 out of 27 in the third, and 22 out of 26 in the fourth. The proportion of smokers, it will be observed, increases in regular ratio with the falling off in scholarship. The inference is against the smokers, but it is not certain that there are not other causes to account for the falling off in mental ability. It is not unusual for people to reform their vices as they grow older, and this might to some extent account for the advance in scholarship of the first division of the Yale junior class.

CLEAN BEDS.—A writer in the *Congregational* writes intelligently on this topic and on clothing as follows: "It must be a false idea of neatness which demands that beds should be made soon after being vacated. Let it be remembered that more than three-fifths of the solids and liquids taken into the stomach should pass off through the pores of the skin—7,000,000 in number—and that this escape is the most rapid during the night, while warm in bed. At least one-half of the waste and putrid matter (from 20 to 30 ounces in the night), must become more or less tangled in the bedding—of course, soiling it—and a part of this may become re-absorbed by the skin, if it is allowed to come in contact with it on the next night, as it must if the bedding is not exposed for a few hours in the air and light. We may well imitate the Dutch example of placing each bedding on two chairs near the window, in the sunlight; or in the window, that the best purifier known—the light of the sun—may dissipate their impurities, or neutralize them. At least three hours on the average is as short exposure as is compatible with neatness."

GLYCERINE IN DIPHTHERIA.—According to *Medizin Zeitung*, of Vienna, Prof. Clar's success with the use of glycerine in diphtheria admits of no doubt. He first prescribes a gentle aperient, either in the form of a manna draft, or of a few grains of calomel, which last he holds to be a powerful antiphlogistic remedy, and when properly used, of great value. Coincidentally he directs cold compresses or cloths to the neck and head, or even to the chest, carefully renovated according to the elevation or depression of the temperature, cold or iced water being at the same time given as a drink, and then commences at once the use of iron-glycerine, which consists of two ounces of anhydrous glycerine and 20 drops of the liquor sesqui-chloride of iron. Of this mixture, half a teaspoonful is given every half hour throughout the day and night. As soon as the symptoms appear to be mitigated, the quantity is diminished to a teaspoonful every second hour, and in the intermediate period, a mixture composed of glycerine two ounces, borax two grains, is similarly given by a teaspoonful at a time. The iron-glycerine is progressively given at longer periods, and is gradually replaced by the borax-glycerine.

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The Week.

Delightful weather has been the charming feature of the city dnring tbe week. From all parts of the State come the cheering news of a hounding activity on vineyard, and farm and in mining camp; and a prospect of a rich harveet of grain and fruit and an increased yield of gold from placer, gravel-bank and quartz vein, bas seldom heen better. Indeed, so auspicious is the season that the yield of the great products of our State bid fair to eurpass that of any former year. Some elight damage may be done to grain by the fierce "norther" which has hlown for two days, and extended along the coast several hundred milee and ewept over the hroad valleye of the State. The "norther" occurs regularly in May. It ie not an unmixed evil, and has been well characterized as a "fly. ing sanitary commission." The hot dessicating wind ahsorhe a vast amonnt of precious water, hut it also licks up and dries etagnant and miasmatic pools and thus removes the eource of diease and death. Rain may follow the norther, and canse some fluttering to the alwaye anxious baymaker.

It is a noteworthy featnre that mining operations over the entire Pacific slope are carried on with renewed vigor and intelligence, and our mining summary will he found full and interesting.

The most notable and the saddest event of tbe week was the fatal wrecking of an excurseion train on the S. P. C. railroad, on Sunday 23d inst., by which 18 persons were killed and 40 odd eeriously wounded. The cause of the disaster is now under investigation.

The proceeding hefore the Superior Court to impeach Mayor Kalloch for alleged misdemeanor, wae dismissed on Thnrsday, on the ground that the acts alleged were not done in his official capacity.

The shipments of bullion and the condition of the mining share market will be found in the proper columns.

Mining and Railroad Shares.

That there has heen and still is more or less prejudice among men in the Atlantic cities against mining shares, either as a means of speculation or as an investment, is a patent fact. The men who delight in ventures in railroad stocks, look with distrust on the shares of even the hest managed and successful gold or silver mining company. Why should this prsjudice exist among Eastsrn capitalists? Is there any inherent quality in the business of mining for gold, silver or copper; any peculiar ethics in the management of a gold or silver mining company, or in the manipulation of its stock, which renders it less securs as an investment, or the chances of profit in speculating in its shares less than in railroads? This prejudice is peculiar to American capitalists. It certainly does not exist in England, the center of capital, and our great commercial, manufacturing and mining rival; for her capitalists have sought for investments in the gold and silver mines of every country (ws hold a pretty sum of British cash on that account,) and the mining stocks of the world are quoted daily at the exchange in her capital. This prejudice must arise from habit. Eastern men are used to railway stocks; they are not used to mining stocks. Some thoughtless people say that there are fluctuations and uncertainties attending gold and silver mining operations and ventures in mining ehares which do not attach to the railroad business; hut a little time devoted to a comparison of the two enterprises, hoth as regards their ahility and profitable results, would not sbow to the disadvantage of mines and mining eharee. What is the present condition of the railroad etock market? Have its fluctuatione and uncertainties ever been eurpassed hy the mining etock market? The railroad stock market, remarks the Boston *Economist*, "is evidently in a had way. After nearly a year of inflated prices, reaction has come, and for weeke the papers have heen talking ahout the great depression, as if it was some sort of geological or atmospheric phenomenon. The fact is, the market is flat—not alone hecause it is hammered so, but hecause it has been found impossihle longer to sustain the prices of last autnmn and winter. In view, then, of thie general collapse along the line of railroad stocks, would it not he well for investors to turn their minds to mining securities? Here ie an almost fresh field for investment or speculation, which, with a yearly bullion product of $100,000,000 as a hasis, and securitiee selling at one-half or two-thirds their actual value, ought to be a tempting one.

Bad Timbering.

It behooves miners to he as carefnl ahout timhering while only opening their mines, as when everything ie in good working order. After a mine has been partly opened, but insufficiently timbered, if new people take hold of it they must, to put tbe mine in proper shape, retimber it. Mine owners wbo allow otbers to work under a lease, sbould look sbarp after them in this respect, for they almost always have the eole ohject in view of working out a pocket, and getting the money as eoon as possihle, rather than looking for future developments.

Capitalists don't run very hard after a mine in which it will he necessary for them to replace every timher hefore getting any returns, or heing ahle to work the mine systematically. Judicious work in timhering is a very important conederation. These facts are just heginning to he realized in eome localities. The Georgetown (Col.) *Miner* says that if all the profitable mines in Clear Creek county had been timhered on the same hasis as the Freeland, onr mining interests would have presented a very different aspect at the present time. It is nseless to conceal the fact that amid a general desire to accumulate wealth rapidly, without the least considerathone of suhsequent development, the timbering of eome excellent mines in this locality has heen sadly overlooked. The consequence is that a number of minee which have yielded handsomely, and would continue to do so with proper development, are now dormant from the fact that an enormous expense would he incurred hefore they could he placed in a secure condition for further workinge.

THE HOARDING OF SILVER.—The pressure of the silver hoard in the vaults of the National treasnry must, it would seem, find further scope before long, either in additional vaults or in the stream of husiness and commercial activity. On the 22d inst., Secretary Sherman sent to the House of Representatives a letter from Assistant Treasurer Hillhouse, at New York, giving the information that tbe additional amount of silver he can receive will not exceed $10,000,000, which amount, added to the eum on hand, would give a total of $28,000,000. The silver now in the vaults of the treasury at New York weighs 500 tons. Mr. Hillhouse adde: "I take the liherty of calling your attention to the matter, as there seems to he no disposition on the part of Congress to etop further coinage of silver. If it is to go on at the rate of $2,000,000 a month, the question of how we are to dispose of it with our present facilities will soon he a pressing one."

Arizona.—No. 5.

The principal tributary of the Colorado is

The Gila

Which rising in New Mexico flows westerly in a devious course of npwards of 400 miles until it joins the Colorado at Yuma, thus dividing ths Territory into two unequal portions. At various points along its course, notably at Florence, are considerahle tracts of rich agricultural lands which have yielded abundant crops wherever they have hsen brought under irrigation.

The chief conflusnts of the Gila are ths San Pedro on the south and Salt river on the north, the former rising in Sonora and flowing northwesterly about 130 miles, empties into the Gila ahout 40 miles ahove Florsnce. Although ths lands along its horder are not anywhere excslled in fertility, thsy are especially noted for the prevalence of a species of fever and ague which for a portion of the ysar almost prohihits ths presence of white residents. It is believed, however, that the disease is here especially virulent on account of the heavy growth of indigenous canss, gourd vines and willows, and that it will gradually disappear as thess are rooted out to make room for wheat fields and orchards.

The Salinas

Or Salt river is especially interesting in view of the facts that it drains a most prolific mineral region and that its agricultural lande are the most extensive and important of any in the Territory. It is so named becanse of the hrackishness of the lower portion of its etream, caused hy several groupe of ealine springs which are located and discharge iuto it at various points along ite course, the principal of them being oppoeite the northern hase of the Apache mountains. The salt in this stream ie not found to he in the least prejudicial to ite use for irrigating, while those accuetomed to drinking it prefer it to any other.

This river runs nearly due west and is formed hy the junction of a numher of streams draining the plateau region of northern Arizona. The chief of these are Black river, with Bonita fork, White river—rising in the White mountains—Carrigo, Cihicu, Canyon and Cherry creeks. West of these comes Tonto creek, draining Tonto basin, a promising mineral region, and finally the Rio Verde, a considerahle stream from the northern mountains.

The foregoing northern confluents of Salt river have longer courses and drain a larger country than do Pinal, Pinto and other southern tributaries. From the mouth of White river to Pinal creek, a distance of some sixty miles, tbe river flows through hox canyons; it tben widens out, forming a considerahle and quite fertile valley running down as far as Tonto creek, ahout 12 milee immediately helow which it is again confined in a very rugged canyon formed by the juxtaposition of the main peaks of the Superstition mountains on the eouth and a prominent cluster known as the Four Peake on the north. Thence released it flows on through an improving section to the thriving settlement of Tempe, receives the waters of the Verde, smiles on the fields of Phœnix and reacbes the Gila.

Other trihutaries of the Gila are San Carlos creek, rising in the White mountains near the Black river, and uniting with the Gila at San Carlos, the head-quarters of tbe Apache reservation, Aqua Fria creek, which, flowing likewise from the north, joins tbe main river at the northeastern angle of the great hend, near the confluence of Salt river, and Haseayampa creek, also from the north, its mouth at the northwest angle of the great bend of the Gila. The two last creeks, running, respectively, west and east of the Bradshaw mountains, drain the mining region south of Preecott.

The Santa Cruz river rising in Sonora, and the Sonoita and Sopori creeks, drain the region of the Santa Rita, Patagonia, Atascosa, and other mountains south of Tncson, and their valleys contain much fertile and some wooded land. Notwithstanding the confluence of some other creeks, the Santa Cruz sinks and is lost in the plaine a few milee northwest of Tucson, hut is supposed to run underground in a northwesterly direction from thence to near Maricopa Wells, on the Gila.

The larger portion of the minee hitherto developed, and the most important agricultural districts, are situated upon the Gila and its confluents.

For more than a hundred milee north of the Gila, the arid plaine of Arizona are nnwatered hy a eingle permanent river. The Bill Williams fork which joine the Colorado at Aubrey, is formed by the junction of the Big Sandy from the north, and the Santa Maria river and Burro creek from the northwest, and in its lower course rune parallel with the Gila. The remaining confluents of the Colorado belong to the plateau and canyon region of northern and northeastern Arizona, and are Kanah Wasb from the north, and Cataract creek and the Colorado Chiquito from the eoutb. The latter, a considerahle river, with numeroue affluents, has its head-waters in the White mountains near those of the affinents of Salt river, and is hordered in its uppsr course by land sufficiently fertile to entice numerous families of Mormons and Gentiles to eettle thereon. Its course is southeast to northwest, and it is more than 200 milee in length.

Description by Counties.

In order to give a hetter idea of tbe extent and varied character of the conntry, a short description of eacb county, including a sketcb of its towns and settlemsnts, and hrisf mention of its chief mines and lsading agricultural resources, will he given.

Arizona is divided into seven countiss—Yavapai, Apachs, Mohave, Yuma, Maricopa, Pinal and Pima. Its principal towns ars Tucson (capital of the Territory and of Pima county), Prsscott (for a sbort tims tbe seat of govsrnment of the Territory, and the county sest of Yavapai), Phœnix, Yuma and Florence (the county seats of Maricopa, Yuma and Pinal counties respectively) and ths new mining settlement of Tombstone, in Pima county.

Extensive plscers exist in the Santa Rita mountains, and over large areas in the western part of the country, notably in the vicinity of Gila City. But the difficulty of introducing water has hitherto prevented their bsing worked, excspt in a small way hy Indians and Mexicans, hy dry washing. A company, recently organized in this city, is now engaged in experimsnting with a dry washing machine on the gravsl nsar Gila City with the most flattering prospects of success. Should any means of handling profitably in a dry way the auriferous gravsl deposits of the Territory bs devised, enormous increase of the bullion product would he the immsdiate result.

Pima

The greater portion of southern Arizona is included in Pima county, which runs northward to the Gila at its eastern extremity, but for most of ite length is eeparated from that river hy Pinal and Maricopa counties. Its weetern extremity ie somewhat eimilar to the Gila bottom, hut its central and eastern portions are mountainous. Its chief rivers are the San Pedro and Santa Cruz; its chief valleys those of these rivers, and the Sulphur Springs and San Simon valleys. In this, the most populous county, are the oldest as well as most of the newest mines of Arizona; and the oldest and newest of the large towns. The valleys, especially those of the San Pedro and of the Santa Cruz, are very fertile, aud the mountains hear a tolerahle supply of timher. The mineral resources of the county are enormous and varied including gold, silver, copper, lead, coal (at Arivaipa canyon), salt, gypsum, etc.

The oldest, largest, and in many respects most interesting of Arizonian towns, is Tucson, formerly the Presidio de Tuquisou, founded certainly not later than 1769, and, according to some accounts, older than New York. The valley around is said to have been eettled in 1560. Tucson, the capital of the Territory, is situated upon the Santa Cruz, and probahly now contains about 8,000 people, a large proportion of whom are Mexicans. The streete are narrow, and the houses, except the more modern ones, are one-story adohes, while tbe Mexican part of the population is to a great extent picturesquely dirty and thriftless looking. The Mexicans ehow little of the pure Spanieh type, having the hroad, red face, which speaks of Indian blood. Now that the railway is opened, population is rapidly pouring in from California, and much of the merchandise comes along the railway. Previously all merchandise came over the horder from Sonora, a far more practicahle route than across the Colorado desert from California.

South of Tucson, and etretching thence eastward is a considerahle tract which for more than a bundred years has heen cultivated hy the Papago Indians. Some of the farms have heen continuously worked during tbe whole of this period, and as yet sbow no signs of exhaustion, producing two crops every year.

Oranges, lemone, figs, almonds, and all the fruits and nuts of the tropics and semi-tropios can be grown here. Water is obtained from the Santa Cruz river, and, where this is not available, by sinking artesian wells. Within the Papago reservation, and about nine miles from Tucson, etands still in tolerahly good preservation and used for divine service, the old Mission San Xavier del Bac, one of the three founded hy the Jesuite for the conversion of the Indians.

The Papagos, who reside in southern Arizona and northern Mexico, are a superior tribe of Indians; and those who were converted hy the Jesuit fathers etill remain faithful to the Catholic church, and have besn hy their hravery and trustworthiness the chief hulwark of the town of Tucson against tbe treacheroue Apache. They numher ahout five thousand. The valleys south of Tucson are fertile, and the mountaine wooded. Besides the valley of tbe Santa Cruz there ie the Sonoita valley, twenty to twenty-five milee long, and covered with a heavy growth of timher, ash, cottonwood, etc. Orchards succeed well in thie valley; apples, peaches and pears have heen planted, and thue Tncson can he supplied with temperate as well as with tropical fruits. Hay-ranches and gardens extend for some miles along the road from Tucson to Mariposa.

GROWTH OF YOUNG PINES.—It is encouraging, says the Reno *Gazette*, to observe that quite a thrifty growth of youngpines is springing up on the mountains between Steamboat and Virginia. In most places they have attained a hight of 20 feet. Higher on the sides of the canyons they grow more slowly, and gradually dwindle in eize and numher until, at a line about 7,000 feet ahove sea level, they disappear almost entirely. There are very few cedar or fir shoote coming up. These mountains were covered with trees 20 years ago, but all bave disappeared, and even the etumpe and roots have been grubbed np by the Italians and Chinamen.

Hydraulics.

(Written for the PRESS by A. MYERS, Hydraulic Engineer.)

The subject of hydraulics is of greater importance to this coast than perhaps to any portion of our Union. First, because of the scarcity of water during a large portion of the year; second, because of the great altitude of the majority of the falls of water, and thirdly, on account of the value of the enterprises usually employing this branch of engineering.

On account of the scarcity of water during a large portion of the year, many of our mills and factories are compelled to use steam power a part of the year, whereas if they understood the best methods of applying water and employed the most economical hydraulic motors they would be able, in many instances, to dispense with their engine altogether, or at most not be required to use it more than a few months. The use of water as a motor has not been studied as a science generally, but those having water power have accepted most any suggestion that had been first proposed without investigating its merits or ascertaining the facts concerning its highest utility.

Men have jumped at conclusions, hence many of otherwise promising enterprises have proved disagreeable and expensive failures. All this has resulted from absolute ignorance of the science of hydraulics. We mention two instances of such examples that have come under our observation:

A wealthy company determined to build a flour mill on a valuable water power in a growing young city. They were assured by, as they supposed, competent judges that they had ample power and fall to drive at least five run of burrs and all the machinery necessary for a flour mill of that capacity. They employed a first-class millwright, as they supposed, who, by the way, was a member of the Legislature from a distant county of the State, and of course he ought to know. His plans were approved and the building commenced. Other millwrights were employed, consultations among men were frequent, but as is customary among mechanics the work was done according to order. The building was erected, and as it had been all *fitted together first*, it came together after some few alterations. The machinery was ordered from the East, and the manufacturers of the burrs were ordered to make one burr for each set to run one way and the other the opposite way for the other side of the same shaft, for each shaft was to drive two pair of burrs. Also a new and improved dress was required to be put into two pair of the burrs—*an idea* of the boss builder and contractor. He would not order the water wheels from the East, for he had an "*idea of his own*," and he could make as good water wheels as ever were made. Four 48-inch wheels were made and brought to the mill. An old millwright who saw them before they were put in the penstock, said "that there would be no harm to worship them, for there was nothing like them in heaven above or in the earth beneath." Previous to their construction a young hydraulic engineer had met the boss and tried to show him that the wheels he was building would not do, and to convince him of the fact made a calculation to show him how much water each wheel would use, and concluded that each wheel would use more water than there was in the race, and that each wheel would only make so many revolutions under the head. But he *knowed* better. After the conversation was over he slipped the paper into his vest pocket, for on it was a calculation he did not know how to make, and that was to get the revolutions of his wheels under the head.

When the wheels were put in *the mill would not go!* The water all ran through one wheel, and all that vast mill was a stupendous failure. The burrs had to be redressed at the mill; one new wheel was purchased the same size as the other four, and it drove all the mill and made a success of it; but not without immense loss to the company and until a competent millwright took hold of the job, and the former member of the Legislature was sent home to brood over the misfortunes of unappreciated genius.

The other was a case where the parties wished to erect a 20-stamp quartz mill. They had 115 feet fall of water, and ordered by telegraph a 30-inch wheel. The water was to be conveyed to the wheel by a *six-inch pipe*. The party of whom the wheel was ordered happened in the neighborhood, and on inquiry found out the conditions of the water power, and succeeded in convincing the parties that their millwright had made a great blunder, and ordered a wheel very much smaller in size and a pipe ten times the capacity of the previous one, and the mill was a success.

Necessity of Care in Calculations.

Where care is used in investigation of the actual value of the pounds of power in any given mill privilege by a competent hydraulic engineer, no risk at all need be run to secure absolute success in the enterprise.

There are, however, many on this coast who claim to know all about hydraulics, and will give their opinion about the merits of this or that proposition who cannot in a dozen months calculate the spouting velocity of water under a sixteen-foot head, or tell by calculation how many revolutions any sized water-wheel would make under that head. But their opinion is based on something they once saw or heard some one tell about. No man is a competent millwright who cannot make the calculations necessary for his work. He who cannot is only a jour. and no mechanic. Where water is scarce the exact facts ought to be known. First—What is the hight of fall that can be secured in fact? Second—What is the actual number of cubic feet of water per minute? This will determine the actual horse power that can be depended on, and will determine the capacity of the mill to be built. Or if the quantity of water is variable, then what is the smallest quantity at the lowest stage of water and the opposite items? Then build to suit the circumstances.

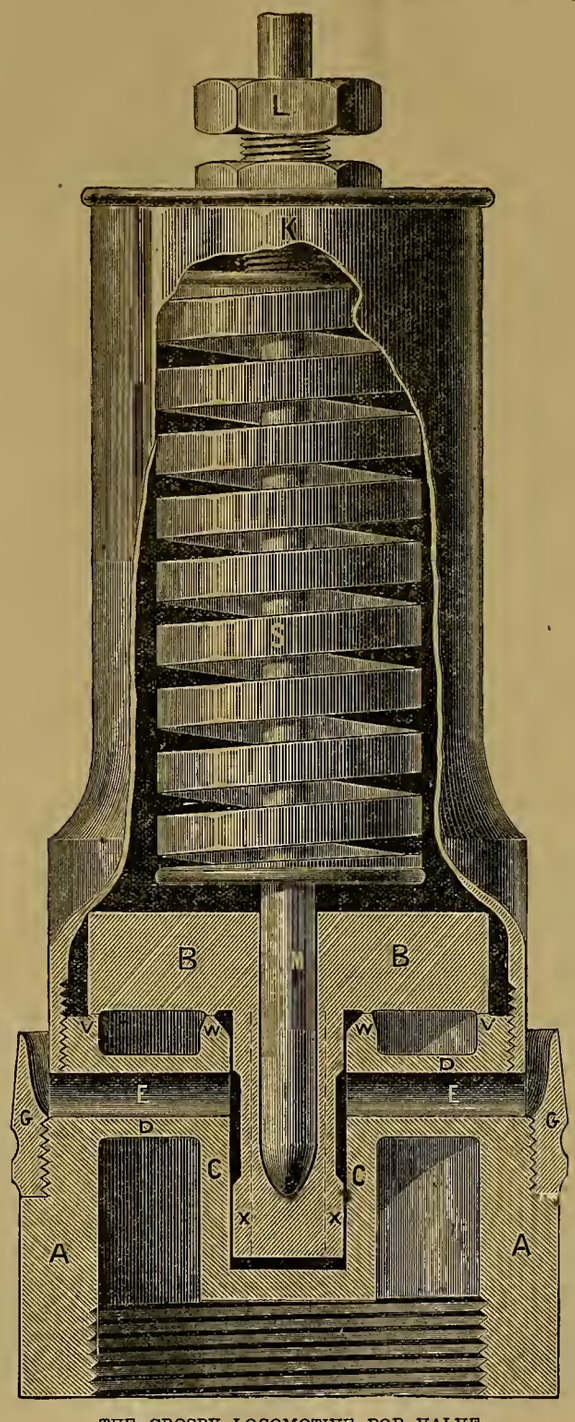
If the lowest or smallest quantity of water is determined, then a mill of that capacity can run all the time, and if a sufficient quantity can be secured to increase the capacity, and it will pay to build for part of a year's work, then build in view of that fact. Where water is scarce and the fall moderate or high, no flumes should be constructed at all, but iron pipes used, which are cheaper than any flume, the size and capacity of which could be determined by a competent engineer. This is of vital importance. None but one of experience can direct in this matter without jeopardizing the success of the enterprise.

The Altitude of Falls is Often Wonderful on this Coast.

There are hundreds of small streams in our mountain regions flowing from great hights, and often, in a distance of one-fourth to a half mile, fall a hundred feet or more. All these streams afford wonderful water power, and are allowed to run to waste for want of a proper knowledge of their value. As a general thing any quantity of water that will flow through a box one foot square, with an ordinary grade of one-fourth of an inch to the rod, will yield a handsome power, if conducted to a reasonable altitude. For instance, such a quantity of water under thirty feet fall will give about ten-horse power and drive a small country mill, or will give sufficient power for a five-stamp quartz mill. Said water conducted to 100 feet fall will give over forty-horse power, and so on to various hights. But all these facts should be submitted to a competent hydraulic engineer. In general, civil engineers have not sufficient information on hydraulics to give an intelligent answer to the questions which enter into these calculations.

Most civil engineers are lamentably ignorant on hydraulic subjects. There is more to be realized from special application to one part of an occupation than can be expected from one who possesses only a general information in regard to the whole of it.

Enterprise on this coast costs money. On account of our distance from the centers of trade, we are compelled to pay high prices for all kinds of machinery, as well as high rates of wages for all kinds of skilled labor, thus making enterprises on this coast, which, under ordinary circumstances, would be but light here, cost a small fortune. Hence when these enterprises are begun, if due care is observed in all the appointments, success may reasonably be expected, otherwise a vast failure, and a struggle for years to repair the damage. Incompetent persons will give advice when none of the essential data are at hand to determine what may be the results. Every man should be able to give a reason for his opinion, and that based on figures which will not lie.



THE CROSBY LOCOMOTIVE POP VALVE.

Hydraulic Difficulties.

When the hardy miner discovered that water was essential to the mining industry, to the vast majority of them it was a new element to deal with, and little was known of its merits or the difficulty of handling it. Consequently their inexperience gave them untold troubles and expense. To wash gravel in an ordinary rocker or sluice box there was no difficulty, but when they began to want it applied for hydraulic mining that was another thing; heuce, curious and wonderful were the devices employed. Soon it was discovered that water led to an elevation and conducted through pipes could be made effective, but how large and how strong was not thought of. Necessity required them to get on with as little expense as possible; hence their pipes were small in diameter and of light iron. The pressure was sometimes considerable, but their work was, they thought, effectual. Not knowing their losses, they thought they were doing well. Their pipes were soon destroyed and new ones required before those had been paid for.

Necessity and experience taught them better. Soon men of more knowledge and scientific skill showed them their error, and proposed very much larger pipes and very much stronger ones.

These were adopted, and the results were wonderful. More than ten times the force was added to the jet of water, and tons of ground were sluiced where pounds were before. Rocks of enormous size were caused to roll away from in front of the nozzle of the "little giant."

[To be Continued.]

The Crosby Locomotive Pop Valve.

We give on this page an engraving representing a full sized (2½-inch) Crosby adjustable pop valve, as designed for locomotive use. Each of these valves is tested under steam pressure and set to open at the exact point desired, and is adjusted to close at about two pounds reduction ordinarily. Both of these points can be readily changed without removing it from the boiler or reducing steam. The following explanation will make the working of the valve easily understood: The valve proper, *BB*, rests upon two flat annular seats, *VV* and *WW*, on the same plane, and is held down against the pressure of steam by the steel spiral spring, *S*. The tension of this spring is caused by screwing down the threaded bolt, *L*, at the top of the cylinder, *K*. The area contained between the seats, *W* and *V*, is what the steam pressure acts upon, ordinarily, to overcome the resistance of the spring. The area contained within the smaller seat, *WW*, is not acted upon at all until the valve is open. The large valve, *VV*, is formed on the upper edge of the shell or body of the valve, *AA*. The smaller seat, *WW*, is formed on the upper edge of a cylindrical chamber or well, *CC*, which is situated in the center of the body of the valve, and is held in its place by four arms, *DD*, radiating horizontally at right angles to each other and connecting it with the body of the valve. These arms are hollow and form four passages, *EE*, for the escape of the steam or other fluid from the well into the air when the valve is open. This well is deepened so as to allow the wings, *XX*, of the valve proper to project down into it far enough to act as guides. The area of the apertures, at the outer ends of the passages through the arms, is reduced more or less at will by screwing up or down the adjustable ring, *GG*.

When the pressure under the valve is within about one pound of the maximum pressure required, the valve will open slightly and allow the steam to escape under the larger seat into the cylinder, thence into the air; the steam is also forced under the smaller seat into the well and thence through the passages in the arms into the air. When the pressure attains the exact maximum point the valve is lifted so as to force the steam into the well faster than it can escape through the apertures in the arms. A pressure will then accumulate under the inner seat in excess of what is required to overcome the resistance of the spring and at once forces the valve wide open and relieves the boiler. The valve there at once slowly settles down and so continues until the area of the opening, under the inner seat is smaller than the area of the apertures in the arms for the escape of steam; the pressure then ceases and the valve promptly closes. The points of opening and closing are easily adjusted; the former by screwing the threaded bolt at the top of the cylinder either up or down, and the latter by screwing up or down the ring surrounding the outside shell or body of the valve. Messrs. Parke & Lacy, 21 and 23 Fremont St., are agents for the valve for this coast.

REVIVAL OF MINING.—All signs in New York city, says the *Mail*, indicate a speedy and great revival of mining interests. We observe that there is a steady increase of private companies. There are over a hundred good mines held in this city, which are being mined and developed as investments and properties. For convenience the owners have incorporated them, but the stock is not obtainable. This fact is a gratifying one, as it shows clearly that the prejudice against mining as a legitimate business pursuit is vanishing utterly.

Globe District.

At no time since the creation of the world has Globe district shown such evidences of thrift as now. Every where is heard the sharp clink of the resounding hammer and drill head, and detonating Hereules and Giant powder as it veins the throbbing air with glittering and somber precious metals. All are happy, and no truthful miner who rcalizes that he has a soul to save will say, "I hold over you Pard."

We have heen puzzled to know why it was that Providence, in His beneficent wisdom, made his plant here pay from the grass roots down, and will still be at a loss to know why it is that Globe district is more favored in that respect than any other bonanza district in America, unless it was His knowledge of the fact that citizens of the district would erect a M. E. chureh that would comfortahly seat a thousand. Every camp of the district is filled with light-hearted miners, who know that the good time is near, and others have fixed the date when fortunc will smilingly come with hoth hands full and release them from hegrimmed lahor, and throw an old shoe after them for luck, as they go their several ways to greet the girls they left behind them; others who had given bonds to society, by taking a wife, hefore leaving the happy haunts of men, where they sometimes see a circus, will, in their heart of hearts, bless the "plant" and guiding star that led them hither where they so quickly filled their cornucopias, not for themselves alone, but for the comfort and gratification of those who are dearer to them than all the world besides. Globe district is a great big "dimple in the mountain," and until recently has heen *a terra-incognita* except to pioneers who would hreast a mountain trail, no matter how steep or long, to satisfy the truth or falsity of a whisper that their efforts would be rewarded hy discoveries of rich ledges. or pay dirt in placer diggings, "just over there." To such men the world owes its knowledge of the existence of this great mineral helt, and for finding passable roads into it, and establishing short paths to school. Without them there would be no railroad loop like that between Kern valley and the Mohave desert to point to as exhihitiog "a remarkable triumph of engineering science." Their discoveries created the necessities for railroads, the steam engine and quartz battery; they cleave and tunnel mountains, precede science, and open the way for the mechanic and artisan; and while parting the fringe of civilization preparatory to another step in an unexplored country, they are bnt seeking another jewel to place in the diadem of eivilization. No one of this class were more courageous or deserving of their country's merited regard than W. A. Holmes, William Hope and others of the first that made a halt, a camp and a mining location in (now) Globe district. —*Silver Belt.*

THE "GEM" GOLD MINE.—This property is situated ahout three miles from Pinal city, in the Queen canyon, with a good road almost to the mouth of the tunnel, and is part of the Wideawake company's property. The explorations consist of a tunnel of 300 feet, the ledge showing a width of five and one-half feet in the tunnel. A cross-cut is beingrun to the main ledge which shows ahout 8,000 tons on the surface where the vein crops out five feet wide, averaging $50 in gold. The Wideawake prospecting and mining company have now operated in Pioneer district for the past three years, and have during that doubtful and often stormy period, never failed to pay their hands, which we regret to say has not always been the case with companies. They have now a magnificent property, which is evidently appreciated on the San Francisco Stock Exchange—the shares having risen from 7 cents to $2, within the past year—and a further rise may be confidently looked for on the erection of reduction works. Although no free gold whatever has yet been brought to sight, the ore has proved, on assays, to contain from $50 to $852 in gold, and $133 in silver. On striking the main ledge, the San Francisco gentlemen, who constitute the company, will certainly erect a mill, the site for which is within 100 feet of the mine.—*Pinal Drill.*

EDISON'S LATEST.—Edison proposes a still bolder scheme. He would insulate the track, "on tar, rubher or something," and pump the electricity into it from engines placed say ten miles apart. From the charged rails the mysterious fluid would pass through the driving wheels to the machinery and after doing its work escape again to the rails. He believes that he can thus "drive a train 25 miles an hour over an uneven country, without grading the road bed at all, and he estimates the cost of a light road of this character at about one-fourth that of the average narrow gauge road. This sounds like a wild statement, but who knows what science may yet accomplish?

BULLION TAX.—The following is the tax return of hullion on the mines of Lincoln county for the quarter ending March 31st, 1880:

Great Eastern S. M. Co.	$ 38.46	$ 1.31
Brisacher & Co	179.92	6.12
Meadow Valley S. M. Co	805.42	26.38
National mine	96.50	3.28
Queen of May mine	95.10	3.23
Raymond & Ely mine	4845.02	164.73
Unknown mine	667.00	22.70
Valley M. & M. Co	980.00	33.32
Volcano mine	145.70	4.95
Raymond & Ely, tailings	105.00	3.57
Total tax		$260.59

RAILROAD ASSESSMENTS.—In Sacramento county the railroads are assessed by the State Board of Equalization as follows: Central Pacific, $830,724; California Pacific, $8,005; Amador Branch, $199,500; Sacramento and Placerville, $330,688. In Amador: Amador Branch, $84,000. In Butte: Central Pacific, $911,880; California Northern, $107,794. In Calaveras: Stockton and Copperopolis, $8,837. In Colusa: Northern railway, $600,760. In El Dorado: Sacramento and Placerville, $208,413. In Nevada: Central Pacific, $612,986; Nevada County Narrow-Gauge, $188,826. In Placer: Central Pacific, $2,284,766; Nevada County Narrow-Gauge, $37,403. In Shasta: Central Pacific, $380,963. In Sierra: Central Pacific, $43,567. In Solano: California Pacific, $640,462; Northern Pacific, $221,367; Vaca Valley, $188,600. In Sonoma: S. F. & N. Pacific, $1,066,533; North Pacific Coast, $146,959. In Sutter: Central Pacific, $202,640. In Tehama: Central Pacific, $821,502. In Yolo: California Pacific, $496,358; Northern railway, $270,995; Vaca Valley, $107,025. In Yuha: Central Pacific, $321,589; California Northern, $89,208.

THE *Inyo Independent* gives the following approximate altitudes of the various places named, in feet above sea level: Virginia City, Nev., 6,026; Aurora, 7,765; Bodie (Maine street), 8,500; Caudelaria, 5,842: Columbus, 4,922; Silver peak, 5,014; Summit between Silver peak and Lida, 7,682; Lida valley, 6,486; Buster mine, 8,072; Fish Lake valley, about 5,600; Gilbert's ranch, Deep Spring valley, 6,150; Summit pass on the White mountains between Deep Spring and Big Pine, 8,900; Owens River hridge, near Big Pine, 4,416; Independence, Inyo county, 4,000.

IN 1849, when gold was discovered in California, there was not hetween the Missouri river and the Pacilic ocean, or from Manitoha to Sonora, over 25,000 persons of Caucasian stock, and not-3,000, all told, speakingin English as the tongue of their nativity. Now there are 3,000,000 persons in the same area; there are 10,000 miles of railroad, and nearly twice that of telegraph; there is a property valuation of at least $3,000,000,000, six prosperous States and nine Territories, growing in wealth and population, now producing in the precions metals at least $85,000,000 annually, and also embracing the three largest wheat-growing States in the Union.

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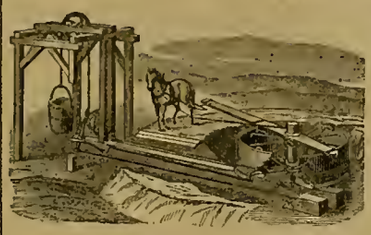

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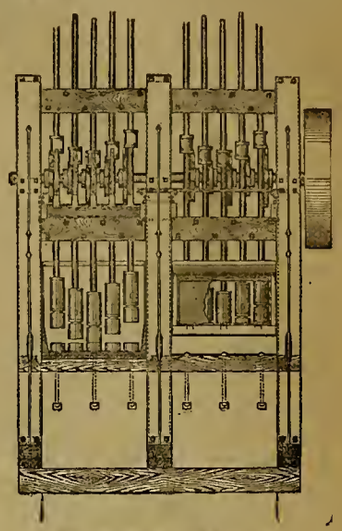

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Furnaces for chloridizing and desulphurizing ores.
Concentrating Jigs and Slime Machines for concentrating

Gold, Silver, Lead and Copper Ores.

Amalgamators, and plans for working ores by the various processes. Address

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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Office, No. 320 Sansome street, Room 10.

A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

J. S. PHILLIPS, M. E., ETC.

May still be consulted by old friends through P. O. Box 3051, New York.

METALLURGICAL WORKS,

STRONG & CO., 10 Stevenson Street, S. F.
ORES SAMPLED, TESTED, ASSAYED.

Mines and Mining in Tuolumne County.

EDITORS PRESS:—With tbe genial weather, an abundance of water and some oonsiderahle investment of outside capital, we have to report a rather active condition of affairs, and a generally cheerful outlook for the mining interests of Tuolumne county. During the past winter tbis industry languished, the deep snow and the cold weather preventing much work being done. But for this season of inactivity we hope to make up before the summer is over, operations on many quartz claims having this spring been commenced for the first time, while on othere they have been renowed or extended. Then, the plentiful flow of water, hesides filling the ditches and insuring a full supply for all, has afforded means for washing in . localities where only at long intervals any work could be done. Much gold will this year be gathered from the gulches hereahout that still pay good wages, as they could he worked only in seasone like the present when free water was to be had in ahundance. It looks now as if more gold would be taken out in Tuolumne this summer than during any summer for many yeare past. To particularize a little the following may be noted as indicating what is heing done here in tbe way of

Quartz Prospecting and Mining.

And, firet, it may be premised that we have bere, as in Calaveras on the north and Mariposa on the eouth, two quartz-bearing helts traversing the county in a generally north and south direction, and separated from each other by a space of ahout 14 miles. The most westerly of these systems, which carries the so-called Mother Lode and its attendant ore deposits, occurs mostly in the slates, while the other occurs mostly in granite, though the walls of both are in placee composed of these rocks alternately. Standing in or near the west-lying eyetem the most prominent minee are the App, Heslep, Silver, Harrie, Rawhide, Patterson, Waters, etc., the leading properties along the other bslt, if we extend it according to the view of most miners, being the Ferguson, Mt. Jefferson, Buchanan, Spring Gulch, Star King, Coneuello, New Albany, Eureka, Mastodon, Louisiana, Soulsby, Confidence, Hazle Dell, Evans, etc. There are, of course, many good quartz claims lying outside both thesc systems, it being open to question whether some of those above mentioned can, strictly epeaking, be considered as belonging to either. All, however, lie in or near the path of one or the other of these mineralized zones, partaking of the characteristics of that to which they respectively appertain.

The first quartz mining done in this county was on some of these claims located along the Mother Lode, the several enterprises here set on foot having met with varying fortunes. For the first few years these ventures, as was the case elsewhere throughout the county, were generally prosperous. Then ensued an era of embarrassment and stoppage, caused mostly by inexperience, prevailing high prices and imperfect machinery, which troubles were sometimee aggravated by an indifferent or perhaps a really bad management. This era of suspension and disaster covered a period of several years, after which things began to mend, and for the past year or two have heen all the while growing better. As evidence of tbis we have the fact that active operations have been, or shortly will be, resumed in nearly every case where they had been suspended.

Resuscitated Properties, Live Mines, Etc.

Without reciting every instance that might justly be classified under this head, the following examples will serve to ehow how much is being done and how general the resumption of quartz mining has of late been in Tuolumne county. The Confidence mine, after a brilliant caresr followed by a long interregnum, is again running its 40-stamp mill and making a monthly production of $80,000, which there is every reason to helieve can be kept up for a long time to come. Of the Ferguson mine, just over the line in Mariposa, very nearly tho eame may be eaid, except that the product made here is not quite so large. The Mount Jefferson, Spring Gulch, Star King, Coneuello, New Albany, Louisiana, Soulsby, Live Oak, Evans, and Riverside mills are all running, except perhaps one or two that may have shut down for temporary purposes. These mines, which are all on or near the easterly ore channel, are well opened up, have much ore in sight, and are outfitted with mills carrying from five to thirty etamps each. In the same channel are located a number of claims on which much work has been done and valuable ore developments made, and from some of which a great deal of bullion has in former daye been taken out. In this list is included the Buchanan, Eureka, and the Hazle Dell, on all of which mills were once put up and run with profit till affairs took an evil turn, caused by the exhaustion of the ore chute, influx of water, dissensions among owners, etc. Every one of these mines could, with a small amount of money, be put on a paying basis and for years be run with satisfactory results. Then there are here other mines, like the Lady Washington and Mastodon, that, having already been partially opened, could at little expenss be effectually explored, and with every prospect of developiug into remunerative properties.

On the Mother Lode

There has, in like manner, occurred some, thougb perhaps not quite so marked a revival of quartz mining, nearly every prominent claim there bsing now worked or prspared for active operations. Without pursuing the subject further in detail, it may he stated that, whereas, there were four years ago not ovsr half a dozen quartz mills running in this county there are now at least fivs times that number in successful opsration, some of those lately put up heing establisbmente of large capacity.

And the Cause.

That so many improvements could not have heen made and so much progress effected here in mining without the aid of money from outside sources, it ie needless to say. To this sort of assistance euch advancement of our mining interests has, in fact, been mainly due; the capital invested having heen mostly furnished by California parties. Some of it has, however, been derived from New York, Boston and a little also from England. There has been some money lost here in mines, but lese I helieve than in any other county in California. Be this as it may, of one thing I am sure, the investments made here in mining enterprises and properties of late, will prove safe and good ones. To this remark I do not think there are any exceptions. Among the Californians who have recently put in their money here will be found some of the most shrewd and cautious operators in the State. Thus far they expreos themselves as being more than satisfied, and I predict that there will for the next few years be more California capital invested in our home mines—more even in this county alone than in countries outside. And while parties on this ooast have generally fared so well here, other purchasere have had no cause for complaint, certain New Yorkers having gotten {hold of some especially good properties. An association styled the Boston and Pacific Mining and Investing Company, have also just consummated a bargain for eome mines in this neighborhood on terme that are here considered exceptionally favorable. I am not advised as to the full extent of their purchase, but know of my own knowledge that it includes several minee of unquestionable merit with others of very great promise. One of the propertiee secured by these eharp people ie outtitted with a mill and noted for carrying about tbe best grade of ore of any mine in the county. Some of the parties selling are already filled with miegivings, believing that they parted with their property for hardly a tithe of its value. But the buyers in negotiating th eir purchases enjoyed peculiar advantages, having for advisere men thoroughly familiar with the character of the minee here, while for all they bought they paid the cash or its equivalent. This company appears to be made up of live men who intend to open up and equip their mines in the beet possible etyle and run them for all they are worth. It is here believed that a great euccess awaits them. At any rate they in common with all other enterprising and energetic inveetors have the best wishes, ae they will always secure the hearty co-operation of every resident miner and well wisher of— OLD TUOLUMNE.

Sonora, Cal., May 25, 1880.

VINICULTURAL COMMISSION.—The meeting of the Vinicultural Commission held in tbis city on Monday results in permanent organization and preparation for work. A. Harasthy, of this city was cbosen President of tbe commission, and Dr. J. I. Bleasdale appointed Secretary. The commission is now coneidering tbe selection of rooms for a permanent headquarters in this city. Dr. Bleasdale has made a long study of the ecientific and practical features of viniculture and has occupied important positions as an expert in these matters in Australia. He is also familiar with the practices of the European vignerons. He is certainly possessed of experience and observation which qualify him for valuable work in the position to which he has been assigned by the commission. As yet the commission is but getting into ebape for action. We trust useful results of its labors will soon appear.

A PIONEER GONE.—We are called upon to announce the eudden demise of Cbarlce Green Gould a native of New Jersey. Mr. Gould passed away very enddenly, being sick only about a week. It was a forcible reminder of the uncertainties of life, ae it seems but yesterday eince he was pursuing his trade as carpenter in our office. Mr. G. left but few relations, his nephew (our mailing clerk) being the nearest in thie State. He was respected hy those who knew him as an honest and npright citizsn, and to his friends and relations there is a void left which will be hard to fill.

ACCORDING to the Truckee *Republican* nearly all the snow-shede between thie point and Blue Canyon will be rebuilt or repaired this summer. They have done service so long that the timbers need replacing. The work this time, we understand, will be made etronger and more capable of resisting the heavy fall of snow than tbe present sheds. It is a big job and will require the outlay of a large sum, but it will give employment to a large force of men. It will require an immense amouut of timber, and will help to make things generally lively bere.

THE Ophir ehaft will be cloeed about the 15th of June, at which time tbe mine will be in connection with tbe C. and C. shaft. Thereafter all work in the Ophir will be prosecuted through the C. and C. sbaft.

Ocean or Rail.

There is reported an increasing disposition among those bringing merchandise to this coast to patronize the car rather than the keel. It is said that by entering into contracts for exclusive overland transportation merchants can obtain low rates; which, in connection with the fact that they can save much time whicb would be consumed in a sea voyage, and thus sooner realize upon purchases at the East or ahroad, makes it a present advantage to them to ehip by rail rather than hy water. It is cbaracteristic of Californians to seize tbe present opportunity without much regard for future results or consequences, and this matter of all rail shipments eeeme to be a new manifestation of this disposition.

We are led to allusion to this suhject from the fact that our agricultural prosperity depends to such great extent upon abundant facility for ocean transportation. The cheap carriage of grain to the English and continental markets ie absolutely indispensahle to our prosperity as a State. Every shilling added to the cost of ocean freights ie a ehilling added to the cost of grain laid down abroad, and it is not added to the price obtained there, but ie taken from the reward of the producer for his labor here. Raise ocean freights and you lower the price whicb the shipper will pay our farmers. Wheat growing is a business upon a very narrow margin generally; it is a hnsiuess in which all quarters of the globe compete with us. If our meane of cheap transportation by sea are circumscribed or reduced in any way, we come hurdened to the contest.

It cannot be doubted that the tendency of our merchants to dispense with ocean carriage bither of the goods they purchase abroad, will make it impossible for ship owners to obtain cargoes for thie port which would pay them even in part for the inward voyage, and if they come here in ballast thie expense must be euper-imposed upon what would otherwise be a fair recompenee for the outward voyage. In other worde, as it appears, our wheat growers would have to etand the ship's expense for a round trip with the owner's profit added, instead of dividing this with the merchant who brings in goods for eale to our producers. Our grain growers cannot stand such an affliction. They cannot afford to pay what would be equivalent to the cost of doubling the distance hence to Europe, and than returning tribute for overland transportion of the supplies they require. This would be burning the candle at both ends. It ie hard enough to eustain a single illumination. The resnlt would be that the money which the farmer would receive for his crops would be less than the cost of production, and our grand producing interest which is now the backbone of our proeperity and progress, would no longer give livelihood to those who are laboring hard and untiringly for the modest measure of success which they now ohtain.

Ie argument needed to point tbe application of such truisms to the importers of merchandise who now seem prone to dispense with ocean carriage? It is necessary to cito the fact that the farmer is now the main reliance of those who deal in merchandise or manufactures in this State. If farmers are prosperous, if they obtain paying prices for their produce, they have money with which to obtain purchased comforts and necessaries from those who live by selling them. If the farmers have money the country merchant drives a thriving trade; if the country merchant eells well, the city importer makes quick and easy collections, and his profits accumulate. Reverse the picture; rob the producer of hie reward, and the whole mechaniem of trade moves with crying bearings, or not at all. Of what advantage then will it be to the merchant, if he saves a little per cent. and a little time by withdrawing hie patronage from the eailor whose eervices are indispensable to our prosperity as a grain-ehipping country?

This suhject is one which, upon its face, demands the attention of all who are interested in our leading industry. It would be well for farmers to discuss it, and to demonstrate to the merchant that his policy is euicidal. The merchant often needs a hint of this kind, for in his zeal to catch a present profit he is apt to overlook the influence of this act. We regard the matter of much importance to our readers, and may rccur to it.

IMPORTANT FIND OF IRON ORE.—Some residents of Seattle, W. T., recently discovered a mountain of brown hematite iron ore, which is pronounced by competent judgss to be equal to the best specimens of Lake Superior ore. It is variously eetimated to contain from 75% to 80% of pure iron by men experienced in such matters. Two sacks of the ore were brought to town, and during the early part of the week it will be smelted so as to ascertain the exact quality. The mountain is so located that the ore could be shoveled directly into the hold of the biggest vessel tbat floats without any transportation. The discoverere think they have got a better thing than a rich claim on Ruby, and if the ore turns out as rich as it is now suppoeed to be they undoubtedly have. The great intereet awakened in the manufacture of iron in western Washington will doubtless lead to the discovery of valuable deposite of the same mineral in other localities.—*Seattle Intelligencer.*

FAMINE is decimating the population of Asiatic Turkey.

News in Brief.

IN all Europe and America 63,631 breweries produce yearly 3,480,000,000 gallons of beer.

MANY Jesuits will leavs Italy for America as soon as the decrees against them are enforced.

NEW ORLEANS has shipped to France and Italy within a year 2,400,000 gallons of cotton seed oil.

THE quantity of cotton consumed in the world in 1878 was 54 timee greater than in 1778.

THE Southern Pacific railroad will pay taxee on more than $750,000 in San Bernardino county alone.

THE Chinese Embassy is at Mazatlan, Mexico. It is so numerous that no hotel can contain it.

THE New York Supreme Court has refused Mrs. Belva Lockwood admission to practice at its bar.

THIRTEEN train-wreckere in Spain have been sentenced to death and thirteen to twenty yeare imprisonment.

THE U. S revenue cutter *Corwin* sailed May 22d with supplies for whalers and the *Jeannette* exploring steamer.

THE Kansas extension of the St. Louis and S. F. railroad is completed to Wichita, 500 miles from St. Louis.

A RAILROAD will be constructed between Matamoras and Monterey, and between the latter place and Saltillo in Mexico.

SMITH, the defaulting Treasurer of North Andover, Mass., has been sentenced to eix years at hard labor in the State Prison.

ONE THOUSAND wagon loads of emigrauts are waiting on the borders of the Ute Reservation in Colorado for permission to enter.

MAJOR JOHN T. HARROLD has recovered $30,000 damages from the New York Elevated railroad for injuries eustained in a collision.

ANOTHER barn was hurned in the euhurbs of this city May 25th, being the third within two daye, the euppoeed work of incendiaries.

PRADO, the President of Peru, has arrived in New York. He says that his mission has failed and tbat he will not return to Peru.

ON Friday, 21st inst., the schooner *Joseph*, from this port for Navarro river, went ashore on Bodega head. The crew reachcd shore in safety.

THE question of the election of a colored Bishop was indefinitely postponded in the M. E. Confcrence at Cincinnati by a vote of 229 to 139.

FARMERS in Tulare county fear that the labor necessary to harvest their crops will be scarce, even at $3 per day, the rate which they propose offering.

TUESDAY morning, 25th inst., the elevator at Bauer, Torbriner & Co's etore, 547 Market street, fell a distance of 25 feet, seriously injuring 5 young women.

THE work of completing the branch State prison at Folsom has been commenced, and will be done, as far as possible, by convicte from San Quentin.

THE first passenger train ran over the Utah Southern to Milford, May 12th. Gov. Murray and party visited the mines of the Milford camp, and explored the horn eilver ore body.

HENRY CLAY, a grandson of tbe famous Senator, will accompany the Howgate Arctic Expedition as an aid to Lieut. Howgate. Mr. Clay, who is known in Kentucky as "Young Harry Clay," ie 29 years of age.

THE tunnel under the Hudson is being pushed at the rate of three feet a day by three shifts. It will cost $10,000,000, and the company anticipate having it completed in time for the great World's Fair in New York in 1883.

LARGE numbers of prospectors are reported to be leaving Leadville, Colorado, on their way to the Gunnison country. The roade from all directions are lined with wagons, and partiee mounted and on foot in quest of the new mining region.

AT Barcelona (Spain) on the 22d inst., 1,000 cotton epinners wrecked and set fire to a mill, but the police and military checked the fire and arreste6 the leaders of the mob. The Prefect of Police has issued a decree to dissolve every trade union in Catalonia.

PRESIDENT HAYES and his Cabinet and Governor Lorne, of Canada, will be invited to attend the celebration of the 250th anniversary of the eettlement of Boston, to take place on the 17th of September. The city has appropriated $25,000 for the celebration.

A CHINAMAN has been appointed a Deputy Sheriff in New York. This ie the firet case where a native of China has ever held any kind of an office in this country. He was appointed at his own request, for the protection of his countrymen in the Chinese quarter of New York.

AT the Cabinet meeting, May 25th, the only matter under conaideration was the request of the S. P. Railroad Co. for the use of troops to aid the Marshal in serving the process of the Courts. After discuseion the snbject was referred to the Attorney-General for his decision.

A MEETING was held at Stockton on Monday night to further a project for constructing a narrow-gauge railroad from Stockton to Bodie, there to connect with a projected narrow-gauge system for the State of Nevada. It was announced that Eastsrn capital will back the scheme.

A MAN in New Orleans has for pets a host of big and little spiders. He first became enamored of them on account of their thrift, courage, industry and skill. He has at length become so engrossed with them as pets that he epends his whole time with them, and does not care to see visitors.

OUR AGENTS.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. Tharp—San Francisco.
J. F. Osborne—San Francisco.
R. W. Crowell—California.
A. C. Knox—Pacific Coast.
G. W. McGrew.—Santa Clara county.
Capt. W. H. Seamens—Arizona.
M. P. Owan—Santa Cruz County.
H. E. Hallett—Alameda County.
Parley P. Kilbourne —Sacramento County.
M. B. Starr—Contra Costa county.
C. A. McMahon—Sutter and Yuba counties.
J. W. A. Wright—Merced, Tulare, Kern and Fresno counties.
H. G. Olivar—El Dorado, Nevada and Placer counties.
N. E. Boyd—San Bernardino Co.
S. M. Peray—Los Angeles, Cal.
Jared C. Hoag—California.
M. H. Smith—Solano, Napa, Sonoma, Lake and Mendocino counties.
Ed. G. Frisbie—Shasta county.
W. A. Holland—San Mateo county.

Quinine and Arsenic

Form the basis of many of the Agus Remedies in the market, and are the last resort of physicians and people who know no better medicine to employ for this distressing complaint. The effects of either of these drugs are destructive to the system, producing headache, intestinal disorders, vertigo, dizziness, ringing in the ears, and depression of the constitutional health. Ayer's Ague Cure is a vegetable discovery, containing neither quinine, arsenic, nor any deleterious ingredient, and is an infallible and rapid cure for every form of Fever and Ague. Its effects are permanent and certain, and no injury can result from its use. Besides being a positive cure for Fever and Ague in all its forms, it is also a superior remedy for Liver Complaints. It is an excellent tonic and preventive, as well as cure, of all complaints peculiar to malarious, marshy and miasmatic districts. By direct action on the liver and biliary apparatus, it stimulates the system to a vigorous, healthy condition.

For Sale by all Dealers.

Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Gruhor's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Extra Copies can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew Jackson's Best Sweet Navy Tobacco.

LEATHER.

[WHOLESALE.]
Wednesday, M., May 26, 1880.

Sole Leather, heavy, lb	32 @ 35
Light	28 @ 30
Jodot, 8 Kll., doz	33 00 @42 00
11 to 13 Kll	50 00 @55 00
14 to 18 Kll	65 00 @75 00
Second Choice, 11 to 16 Kll	40 00 @65 00
Simon Ulmo, Fsmales, 12 to 13 Kll	53 50 @58 00
14 to 16 Kll	63 00 @67 00
16 to 17 Kll	69 00 @71 00
Simon, 18 Kll	51 00 @64 00
20 Kll	— @65 00
24 Kll	70 00 @73 00
Robert Calf, 7 and 9 Kll	29 00 @32 00
Kips, French, lb	1 00 @ 1 37½
Cal. doz	48 00 @54 00
French Sheep, all colors	12 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @10 00
For Linings	5 50 @10 00
Cal. Russet Sheep Linings	3 00 @ 5 50
Boot Legs, French Calf, pair	— @ 4 50
Good French Calf	— @ 4 00
Best Jodot Calf	4 75 @ 5 25
Leather, Harness, lb	35 @ 40
Fair Bridle, doz	45 00 @65 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @36 00
Buff, ft	20 @ 22
Wax Slds	19 @ 20

LUMBER.

Wednesday M., May 23, 1880.

CARGO PRICES OF REDWOOD.		REDWOOD. RETAIL PRICE.	
Rough, M	14 00	Rough, M	18 00
Surface	24 00	Pickets, Rough	15 00
Rustic	24 00	Pointed	15 00
do, No. 2	18 00	Fancy	22 50
Flooring	24 00	Siding	20 50
do, No. 2	17 00	Surfaced & Long Beaded	30 00
Beadsd Flooring	28 00	Flooring	25 00
Refuse	20 00	do, No. 2	17 00
Half-Inch Siding	20 00	Rustic, No. 1	25 00
Refuse	15 00	do, No. 2	18 00
Half-Inch Surfaced	24 00	Battens, lineal ft	—
Refuse	18 00	Shingles M	2 00
Half-Inch Battens	16 00	PUGET SOUND PINE RETAIL PRICE.	
Pickets, Rough	11 00	Rough, M	18 00
Rough, Pointed	12 50	Fencing	18 00
Fancy, Pointed	18 00	Laths	3 50
Shingles	1 75		

RETAIL GROCERIES. ETC.

Wednesday M., May 26, 1880.

Buttor, California		Rice	8 @ 12
Choice, lb	25 @ 45	Yeast Pwdr, doz	1 50 @2 00
Cheese	18 @ 25	Can'd Oysters doz	2 00 @3 50
Eastern	25 @ 30	Syrup, S F Gold'n	75 @1 02
Lard, Cal	13 @ —	Dried Apples, lb	10 @ 14
Eastern	20 @ 25	Ger. Prunes	12½@ 10
Flour, ex. fam, bbl	8 00 @9 00	Figs, Cal	9 @ 15
Corn Meal, lb	2½@ 3	Peaches	11 @ 10
Sugar, wh. crshd	12½@ 13½	Oils, Kerosene	50 @ 50
Light Brown	8 @ 9½	Wines, Old Port	3 50 @5 00
Coffee, Green	23 @ 35	French Claret	1 00 @2 50
Tea, Fine Black	50 @1 00	Cal. doz hot	3 00 @4 50
Finest Japan	55 @1 00	Whisky, C K, gal	3 50 @5 00
Candles, Admt'e	15 @ 25	French Brandy	4 00 @8 00
Soap, Cal	7 @ 10		

Signal Service Meteorological Report.

San Francisco.—Week ending May 25, 1880.

May 19	May 20	May 21	May 22	May 23	May 24	May 25
HIGHEST AND LOWEST BAROMETER.						
30.158	30.084	30.003	30.065	30.087	30.128	30.059
30.074	29.957	29.937	29.982	30.028	30.032	29.980
MAXIMUM AND MINIMUM THERMOMETER.						
62	63	67	64	65	69	74
52	52	51	51	50	51	57
MEAN DAILY HUMIDITY.						
84.7	81.7	72	71.3	68.7	57.3	30.7
PREVAILING WIND.						
W	W	W	W	W	W	N
WIND—MILES TRAVELED.						
282	341	257	265	257	204	319
STATE OF WEATHER.						
Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear.
RAINFALL IN TWENTY-FOUR HOURS.						

Total rain during the season, from July 1, 1879, 26.66 in.

GENERAL MERCHANDISE.

[WHOLESALE.]
Wednesday M., May 26, 1880.

CANDLES.	
Crystal Wax	17 @17½
Eagle	12 @—
Faeuil Spertm	25 @30
CANNED GOODS.	
Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co.'s. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	8 50 @ —
Preserved Mutton, 2 lb. doz	3 50 @3 62½
Beef Tongue	6 25 @ —
Preserved Ham, 2 lb. doz	8 00 @ —
Devilled Ham, 1 lb. doz	4 50 @ —
do Ham, ½lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	3 75 @ —
2 lbs	2 75 @ —
Spiced Fillets, 2 lbs	3 75 @ —
Head Cheese, 3 lbs	3 75 @ —
COAL—Jobbing.	
Australian, ton	— @ —
Coos Bay	— @ 5 50
Bellingham Bay	— @—
Seattle	5 50 @ 5 00
Cumberland	12 00 @13 00
Mt Diablo	4 75 @ 5 75
Lehigh	11 50 @12 00
Liverpool	5 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @—
Vancouver Id	7 50 @—
Wellington	7 00 @ 8 00
Charcoal, sack	75 @—
Coke, bush	60 @—
COFFEE.	
Sandwich Id, lb	— @—
Costa Rica	15 @
Guatemala	15 @ 15
Java	24 @— 25
Manila	15 @—
Ground, in cs	25 @—
FISH.	
Saoto Dry Cod	— 3 @— 3½
do in cases	— 4 @— 4½
Eastern Cod	— @—
Salmon, bbls	7 00 @ 7 50
Hf bbls	3 50 @ 4 00
1 lb cans	— @ 1 30
Pkld Cod, bbls	— @—
Hf bbls	— @—
Mackerel, No. 1, Hf Bbls	9 50 @10 00
In Kits	1 55 @ 1 75
Ex Mess	— @ 3 25
Pkld Herring, hx 3	00 @ 3 50
Boston Smkd Hlg	50 @—
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Assted sizes, ksg	— @ 5 00

OILS.	
Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 07 @ —
do, No. 2	95 @ —
Baker's A A	— @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl	90 @ —
Boiled	93 @ —
Cocoanut	60 @ —
China nut, cs	70 @ —
Sperm	1 40 @ —
Coast Whales	35 @ 45
Polar	— @ 45
Lard	80 @ 90
Oleophine	— @ —
Devoe's Bril't	16 @ 17½
Photolithe	— @ —
Nonpariel	— @ —
Eureka	19 @ 20
Barrel keroseno	20 @ —
Downer Ker	30 @ —
Elaine	34½@ —
PAINTS.	
Purs White Lead	6½@ 10
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 50
RICE.	
China, Mixed, lb	5 @ —
Hawaiian	7 @ 7½
SALT.	
Cal. Bay, ton	14 00 @22 00
Common	6 50 @14 00
Carmon Id	14 00 @22 00
Liverpool fins	18 00 @— —
SOAP.	
Castils, lb	8 @ 15
Common brands	4½@ 8
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	47½@ 50
Cassia	19 @ —
Nutmegs	97½@1 10
Pepper Grain	14 @ 15
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cube, lb	— @ 11
Powdered	— @ 11½
Fine crushed	— @ 11
Granulated	— @ 10½
Golden C	— @ 9
Cal. Syrup, kgs	70 @ —
Hawaiian Molasses	25 @ 30
TEA.	
Young Hyson, Moyune, etc	40 @ 55
Country pckd Gunpowder & Imperial	35 @ 75
Hyson	30 @ 35½
Fooo-Chow C	27½@ 32
Japan, 1st quality	40 @ 42
2d quality	25 @ 40

METALS.

[WHOLESALE.]
Wednesday M., May 26, 1880.

IRON.— American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	— — @35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 8½
Horse Shoes, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.— English Cast, lb	15 @ 18
Black Diamond, ordinary sizes	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 15
Plow Steel	9 @ 10
COPPER.— Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	— @—
Bolts	38 @— 42
Old	— @— 18
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.— Pig	6 @— 5½
Bar	— @— 5½
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck, " "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.— 10x14 I C Charcoal	— @10 50
10x14 I C Coke	10 00 @10 00
Banca Tin	— @25 00
Australian	— @20 00
I. C. Charcoal, Roofing 14x20 " " " 20x28	— @10 00 21 50 @22 00
ZINC.— By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	10½@— 11
NAILS.— Assorted sizes	6 50@5 75

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]
San Francisco, May 25, 3 P. M.

Silver, ½.
Gold Bars, 890@910. Silver Bars, 10@18 @ cent. discount.
Exchange on New York, 25, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs 3⁄8 dollar; Mexican dollars, 93@94.
London Consols, 99 5-15; Bonds (4½), 109.
Quicksilver in S. F., by the flask, 40 to 42½@45c.

Amusements.

BALDWIN'S THEATER.

Thomas Maguire ..... Manager.
Chas. H. Goodwin ..... Treasurer.
J. P. Chapman ..... Assistant Treasurer.

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Open every evening and Saturday Matinee.

Mining and Other Companies.

Persons interested in incorporated ehares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, Room No. 37, San Francisco, May 15, 1880. At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 55) of Fifty Cents (50c) per share was declared, payable on THURSDAY, May 20, 1880. Transfer books closed until 21st instant.

W. W. TRAYLOR, Secretary.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 29th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, May 21st, 1880, and day of sale to Wednesday, June 23d, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, June 24, 1880, and day of sale to Monday, July the 19th, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Fifth day of May, 1880, an assessment (No. 42) of 20 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company. No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of June, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the Fourteenth day of July, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale

W. C. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Palmer Ice and Refrigerating Company.—

Location of principal place of business, San Francisco, California. Location of Works, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 2), levied upon the Twenty-First day of April, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Certificate.	No Shares	Amt.
C C Palmer	7	200	$1,000 00
Wm E Wood	8	50	250 00
August Hemme	5	100	500 00

And in accordance with law, and an order of the Board of Directors, made on ths Twenty-First day of April, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 303 Montgomery street, San Francisco, California, on Thursday, the Seventeenth day of June, 1880, at the hour of one o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

C. C. PALMER, Secretary.

Office—No. 303 Montgomery street, San Francisco, California.

W. E. HALE,

Arizona and California Mining Agency.

Parties having mining property for sale, or those wishing to purchase are invited to call. Reliable agents in the Mining Districts of Arizona and in the Eastern cities.

☞ Best of City and Eastern references. ☜

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BELTING AND PACKING.

EXTRA QUALITY ENDLESS BELTS,
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CAR SPRINGS, VALVES, GASKETS, Etc.

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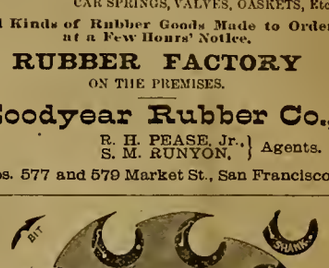
ON THE PREMISES.

Goodyear Rubber Co.,

R. H. PEASE, Jr., S. M. RUNYON, } Agents.

Nos. 577 and 579 Market St., San Francisco.

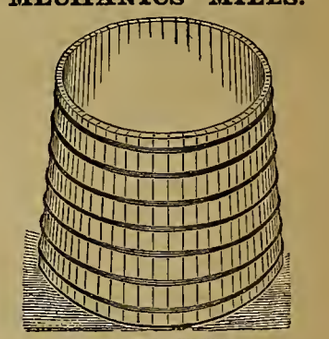


Entirely different from other Saws. When dull, sharp teeth, which only cost a trifle, can be inserted in a few minutes, without taking the saw off of the mandrel, and no skill is required in doing it. Send for Catalogue showing their vast superiority. More of them are being sold than of any other kind, and we are altering all other kinds to the Chisel Tooth.

TATUM & BOWEN,

329 Market Street, 3 Fremont Street

MECHANICS' MILLS.



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WELLS, RUSSELL & CO.,
Mechanics' Mills, corner Mission and Fremont strsct.

Certificate of Co-partnership

OF

GEO. SPAULDING & CO.

We, the undersigned, do hereby certify that we compose a partnership transacting Printing Business in the City and County of San Francisco, State of California, under the name and style of George Spaulding & Co. That the names in full of all the members of such co-partnership and their respective places of residence are as follows, viz.: George Spaulding, San Francisco; J. Munroe Miller, San Francisco; Dwight Germain, San Francisco.

In witness whereof we have hereunto set our hands and seals, this first day of May, A. D. 1880.

GEORGE SPAULDING,
J. MUNROE MILLER,
DWIGHT GERMAIN.

State of California, } ss.
City and Co. of San Francisco, }

On this twenty-seventh day of May, A. D. 1880, before me, Sam'l S. Murfey, a Notary Public, in and for the said City and County, residing therein, duly commissioned and sworn, personally appeared George Spaulding, J. Munroe Miller and Dwight Germain, known to me to be the persons described in and who executed and whose names are subscribed to the within and annexed instrument, and they each acknowledged to me that they executed the same.

In witness whereof, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written. SAML S. MURFEY, Notary Public.

"Endorsed"—Filed, May 27, 1880.
WILLIAM A. STUART, Clerk.
By J. Whalen, Deputy Clerk.

REMOVAL.

The offices of the following Companies will remove to Room No. 79, Nevada Block, No. 309 Montgomery street, Monday, May 24, 1880:

Chollar Mining Co.,
Potosi Mining Co.,
Consolidated Imperial Mining Co.,
Challenge Consolidated Mining Co.
Silver Hill Mining Co.,
St. Louis Mining Co.,

W. E. DEAN, Secretary.

Iron and Machine Works.

HOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St. (rear of Ætna Foundry),

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PRACTICAL BOILER MAKER.

Marine, Stationary and Portable Boilers, Smoke Stacks Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK,

Repairing promptly attended to at the lowest possible terms.

UNION IRON WORKS,

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ROOT, NEILSON & CO.,

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STEAM ENGINES, BOILERS AND ALL Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

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PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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Golden State & Miners Iron Works,

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Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE.

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THOMPSON BROTHERS,

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VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
HORIZONTAL ENGINES,	VENTILATING FANS,	PANS,
AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
SHAFTING,	PULLEYS,	ETC., ETC.

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Steam Engines and all Kinds of Mill and Mining Machinery.

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Propeller Engines either High Pressure or Compound Stern or Side Wheel Engines.

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Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

Mill Machinery.

Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

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Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanks.

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Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for use on land. Water Pipe, Pump Air Column, Fish Tanks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

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ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING, AND MINING MACHINERY INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERT. ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, ETC., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

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STEAM LAUNCHES, Barges and Steam Tugs constructed with reference to the Trade in which they are to be employed. Speed, tonnage and draft of water guaranteed.

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SUGAR MILLS AND SUGAR-MAKING MACHINERY made after the most approved plans. Also, all Boiler Iron Work connected therewith.

WATER PIPE, of Boiler or Sheet Iron, of any size made in suitable lengths for connecting together, sheets rolled, punched, and packed for shipment ready to be riveted on the ground.

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SHIP WORK. Ship and Steam Capstains, Steam Winches, Air and Circulating Pumps, made after the most approved plans.

PUMPS. Direct Acting Pumps, for Irrigation or City Water Works purposes, built with the celebrated Davy Valve Motion, superior to any other Pump.

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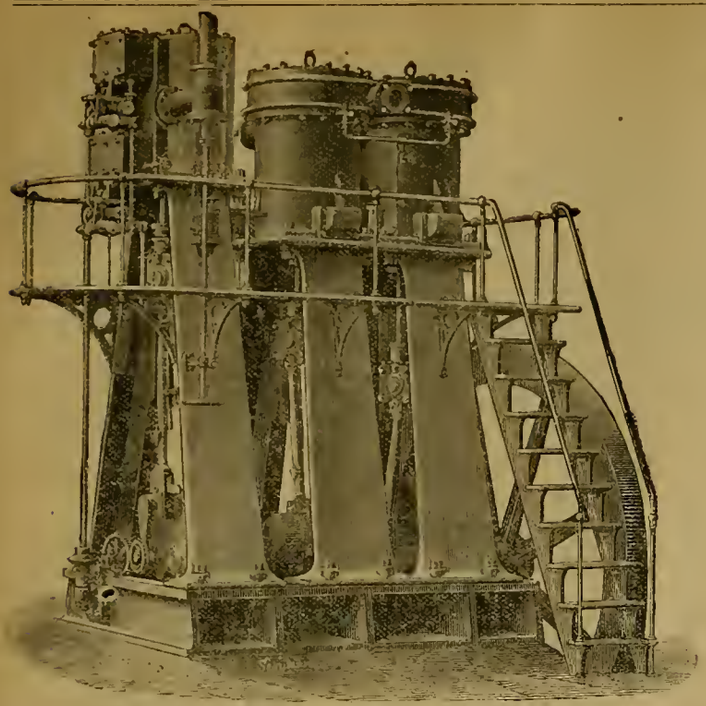

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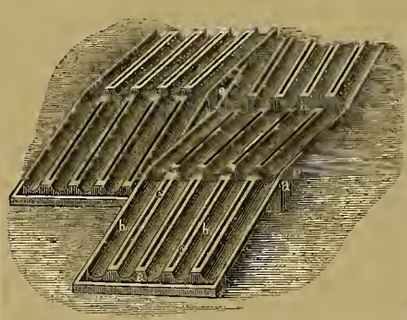

This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

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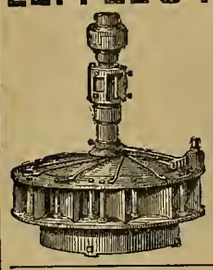

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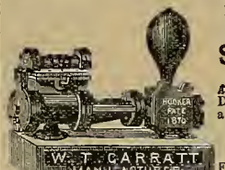

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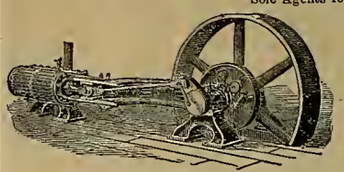

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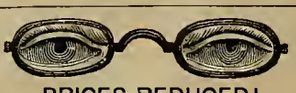

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SAN FRANCISCO, SATURDAY, JUNE 5, 1880.

VOLUME XL Number 23.

A Gold Quartz Boom.

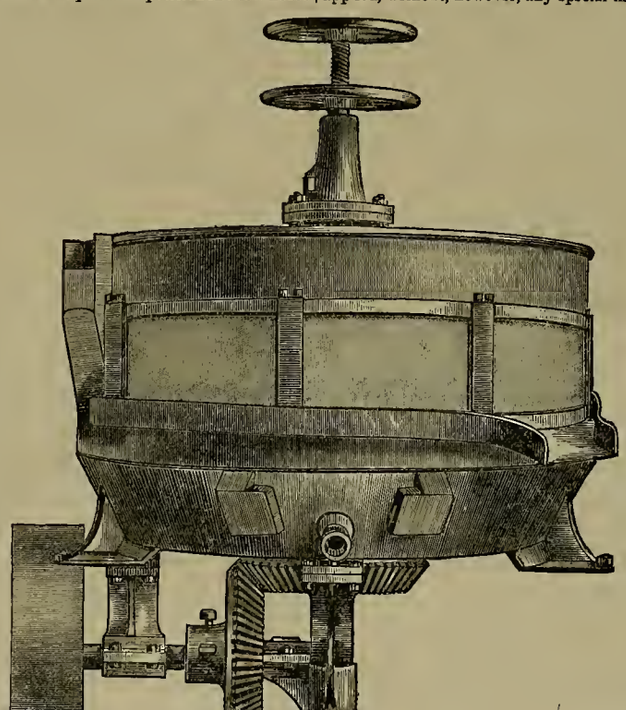
We gather from our large list of mountain exchanges, that there is a veritable "boom" in the gold-quartz regions, and that prospectors have rarely been more numerous or busy. In Calaveras county, for example, the *Chronicle* says the hills swarm with quartz hunters, and that capitalists are waiting eagerly for an opportunity to take advantage of good developments. The boom pervades the county, and many idle and abandoned mines, in the ownership of poor men, are now the scenes of unwonted activity. The *Chronicle* specifies several well-developed mines in the county, which have been sold to S. F. capitalists, the most noteworthy of which is the Lone Star at West Point. It is to be expected that some of the many discoveries which have been or may be made will prove tangible and valuable properties. Apart from this consideration, the boom has already produced much good by the revival of one of the great industries of California. For several years gold quartz mining in our mountain camps had languished or been carried on in a half-hearted way, and mines that were well worth the cost of developing, were permitted to lie idle. In most instances the owners were too poor to work them after reaching a point where machinery became necessary; and capital distrusted a mine that was permitted to lie idle while its owners boasted of its value.

Now that the interest of our enterprising men of capital has been directed to the gold mines of the State as a profitable means of investment, it is to be hoped that the owners of the mines will meet them in a business-like and reasonable way, and offer them fairly prospected veins, or, better still, fairly developed veins, at a price which a business man can afford to pay. Hitherto the business of selling and buying mines has been intensively speculative. It is time that it was placed where it belongs; that is, in the list of ordinary business transactions. Of course, the miner is always entitled to fair pay for prospecting and developing his mine and to a reward commensurate with its known value; after that has been done, all the risk of working the mine and the accruing profits, whether they are large or small, belong to the buyer. And of course, in buying a mine, the purchaser should be allowed—indeed, he should insist upon it—a broad and reasonable margin to cover his probable or possible loss; that is, his risk of loss ought to be reduced to a minimum. There is neither sense nor equity in the owner of an ordinary gold or silver mine, either of which is subject to countless mutations, asking a price for it which amounts to a fortune—which will give him his "pile," as it were, by a lucky turn of the wheel. This is not business, but speculation, pure and simple. It has done much to discredit and discourage investments in mines in California. Indeed, it is of a piece with the policy which kills the goose that lays the golden egg. Place the whole scheme of mining, including the laborious work of prospecting for veins, of opening and developing them, of selling and buying, or of bringing them to fruit—on a common business basis, in which the right, pay, and reward of the miner shall be recognized no less than the right of the capitalist to reasonable protection and ground of profit for his capital, and in our judgment quartz mining will receive a new impetus, and will become one of the most productive interests of the State. It will offer something more than the daily wages to a large class of miners; while to the capitalist it will offer an investment which, with its probable risks, combines also great profits.

Reese River District, Nevada.—Austin, the capital of Lander Co., and the center of the Reese River mining district, is reported to show signs of its old activity and prosperity. The chief company in the district, the well-known Manhattan, has already produced some $20,000,000 from a small part of famous Lander hill. It is now sinking a great working shaft, known as the Lander shaft, which at last accounts was 350 ft. deep. The Nevada Central railroad ought to increase the importance of Austin, for within a radius of 25 miles are situated the districts of Yankee Blade, New York Canyon, Amador, Ravenswood, Big Creek, Washington, Bunker Hill, Kingston and Birch Creek.

A Continuous Discharge, Crushing and Grinding Pan.

We illustrate herewith a new form of pan devised and manufactured by Steiger & Kerr, of the Occidental foundry, 137 First St., in this city. This pan is designed to receive ore direct from a rock breaker, and reduce it to the fineness necessary for amalgamation, thus taking the place of other crushing appliances. The cost of this mill is comparatively little, and the cost of erection, which adds so much to the expense of the stamp mill after it leaves the foundry, is in this case reduced to a fraction, as the mill is complete in itself, and requires no expensive foundations, bed logs, battery, frames, etc., but can be placed in position in a few hours after it arrives on the ground, without the aid of skilled labor.



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The manufacturers give the capacity of each pan as capable of reducing 10 tons of average ore in 24 hours, the ore being first broken in a rock-breaker small enough to go through a half-inch sieve. The grinding and scouring action in the gold before it is discharged is an important feature in this mill, especially when "rusty" gold is encountered. The plan of feeding is the same as in a stamp mill, either an ore feeder or hand feeding being adopted, as may be desired. Parties interested in mining machinery can see this new pan in operation at the address given above.

International Postage Stamp.—France and Belgium are reported to have just effected arrangements for the introduction of an international postage stamp. Such a measure will greatly facilitate intercourse between the two countries, and marks a decided stride in civilization. It will allow the payment of small sums of money between the countries in stamps, and will permit persons inquiring for information to inclose stamps for a reply. We hope that the good plan will soon be universally adopted.

Copper Leaching.—No. 3.

[Written for the Mining and Scientific Press by C. H. Aaron.]

The methods briefly outlined in Nos. 1 and 2 are adapted only to sulphureted ores of low grade, containing, say, from 1% to 5% of copper, and of which the gangue is not calcareous. Calcareous ores of this low grade will probably be best left alone at present, unless circumstances favor concentration of the valuable portion by fire, air, or water.

Among the most recent and best leaching processes adapted to copper ores of every kind containing from 5% to 15% of the metal, is that known as the Hunt & Douglass, which, when applied, without, however, any special modification, to ores which contain also silver, has been called the

Hunt, Douglass and Stewart Process.

That this process has not been a success, in a few instances, should not be allowed to weigh against it in the estimation of the mining public, since the failures have been due to causes quite outside of the merits of the process, which has been successfully applied in various places, notably in Servia, where a 2½% ore was profitably worked by Rickard.

The Hunt & Douglass process, first made known to us in 1866 as the invention of the celebrated chemist and geologist, Prof. Sterry Hunt, is based on the decomposition of oxides or carbonate of copper by a hot solution of protochloride of iron, forming chloride and dichloride of copper, the first containing 47.17% of copper, and soluble in water or brine, hot or cold; the second containing 64.1% of copper, and soluble practically in hot brine only, for which reason salt is added to the bath of protochloride of iron.

Unlike the preceding methods, this process requires the ore to be reduced to powder, the fineness of which varies with different ores and must be found by trial; for while, as in all cases where ore is to be leached, or lixiviated, a certain degree of comminution is necessary to the success of chemical treatment, yet the mechanical part, that is the filtration or decantation, proceeds better when the material is rather coarse. For this reason that crusher or pulverizer which delivers the ore with the least variation in the size of the particles, is the best, and if its action is also such as to split the stuff into thin, angular and flattened fragments, rather than to grind it into rounded grains, it leaves nothing to be desired. A combination of rollers and sieves is perhaps best for this purpose, and next to it, the pulverizing barrels with constant discharge.

Sulphureted ores must be roasted after crushing, and the natural oxides and carbonates are much improved, chemically and mechanically, by calcination. Calcareous ore must contain enough sulphur to turn the lime into a sulphate. A dead roast is not necessary, as the presence of soluble sulphates is beneficial rather than otherwise. An addition of salt in the roasting is good, especially if the ore carries silver. For furnaces we have the old reverberatory, the Stetefeldt, the White, the Bruckner, the O'Hara, the Ricard and others, all adapted, according to circumstances, to the work.

The roasted ore constitutes a sand containing copper in the forms of oxide and sulphate, or, if salt has been used, chloride; perhaps also silver in metallic state, or as chlorids. Gold, if present, will remain metallic, and will not be extracted by this process. This sand is put into large tubs, provided with revolving stirrers, together with a hot solution of proto-chloride of iron and salt, made, in the first instance, by dissolving common copperas in brine. The action of the stirrers prevents the settling of the sand in a mass at the bottom, and the copper is completely dissolved in from 6 to 18 hours. Silver, if in the form of chloride, is at once dissolved in the hot brine. If metallic, it is first converted into chloride and then dissolved.

There is now a mass of sand and mud, suspended in a solution of copper, and perhaps silver, in the form of chlorides. The separation of the liquor from the earthy matters sometimes presents considerable difficulty, owing to the presence of clay and of hydrated peroxide of iron, which is produced during the solution of the copper. This separation is effected by different means, according to circumstances. If the ore is sufficiently coarse, and free from slimes to filter well, the contents of the dissolving tubs are transferred to filter tubs and the liquor is allowed to drain out. If, however, filtration is not practicable, the stirrers in the dissolving tubs are stopped and raised, the earthy matters are allowed to settle and the clear solution is drawn off. In either case the ore is washed repeatedly—first with bath solution and then with water—till all the silver and copper is removed. Other arrangements are used in the cases of very poor ores, or such as can neither be filtered nor settled in a reasonable time.

The solution of copper and silver, freed from earthy matter, is caused to flow slowly through a series of vats or tubs, some of which contain metallic copper, which throws down the silver; the rest contain scrap iron by which the copper in the solution is precipitated. When the liquor leaves these vats it is again ready for use, being restored to its original condition—a solution of proto-chloride of iron and salt—with but little loss.

An important adjunct of the process is passing the sulphurous fumes from the roasting ore, or from burning sulphur, over the liquor in the dissolving tubs and other vessels, all of which are kept covered as much as possible to retain heat and keep out the air. The consumption of iron is less in this than in any other leaching process, owing to the fact that a large proportion of the copper is dissolved as dichloride, which yields twice as much copper for a given quantity of iron as does the sulphate.

Of course there are many details and modifications of this process to enter into which would be to write a book, which is not my present purpose; but I hope enough has been said to enable the reader to form an intelligent conception of a method of copper leaching, which appears to me well worth consideration by miners and capitalists as being adapted to use in this country.

The White Pine (Nev.) *News* says the Hamilton ladies shovel off enough snow to prepare a croquet ground, and then play that fascinating game clad in ulsters, overshoes, and fur gloves.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

The "Pocket Mines" of Tuolumne County.

Rich Strikee—Eastern Investments—Live Companies, etc.

EDITORS PRESS:—Having in a previous lettsr told you something about the minss and mining industriss of Tuolnmne county in a general way, let ms now say a word or two concerning that particulsr class of deposits known as "pocket mines," of which there are a grsat many in this nsighhorhood. Thsse deposits occur only in quartz lodes, and are of a kind in which the gold is found collected in hunches instead of being disssminatsd throughout the ore-bearing mattsr generally. Pocket veins are not apt to be large, though some are met with of pretty good dimensions. Searching for these bunches or "pockets" of rich ore is a hazardous but exciting sort of business, since the miner may work a long time without realizing a dollar, while, on the other hand, there is a chance of his striking any day sometbing of great value. While tbese pocket veins are found in nearly all parts of the Cabfornia gold regions, they seem to be more numerous in tbis connty than elsewhere in the State, several of great richness having been discovered and worked in the immediate vicinity of this city.

The History of this Class of Mining

Takes us back to pioneer times, the first noted find of this kind baving occurred in Bald mountain, two miles north of Sonora, as early as 1852, baving been made by eome Mexicans wbo took from the pocket found there a great deal of gold, bow much, was never exactly ascertained. About the same time, and even before that, many large chispas were picked up in and along what ie known as the "Nugget helt," passing througb the southerly and central parts of this city, and which hae ever since been more or less worked. This belt derived its gold from a range of quartz veins running a little above, and wbich also gave to the Sonora basin its wonderful enricbment. Ever since the latter first began to be worked it has yielded a great many big nuggets, the number, of course, diminisbing with time, though this quartz range ie now being worked and affording, at some points along it, a great deal of gold. From

The Clark & Duvoll Claim,

Situate in the nortbwestern part of the town, and within the city limits, there have been taken out nearly $300,000 within the past eight montbs, only two of the three laboring men who own it, working in the mine, which for some time past has been closed up, for reasons known only to the owners. Encouraged by this strike, other parties have commenced sinking sbafts at different points along this lode all with eome, and about equal, chances of success.

Big Strikee and Cost of Production.

To go back a little, it may not be uninteresting to note eome of the more remarkable finds that have one time and another occurred, and the little cost that sometimes attends production in this line of gold mining. From what is known as the Morgan ground, on Carson hill, there were extracted many yeare ago gold to the value of $3,000,000, at a cost of not more than $5,000; from the Pedro claim, at about the same cost, there has been taken over $1,000,000; from the Ford claim $100,000—cost $4,000; from the Price $90,000—cost $7,000—the expense, aside from labor, attending the extraction of the large sum mentioned from the Clark & Duvoll location having been little more than the suhsistance of two men, price of tools, etc. Ae there was from this same claim taken out by two miners—Sedgwick and Van Pragg—$71,000, a long time ago, the probabilities are that it is not yet exhausted of its riches, these men having abandoned the ground in the belief that they had gotten out all the gold it contained. The claim cost the present owners only $50, eo little value was attached to it by the parties from whom they purchased not very long ago.

As would naturally be expected, the euccess tbat has attended this branch of mining has tended to encourage prospecting, and imparted new life to quartz operations generally, which, as already remarked, were never so active and promising in this county as at present.

Quartz Mille in the County.

There are now more than 20 quartz mills running in this county, with half ae many more making preparations, and nearly ready to start up.

Tbe following list includee most, but not quite, all the mines here on which qnartz mills have been built or are ahout to be erected, viz.: Confidence, 40 etamps; App, 25; Heslip, 15; Silver, 10; Quartz Mountain, 20; Rawhide Ranch, 20; Harris, 10; Hunt, 40; Golden Gate, 10; Big Creek, 10; Mount Jefferson, 10; Nonpariel, 10; Riverside, 20; Big Basin, 10; Hunter, 10; Ferguson, 20; Spring Gulch, 10; New Albany, 10; Golden Rule, 20; Soulshy, 20; Telegraph, 20; Daegner, 10; Louisiana, 8; Grizzly, 20; Consuello, 20; Star King, 5; Eureka, 10; Buchanan, 8; Raymond, 10, Patterson, 10; Excelsior, 10; Keltz, 20; Kelsey, 10; Atlas, 20; Evans, 5; Hazle Dell, 5; Little Gem, 10; Chandler & Beal, 4; Bear Creek, 5; Knox & Boyle, 10; Santa Maria, 10; Von Tromp, 5.

Altogether tbere have been put up as many as 600 stamps in this county, of the mills above enumerated, scarccly one-half are now in good condition, say about 250 stamps fit for active service. Many of these establishments never were well built nor efficiently eqnipped, while a large psrcentage of them have, for various reasons, hsen neglscted and fallen into a state of partial or utter decay. Of a large nnmber of these establishmsnts built bere in times past and afterwards entirely destroyed by firs, flood or other casualty, no msntion is above made. The arastra is much in use here, heing mostly employed for prospecting purposcs or run where the mines yield only small quantities of exceptionally rich ore. The building of quartz mills in this part of the country has heretofore cost at the rats of about $1,000 per stamp, except in cases of large and especially well-outfitted establishments where the cost has been more, sometimes nearly twice as much. As expsnses of all kinds connected with mining are now much less than formerly, a well-equipped quartz mill can at present he built here at an average cost of $600 or $700 per stamp, and where water is used for propulsive power, at eomething less.

When epeaking in my last letter to the PRESS concerning the operations and plans of

The Boston and Pacific Mining and Investment Company,

Organizsd for the purpose of prosecuting quartz mining in this county, it should have been stated that this company intend to carry on the business in a thoroughly eystematic manner and on an extended ecale, to which end they have not been content with the purchase of a single mine, but have at the outset secnred several properties of large and well-ascertained value. Not only so, these provident people have taken etcps to obtain additional mines, hoth by location and purchase; aleo forest and farming lande, it being their determination to provide against any possihle ore dearth after having once supplied their mines with reduction works, and, in short, to possess within themselves all the means and requirements eessential to making their enterprise a permanent success. They will have eeveral of their mines situated in juxtaposition or not far from each other, simultaneously devcloped, with a view to having reserves established at all times in one or more of them, thereby guarding against the occurrence of any entire failure of ore. This is a wise policy, and one that could be adopted to advantage in vein mining generally. With valuable water franchises, furnishing power enough to drive 100 etamps, with wood lands and farming lands, with groups of mines well opened and mills well equipped, and, finally, a first-clase management in the field, thie company is warranted in counting on a good outcome for their venture here. With their painstaking attention to business, their close figuring and habits of thrift, it may even happen that these New Englanders will beable to teach us old Cabfornians something about mining that would be well for us to know, and knowing, to practice. Wby should not our home companies, instead of relying upon a eingle lode or claim for tbeir ore supplies, possess themselves of several? And why should they not, where it is practicable, employ water instead of steam for orhoisting and crushing? And, furthermore, why not always take up or otherwise procure a tract of land to go with their mines? Water, timber and farming land will before long constitute valuable adjunots to these mining propertiee, and this company has evinced their sagacity in aggregating, through their agents, so many minee and so much land which, with their other appendages, make up one of the most complete and valuable estates to be foud in

OLD TUOLUMNE.

Sonora, May 29, 1880.

Long Perseverance Rewarded.

The Durango Mining Co., of N. Y. city, have heen for many years driving a tunnel to drain the Candelaria mine at San Dimas, in the State of Durango. For nearly a half century its valuable workings have been filled with water to the depth of 400 ft. In the various operations connected with this work, nearly a half million dollars have been expended, not counting interest. The water gradually siped away as the tunnel approached the old works, so that four monthe ago they were entered from above through the level of San Juan de Dios, and enficiently explored to justify fully tbe old traditions about their value. A few daye ago the resident agent of the company in this city, whose son, Augustus, is snperintendent at San Dimas, received from a younger son employed there a dispatch via Mazatlan saying: "Broke into tbe old works this morning, May 5th." The eteamer *China*, which arrived on Monday, May 24th, hrought the following graphic account of the excitement and rejoicing at San Dimas upon the consummation of this labor of years:

SAN DIMAS, May 10th.

Dear Father:—Yours of —— came to hand the other day. While you were writing, I was covering myself with gore and glory, and overloading my poor little mule with venieon. It being a great feast day of holy week, I was free to do as I pleased. We were all alone—that is to say "Muchacho," tbe dog, who is a terror alike to both deer and Mexicans, as he has a *penchant* similar to tbat of Artemus Ward's tiger, "Chiripa," the mnle, and myself. We came bome at night played ont; I with a terrible headache, "Muchacho" suffering from ovsreating and "Chiripa" from the revsrss. If you were a sportsman, I might tell you of our adventnres—how that old buck ran with a ball through his heart, till he dropped in his tracks stone dead; how the—but no, you are not a sportsman (mors's the pity), so I will spare you, and turn to a subject of more interest, *i. e.*, Candelaria.

I snppose ths mssgas you bave besn expecting so long, and that I sent on the 5th, has hy this time sped ovsr the wires to S. F., and thsnce to N. Y., advising all interested in ths property that the Candelaria tunnel is completed at last.

Of course you are anxious for details, but there are scarcsly any to give. We've done ths thing just as Gus said we would, and the miners tell me nothing could he better than the way tbe two headings have come together. The shot that did the business was fired from the old works. The moment the air whistled through the hole, all the bad air, that had been lying dormant in the nooks and corners, commenced circulating, and the last man up the shaft barely escaped with his life. The firing of rockets told me the work was finiehed some two bours before the messenger started for the coast with the dispatch. Whew! how we did clmb up the hill to the mine! "Penco" ran or trotted the whole distance, laying back his ehort eare and ehaking the bits epitefully each time I attempted to rein him in. Rockets hissed and cracked, the giant powder boomed and reverberated from the oppoeite cliffs, while all San Dimae was in the street looking at Candelaria hill.

We reached the mine and stayed only long enough to be assured there was no mistake, and immediately went down to find a *proprio* [special messenger]. I then sent to have the church bells rung, and the firing at the mine recommenced with the first stroke of the bell. With these cheery sounds in my ears, I wrote the dispatch, hargained with a swift Indian runner, and then went to dinner.

In the afternoon the miners came down in a body, bringing the crose from San Juan de Dios at their head. They halted outside the town and sent for the musicians, and then with music ahead, belle ringing, rockets firing and giant powder booming, they marched to the church, and tbere left the cross to be blessed before heing set up again in the tunnel. In the evening there was a grand ball in the plaza, with unlimited dancing and drinking, and that's the way we celebrated the completion of the great tunnel.

All that we have to do now is to lay the iron track, and begin taking out metal as fast as we want to. It is there, any amount of it.

A BRIEF HISTORY OF EUREKA.—Eureka has divided thrice as mnch money among etockholdere in its mines as it has gathered from them in assessments. It has done even better than thie. It has paid in dividends more than twice as much as bas been expended bere in the purchase of mines and in assessments together. The dividends have amounted to over $6,000,000, the assessments to a little lese tban $2,000,000. There has not eo far been expended more than $500,000 in the purchase of mines. Wo do not helieve that this record can be heaten by any mining district in America. With all its great out-put and the dividende paid thereon, Leadville cannot make euch a ehowing. It will take several years like the last for the gross yield to equal the amount paid for the pnrchase of mining property alone in that locality. If accounts are true there has been paid out in the neighborhood of $40,000,000 for mining property alone in Leadville since ite discovery. Allowing that $4,000,000 in dividends were paid last year it will take ten such profitable years to pay hack this money. Eureka's record stated briefly is this: Lese than $500,000 paid out for the purchase of the mines, and less than $2,000,000 paid out in assessments, hae reeulted in a grose out-put of over $60,000,000, and in dividends to the amount of over $6,000,000. Had there been one-tenth of the money expended in Eureka District in the purchase and development of ite mines, during the eight or nine years of its existance that there has hesn in Leadville in tbe past 18 months, our bnlbon out-put and dividends would have heen doubled. Instead of 8 or 10 eteam hoisting works (moet of those of limited capacity) we ought to-day to have 50 every one of them of sufficient capacity to prosecute the work of development to the depth of 3,000 feet. Inveetors have thought Bodie worthy the investment of $2,500,000 in assessments on a net yield in dividends of only $2,000,000. By the same rule Eureka is worthy of having at least $4,000,000 expended, more than it has yet received in developing its mines. One-half of this sum, if used with due economy and under wise direction, would result in douhling our bullion out-put and trebling the dividends of the dietrict.—*Leader.*

A NUMBER of years ago an escaped criminsl from Siberia discovered in the neighborhood of Schenkursh, in the provincc of Archangel, eand beds containing a large quantity of gold. He kept his discovery a secret, and only made it known last year on his death bed. A company for working the bede is already formed, and is at present endeavoring to obtain the concession.

Mono County Districts.

At Banton ths Diana company have hought or lsased ths Kerrick mine from tbe Vulcan company, and are now erecting hoisting works preparatory to working the Diana mins through the Kerrick. This addition of the Kerrick secures to the Diana company a property of "honanza" richness. The mill is heing put in excellent condition, so that as soon as the mins is rsady to resume work there will hs nothing to prsvent a long and prosperous run.

Clover District.

Clovsr district bas heen complstely shut out this winter, on account of the snow, which now happily is melting fast, so that in a short tims I anticipats good news from the many excellent prospects of which the district has scores. The Wild Rose mine, in spite of snow, has bsen worked all winter, and tbe tunnel is fast approaching the ledge.

Oneota District.

Ths Indian Queen mill will in all prohahility start in a few daye. They have been putting on men at the mine. Wm. Adams, who has been eo successful in the management of this property, will resume charge.

Indian District.

In the Indian district mines there ie at present but little being done. In my last letter I mentioned the negotiations for the Neal mine. The transfer has heen made, bnt how long it will he before work is commenced I cannot say. The Josephine mine, southeast of the Neal, is being prospected and some excellent rock taken therefrom.

Prospective.

Ae eoon as the snow melts off entirely we look for a rush of prospectors, as it is now well known that there are good claime in Indian and Clover districts, to be bad for the recording of them. With Candelaria booming to the east and Mammoth to the west, what can keep tbese rich minee from being found by men of means.—*Corr. Mammoth City Herald.*

A NEW DISTRICT.—A miners' meeting was held on Tuesday in Rough Creek Canyon, about five miles from Bodie, for the purpose of organizing a new district. It was decided that a mining district be organized to he known as the Drake mining district of Mono county, Cal., and that tbe boundaries thereof he as follows: The western boundary line of Bodie mining district to be the eastern boundary line of the said Drake district (heing ten miles in length); the northern and southern boundary lines to be ten miles in length, running at right angles with the eastern boundary line aforesaid, and the western boundary line to be ten miles in length and run parallel witb the said eastern boundary line. A recorder was elected to serve for the term of one year, and until the election of his successor, and he was authorized to appoint a depnty. The fees of the recorder were fixed at the following rates: For recording a notice of location of a mining claim, mill site, placer claim, or other papers, $3; for issuing certificatee of lahor, $3; for copying and attesting, or certifying, any record or paper in his office, $2. Many claims have been located and considerable prospecting is being done. There is much float quartz in the vicinity, and some prominent croppinge, bnt mostly barren. We hope, however, that "borasca on the surface meane bonanza helow."—*Esmeralda Herald.*

A LARGE BODY OF QUARTZ.—In the Alta mine on the 1950 level they bave drilled east a distance of 302 ft., etarting the drill hole in the face of a crosecut tbat ie 130 ft. in length from the main north and south drift. This gives a total distance of 432 ft. to which explorations have been carried eastward. The last 200 ft. of the drill hole was in quartz, giving low assays, and when the drill was stopped it was still in quartz. The drill might havc been run still further, but it has been withdrawn and a drift will now be eent in along the drill holc, as it has been found that there ie little danger of water. In all the drill tapped what amounts to three miner's inchee of water, which ie equal to 40 gallons per minute. To the west of the main north and south drift a crosscut has heen run a distance of 230 ft., without finding any sign of west wall. This crosscut starts from a point immediately opposite the crosscut and drill holo mentioned above ae running east. Thus at this point it is known that the vein is 662 ft. in width, without any indication of wall in either direction. In the vicinity of the north and south drift has heen opened a width of 26 ft. of base-metal ore that gives paying assays. The water recently struck to the eastward, in the drill hole, is hotter than any heretofore found in the mine, ite temperature heing 135°, whereas before the hottest has been 130° Fahr. It is hoped that the ore may have formed on the east side of the great body of quartz into which they have been drilling—probably out near the hanging wall—therefore they will now drift in that direction.—*Territorial Enterprise.*

BUILDING etone ie manufactured from furnace elag on a large scale at Osnahruck, Germany. One establishment delivered 6,000,000 hriok during the last year. The artificial stone is valuable for ventilation, as it permits four times as much air to pass as ordinary building etone; it also requires 20 times ae long to saturate the etone with moisture as it does bricks baked from clay.

MECHANICAL PROGRESS.

Benefits of Good Tools.

There is an old saying to the effect that "it takes a good workman to make a good job with poor tools." So it does, and there have been many triumphs, recorded and unrecorded, of brain and skill over seemingly insurmountable obstacles. It is a satisfaction to compass a result with apparently inadequate means, and the mechanic who does it is justly proud of his success. But working with poor tools is never certain to produce good results, however great the skill and inventive the brain. Misses are made as well as hits, and even the most self-assured workman feels safer with good and applicable tools. No workman can afford to risk his reputation and success with poor tools; there is so much risk of a failure and such anxiety for the result, that even if success is attained it has been at the expense of time, thought, muscle and trouble that robs it of half its gratification.

The time has gone by when the workman was expected to "make something out of nothing;" when one implement or appliance was made to do duty for another, and "make-shifts," their origination, use and application to the job in hand were part of the kit of the workman. The constant and growing improvement in tools and labor-saving machinery has not only increased the profits of the manufacturer, but lightened the labors of the workman. The machinist who learned his trade 30 years ago would now be ashamed to resort to the wretched substitutes of tools with which he was then compelled to do his work. The carpenter knows the advantages of the mortising machine, the molding machine, the band-saw and other improvements. The blacksmith sees the advantages of the drop-hammer, the shears, the steam-hammer and the portable forge; and even the farmer, who keeps up with the times, appreciates the mowing machine and the many improved hand-tools which facilitate his operations and reduce his labor. There may have been brain energy and labor wasted in the production of improved tools and appliances; for there are some which have never met the expectations of their contrivers or filled the wants of the users. But in truth, there has been no portion or department of mechanical endeavor that has accomplished better results or reached higher success. The number of special tools now used is wonderfully great as compared with 30 years ago. There is no manufacture of consequence that has not its special appliances, machinery and tools, and in tools for general work the improvement has been fully as marked. Even in hand-tools the improvement is obvious to the slightest observation. In every department of industry these improvements have made their mark. They save time and labor, and produce more satisfactory results. It is a wise economy to reject imperfect tools, and, as the patent-medicine men advertise, "use the best." Whenever an improved implement is put into the market—one that will do the work better or quicker—it is economy to buy it, even if the old one is intact and serviceable.—*Boston Journal of Commerce.*

A NEW MEASURING IMPLEMENT.—A remarkable machine was described at a recent meeting of the Societe d'Encouragement pour l'Industrie Nationale, at Paris, called profilograph, because when in use it traces mechanically on paper the outlines of the ground over which it travels. It is described in one of our foreign contemporaries as a small carriage mounted on two wheels, drawn by one man and attended by another, who marks the levels at the proper places; and underneath hangs an iron rod with a large ball at its lower end, serving as a pendulum. This pendulum maintains a constant vertical position, while the machine inclines in one direction or the other according as it ascends or descends a slope. To the upper end of the rod is fitted a pencil, which marks on a sheet of paper the ups and downs of the country traversed, whether on an ordinary road or across trackless fields. The exact profile is thus recorded to a given scale. At the same time one of the wheels, acting the part of chain bearer, measures and indicates the distances traveled throughout the survey. For surveyors and others engaged in leveling operations, this machine would appear to be eminently serviceable, and there is talk of its being made use of in a new general survey of France contemplated by the government.

AN IMPROVED CATTLE CAR.—A St. Louis man has patented a new cattle car. The peculiarities of the invention consist in placing the stock in four racks lengthwise of the car. The racks in each end of the car stand facing each other, and a combination water-tank, trough, and hay-box extends crosswise the car and under the heads of the cattle. Chains or belting fastened to the floor pass up between the stock and are attached to a shaft overhead, which, being turned, draws them tight and holds each animal in place. Water and feed is carried for a trip of four days, and stock can eat, drink, lie down, and rest without the train stopping. Reversing the shaft the stays fall off and drop down. The water-tank is on a roller, and can be easily moved to the end of the car. The car is then ready for any kind of freight.

Alloys of Iron.

M. Pourcel, at the late meeting of the British Iron and Steel Institute, said: Tungsten alloyed with steel appears to harden without detracting from its toughness, but I doubt much whether the advantage gained compensates for the cost. Tungsten is also said to add to the magnetic power of steel, but of this I have no experience. In steel supplied to a Cornish mining company from Sheffield for borers, I found as much as 10% of tungsten. As far as fracture goes, this alloy is the most beautiful of all steels.

I have no experience as to the effect of tin on steel, but a bar of iron made from tin-plate shearings, from which the tin had been to a considerable extent removed, was extremely red, short and unweldable; the amount of tin contained in this sample was 0.15%. Lead and zinc, when added to a bath of steel, are simply volatilized, without producing any effect except that of half choking the melters.

Chromium gives great hardness, but at the same time causes brittleness, and may be put down as useless.

The effect of copper upon steel seems to be greatly exaggerated in most metallurgical works; it is generally stated to cause more red shortness than the same amount of sulphur. In some experiments made at Landore, it was found that 0.10% of copper produced no appreciable effect on the quality of steel; and even when the amount was increased to 0.30%, only a slight cracking on the side of the bloom was observable. This question is, perhaps, more important than appears at first sight. One possible difficulty that soft steel manufacturers will have to contend with will, no doubt, be the scarcity of manganese ores suitable for the manufacture of ferro-manganese, and many good ores might be rejected on account of the presence of copper, a very frequent companion of manganese. At the present time ferro-manganese containing 5% of copper would certainly be unsalable, although, in my opinion, it could be used with impunity.

In conclusion, I may remark that any comparisons made by me of the merits of the two great processes for making steel—*i. e.*, the Bessemer and Siemens—would doubtless be considered prejudiced; but I believe it is now generally conceded that for soft steel the latter carries off the palm, and this I attribute to the complete elimination of the silicon, to the mixture of different brands of pig, and to the absolute certainty with which the carbon in the finished steel can be controlled.

Molecular Changes in Iron and Steel Wire.

A novel and important communication has been made by Prof. Hughes, the well-known inventor of the microphone, to the Society of Telegraph Engineers on the molecular changes which take place in iron and steel wire. He discovered, accidentally, about a short time since, that iron or steel wire, after being dipped for a short time, say two minutes, in a solution of sulphuric acid and water, becomes exceedingly brittle and will not bear bending, the metal becoming "rotten." This is not due to mere corrosion of the surface or skin of the metal, because the wire broke even after the outer layer had been carefully removed. The brittle wire shows no change of magnetic conductivity when tested by the induction balance, such as would be the result of heating, straining, tempering or corroding. There is reason to believe that the suggestion made by Mr. A. Chandler Roberts, that the brittleness is due to absorption of hydrogen by the iron, is the true cause of this peculiar phenomenon. If the wire is immersed in very weak acid, it takes about 30 minutes before it is brittle; when, however, an amalgamated zinc plate is dipped into the same solution and connected to the wire so that a voltaic element is formed, giving off abundant hydrogen at the surface of the iron, the full effect is produced in a minute, owing apparently to the absorption of the hydrogen by the wire. In the latter case, too, the presence of the zinc protects the iron from the action of the acid, and, therefore, demonstrates that the brittleness is not due to a mere surface corrosion. Mr. A. Chandler Roberts has heated the brittle wires of Prof. Hughes in vacuo, and has found that they occlude or absorb about twenty times their volume, irrespective of the "natural gas" in the metal, which amounts to from three to ten volumes of hydrogen and carbonic oxide.

THE *Engineer* says that two Germans have made a new form of machine for separating the turnings and borings of brass and copper from those of iron and steel. The mixed metals fall upon a magnetized drum, to which the iron and steel adhere, leaving the copper and brass to fall into a special reservoir below. There are two cylinders rotating in the same direction, so that the iron which escapes from the first cylinder is retained by the second. The surface of the cylinder is formed by flat hands or strips of soft iron, alternating with strips of copper, and each of the iron bands is in contact with a row of horse-shoe magnets. The adherent metal is removed by revolving brushes.

RAWHIDE is said to make good journal boxes. A practical machinist says: "I have run a piece of machinery in rawhide boxes for 14 years without oil; it is yet good and runs at 4,500 revolutions per minute. I put it in while soft and let it remain till dry."—*American Machinist.*

SCIENTIFIC PROGRESS.

Cutting Cold Steel With Soft Iron.

The development of heat by friction has been long known. For some time it has also been known that the operation of rolling and rubbing had the effect of changing the molecular structure of iron and steel. These operations will toughen and compact cold iron, and will harden and condense steel. Some time since Mr. Jacob Reese, of Pittsburg, Pa., had occasion to construct a machine for cutting bars of cold hardened steel. For this purpose he mounted a disc made of soft wrought-iron upon a horizontal axis, so as to be rotated with great velocity. With any moderate speed no cutting was produced. But, on giving the disc such a speed of rotation as to cause the periphery of the disc to move with velocity of about 25,000 ft. per minute (nearly five miles,) the steel was rapidly cut, especially when the bar to be cut was slowly rotated against the disc. Sparks in a steady stream were thrown off. At first it was supposed that the steel was simply rubbed or ground off; but on examining the pile of accumulated particles beneath the machine, they were found to be welded together in the shape of a large cone, similar to the stalagmites in the limestone caves; they were nearly like the spikes of frost as formed in winter on Mount Washington, and illustrated at Troy meeting. Real fusion takes place. The steel is melted by the swiftly-moving smooth edge of the soft iron disc, but the disc itself is but little heated. The bar of steel on each side of the cut receives but slight heat, and the ends are left with a fine smooth blue finish. By this process a rolled, polished and hardened steel bar of two or three inches in diameter, may be cut in two in a few minutes. The soft metal disc of iron used was about 42 inches in diameter and three-sixteenths of an inch thick. The particles fly off in a thick jet of steam apparently white hot, through which the naked hand may be passed without injury, and a sheet of white writing-paper held in the steam for a minute is not burned nor colored in the least. They glance off without burning the hand, having assumed the condition which causes the spheroidal state of liquids.

The explanation of this curious phenomenon lies in the fact that the very rapidly rotating iron disc causes great numbers of particles of iron to come in contact with comparatively very few particles of steel, every particle of which has to withstand the impact of thousands of iron particles; it thus gives way to superior numbers, this impact at the same time developing heat enough, not only to melt the detached particles of steel, but to bring in the spheroidal state.—*Manufacturer and Builder.*

Why the Needle Points in a Northerly Direction.

Prof. Patterson, Superintendent of the United States Coast Survey, writes as follows in answer to an inquiry by a gentleman as to the reason why the needle points in a northerly direction:

DEAR SIR:—Your note is duly received, and in answer I beg to state that the reason why the needle points in the northerly direction is that the earth in itself is a magnet, attracting the magnetic needle as the ordinary magnets do; and the earth is a magnet as the result of certain cosmical facts; much affected by the action of the sun. These laws have periodicities, all of which have not as yet been determined.

The inherent and ultimate reason of the existence of any fact in nature, as gravity, light, heat, etc., is not known further than that it is in harmony with all facts in nature. Even an earthquake is in perfect harmony with, and the direct resultant of the action of forces acting under general laws.

A condensed explanation in regard to the needle pointing to the northward and southward is as follows: The magnetic poles of the earth do not coincide with the geographical poles. The axis of rotation makes an angle of about 23°, with a line joining the former.

The northern magnetic pole is at present near the Arctic circle, on the meridian of Omaha. Hence the needle does not everywhere point to the astronomical north, and is constantly variable within certain limits. At San Francisco it points about 17° to the east of north, and at Calais, Maine, as much to the west.

At the northern magnetic pole a balanced needle points with its north end downwards in a plumb line. At San Francisco it dips about 63°, and at the southern magnetic pole the south end points directly down.

The action of the earth upon a magnetic needle at its surface is of about the same force as that of a hard steel magnet, 40 inches long, strongly magnetized, at a distance of one foot.

The foregoing is the accepted explanation of the fact that the needle points to the northward and southward. Of course no ultimate reason can be given for this natural fact any more than for any other observed fact in the nature.

C. T. PATTERSON,
Supt. U. S. Coast Survey.

LIME has never been found in a native state; it is always united to an acid, as to the carbonic in chalk. By subjecting chalk or limestone to a red heat it is freed from the acid, and the lime is left in a state of purity.

A SHOWER OF IRON.—Prof. Silvestroke, of Catania, has reported the following interesting particulars concerning a phenomenon lately observed in Sicily: During the atmospheric disturbance in the month of March, 1880, the influence of which was felt in Sicily, with rapid variations of the barometer, there was observed in Catania, for a few hours during the night of the 29th to the 30th March last, a fall of meteoric dust, accompanied by rain. This dust, besides having the red color, mineral and organic particles and minute infusoria frequently observed before on similar occasions, was this time especially interesting, because it contained a considerable quantity of iron, either in a pure metallic state, or in metallic particles surrounded by an oxydized crust. The fragments were of sizes varying from 1 to 10 hundreds of millimeters; some were of an irregular, others of a perfectly spherical shape, as if they had been suddenly fused. All were immediately attracted by the magnet. This fact (discovered for the first time in dust gathered on board a ship in the Indian ocean on the night of the 24th to the 25th of January, 1859, and afterwards confirmed by the illustrious Prof. Nordenskjold on the *Vega* in the Arctic and other seas) is of immense importance to physical and geological science, as proving that iron, which is not known in a pure metallic state on the surface of the earth, is to be regarded as of extra-terrestrial or cosmic origin, establishing a link between the earth and the chaotic material dispersed over the universe; and as being in strict relation with the phenomena of aerolites and meteors. In conclusion, it may be remarked that the dust which fell in Sicily only differs in the size of its metallic particles from a shower of aerolites.

ETCHING ON COPPER.—M. Leon Vida writes to the *Photographic News* as follows: "My attention has lately been drawn to a new process for the production of line or stippled drawings, and as it seems to me to be worthy of notice, I give a short description of it: A copper plate is first coated with bitumen on the turning table, in the same way as in photo-zincography, and when the bitumen is quite dry, an impression from a lithographic stone on transfer paper is applied to it. When this paper is removed, we have a copy of the impression in fatty ink on the bitumen surface. This surface is then dusted with fine bronze powder, which adheres to the inked portions, and renders them quite opaque. If, now, the surface be exposed to the light, the bitumen not covered by the powder will be rendered insoluble. On the plate being placed in some solution which dissolves the bitumen, the copper will be laid bare in the parts not acted on by light. These parts can then be etched in by a concentrated solution of iron perchloride, and when the depressions are sufficiently marked, the action of the mordant is arrested, and all the undissolved bitumen is removed. We have in the end an intaglio engraved plate. This process is very well adapted for line or stippled drawings, but it will not answer for the production of those with half tones."

TYNDALL'S DEFINITION OF THE BRAIN.—The human brain, according to Prof. Tyndall's recent definition, is the organized register of infinitely numerous experiences received during the evolution of life, or rather during the evolution of that series of organisms through which the human organism has been reached. The effect of the most uniform and frequent of these experience has been successively bequeathed, principal and interest, and have slowly mounted to that high intelligence which lies latent in the brain of the infant. Thus it happens, says Tyndall, that the European inherits from 20 to 30 cubic inches more of brain than the Papuan; thus it happens that faculties, as of music, which scarcely exist in some inferior races, became congenital in those that are superior; thus, too, it happens that out of savages unable to count up to the number of their fingers, and speaking a language containing only nouns and verbs, arise at length Newtons and Shakespeares.

TO ASCERTAIN THE MOLECULAR CONDITION OF METALS.—A new and most sensitive instrument for ascertaining the molecular condition of metals has lately been placed in the hands of metallurgists, in Prof. D. E. Hughes' "Induction-Currents Balance." A description of this instrument will be found in the Proceedings of the Royal Society for May, 1879 (vol. 29, page 56). By its means it is possible to detect extremely minute changes of structure, and to compare unknown specimens with any desired standards. In investigations connected with the molecular conditions of steel and other metals, chemical analysis is of comparatively little value, and is at best difficult, tedious, and costly to perform; whereas Prof. H.'s instrument appears to afford the means of detecting not only chemical, but also structural changes of very small amounts.

HOW BIRDS SING.—It seems difficult to account for so small a creature as a bird making tones as loud, in singing, as an animal 1,000 times its size. But it has been discovered that in birds the lungs have several openings communicating with corresponding air bags or cells, which fill the whole cavity of the body from the neck downwards, and into which the air passes and repasses.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 13.		Week Ending May 20.		Week Ending May 27.		Week Ending June 3.	
Alpha	5½	5	7	5	6	5½	6½	5½
Ita	2.30	1½	3.05	2	2.60	2½	2.70	2.40
Andes	75c	60c	1.10	80c	95c	75c	95c	75c
Alps	....	....	....	....	....	....	....	....
Argsnta	25c	15c	25c	20c	20c	....	45c	20c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	2.80	2	3.60	2.85	3.15	2.60	3.15	2.70
Belmont	....	....	55c	25c	40c	....	25c	....
Best & Belcher	8½	....	14½	8½	11½	9½	11	10
Bullion	2.85	2.40	3½	2.95	3½	2.80	3	2½
Bechtel	1.80	1½	1½	1.70	1½	1.30	1½	1½
Belle Isle	50c	45c	50c	45c	50c	45c	50c	....
Bodie	7½	6	7½	7½	8.60	7½	8½	8
Bsnton	1½	1	1.95	1.40	1.70	1½	1.60	1.45
Bulwer	7	5½	6½	6	5½	6	5½	....
Boyle	....	....	....	....	....	....	....	....
Black Hawk	75c	50c	75c	60c	65c	....	65c	60c
Belvidere	2½	2½	2½	2.45	2½	2.40	2½	2½
Booker	40c	30c	40c	35c	40c	35c	40c	35c
Caledonia	35c	25c	70c	40c	60c	40c	40c	25c
California	2.30	2	2.50	2.10	2.30	2.10	2.20	2
Challenge	1.40	90c	1.80	1.30	1.55	1½	1½	....
Chollar	3.60	3.05	4½	3.60	3.80	3½	4	3.30
Confidence	5½	4	7½	4½	6	5½	5½	5½
Con Imperial	35c	30c	45c	35c	45c	30c	35c	30c
Con Virginia	3.05	2½	3½	3	3.15	3	3.45	3
Crown Point	1½	1½	2.20	1½	1.90	1½	1.95	1½
Con Nsahoe	....	....	....	....	....	....	....	....
Chsmpion	80c	70c	75c	60c	75c	60c	70c	60c
Concordia	1	85c	80c	70c	80c	75c	60c	45c
Dayton	....	....	....	....	....	....	....	....
DeFrees	25c	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	55c	50c	55c	45c	85c	70c	80c	60c
Eureka Con	19½	18½	19	18½	18	17½	18½	17½
Exchequer	1.95	1½	2½	1.95	2½	2	2½	2.10
Endowmsnt	....	....	15c	....	....	....	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	70c	50c	1.10	85c	1.10	70c	1	90c
Gila	....	....	....	....	....	....	....	....
Goldsn Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodshaw	70c	55c	95c	60c	75c	65c	1.05	75c
Gould & Curry	3.30	3.20	3½	3.25	4.85	3.35	4.30	3.85
Hale & Norcross	3½	2.60	5½	3.10	4.60	3.60	4.20	3½
Hillside	25c	....	75c	....	....	....	50c	....
Highbridgs	....	....	....	....	....	....	....	....
Homestaks	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independencs	30c	....	25c	....	50c	40c	40c	....
Julia	75c	55c	90c	70c	70c	55c	65c	55c
Justics	90c	75c	1.30	90c	1.15	75c	85c	75c
Jackson	3½	3	3	....	2½	....	....	....
Joe Sactes	....	....	....	....	....	....	....	....
K K Con	4½	....	4½	....	....	....	4½	....
Kentuck	2½	1½	....	....	2	....	2	....
Kossuth	10c	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	15c	....	....	....	....	....	....	....
Lady Wash	40c	30c	60c	35c	40c	....	35c	....
Leopard	....	....	....	....	....	....	....	....
Lewathan	30c	....	30c	25c	25c	20c	....	....
Leeds	....	....	....	....	....	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	20c	10c	25c	20c	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	90c	....	55c	....
Martin White	85c	....	60c	....	....	....	60c	50c
McClinton	40c	35c	55c	35c	50c	40c	65c	40c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	7½	5½	11½	8½	8½	7	10½	7½
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	35c	25c	65c	45c	60c	50c	45c	25c
Northern Belle	11	9½	11½	8½	11½	10½	11½	10½
New Coso	....	....	....	....	....	....	....	....
Navajo	30c	25c	25	....	20c	....	20c	....
Occidental	90c	55c	2	1.20	1½	1.30	1½	1.35
Ophir	8½	5	11½	8½	10½	8½	9½	8½
Oriental	....	....	....	....	....	....	....	....
Overman	1½	1.05	2½	1½	2½	1.60	2.10	1.85
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	30c	....	....	....	....	....	....	....
Potosi	2.80	2.20	3½	....	2½	3	2½	3
Prospect	....	....	....	....	....	....	....	2.70
Raymond & Ely	30c	25c	30c	25c	25c	....	25c	....
Richer	....	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	50c	....	....	....	....	....	....	....
Savage	3.40	3	5	3.15	4.05	3.30	3.55	3.15
Seg Belcher	9	6½	11	8	8	....	8½	8
Sierra Nevada	10½	8	18	10½	15½	12½	16½	13
Silver Hill	25c	10c	1	15c	80c	60c	75c	65c
Silver King	4½	....	4.10	4	5	4½	5½	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	1.30	1.05	2	1.40	1.80	1½	1.85	1.60
Scorpion	1.15	85c	1.80	1.15	1.65	1.10	2	1.60
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	35c	20c	80c	20c	30c	25c	....	....
South Standard	....	....	....	....	....	....	....	....
Star	30c	....	30o	25c	....	....	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	1½	1.10	1½	1	1	95c
Tioga Con	1½	1.55	1.90	1½	1½	....	1.60	1
Tiptop	6½	5½	6½	6	6½	5½	6½	5½
Trojan	10c	....	5c	....	....	....	....	....
Union Con	18½	14½	23½	18	19	16½	22½	18
Utah	6½	5	14	7	10	8½	12½	8½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.30	1.05	1.40	....	1.70	....	1½	....
Wells-Fargo	5c	....	....	....	....	....	....	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	5½	4.10	7½	5	6½	5½	8	5½

Sales at S. F. Stock Exchange.

Thursday A.M., June 3.

120	Alpha		5½@5¾
10	Alta		2.40
100	Andes		.75c
265	Belcher		2.70@2.80
630	B & Belcher		.10@10½
595	Bullion		2.55@2.60
280	California		2.10
435	Caledonia		.25c
300	Don Dorado		.75@.70c
440	Chollar		3.30
580	Con Virginia		3.30@3.40
260	Crown Point		1½@1.55
145	Con Imperial		.35@30c
50	Confidence		5½
50	Essex		1½
35	Excbequer		2.10@2.15
145	Gould & Curry		3.90@3.95
285	Hale & Nor		3.55@3.60
710	Julia		.35@.25c
100	Justice		.75c
220	Kentuck		.2
50	Lady Wasb		.35c
150	Mexican		9½@9¾
250	Mountain View		1½
305	New York		.30@.25c
50	N Bonanza		.25c
40	Ophir		8½@8¾
175	Occidental		1.40@1.35
515	Overman		1.85@1.90
430	Potosi		.2½
800	Quinn		1.40@1.35
50	Seg Belcher		.8
600	Silver Hill		.70@75c
680	Scorpion		1.65@1.70
270	Savage		3.15@3.20
440	Sierra Nevada		14½@15
125	Utah		.10½
350	Union		18½@18¾
310	Yellow Jacket		6¼@6½

AFTERNOON SESSION.			
970	Addenda		1.55@1.70
850	Almon		.50@55c
130	Argenta		.45c
350	Bonton		1.35
100	Black Hawk		.70c
40	Bodie		8@8½
50	Bechtel		1.40
720	Booker		.35@30c
350	Belvidere		3½@3.40
550	Champion		.60@70c
335	Concordia		.60c
15	C Pacific		2½
25	Dudley		.50c
230	Day		.55c
850	D Standard		.40@45c
50	Eureka Con		18½@18¾
200	E Mt Diablo		.50c
500	Grand Prize		.95c@1
3450	Goodshaw		1.30@1.40
50	Hillside		.45c
50	Holmes		.30c
100	Jupiter		1.65
75	Mono		.5
100	McClinton		.55c
205	Mammoth		2.40@2.45
50	Northern Belle		.12
100	Navajo		.20c
50	N Noonday		.5½
400	Orient		.20c
350	Oro		1.65
625	Paradise		.40@30c
700	Queen Bee		.30@35c
200	Summit		.1½
100	Syndicate		.90c
20	S Bulwer		1.40
190	Tioga Con		1.40
395	Tiptop		.7
200	University		.30c
20	Wales		.3½

ORVILLE REED, JR., a graduate of the class of 1877 at Yale college, has accepted an appointment as Prof. of Latin and English literature in Robert college at Constantinople.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	12	1 00	May 12	June 16	July 7	W Willis	309 Montgomery st
Argenta M Co	Nevada	5	25	Apr 28	June 2	June 22	E M Hall	327 Pine st
Booker Con M Co	Usifornia	5	20	May 10	June 15	July 7	W H Lent	309 Montgomery st
Caledonia M Co	Nevada	31	50	May 4	June 8	Juns 28	R Wegener	414 Califonia st
Con Imperial M Co	Nevada	11	10	May 5	June 8	June 28	W E Dean	203 Busb st
Crown Point M Co	Nevada	41	50	May 8	June 11	July 2	J Newlands	203 Bush st
Dudley M Co	California	8	25	Apr 20	May 24	June 22	E O Masten	309 Montgomery st
Gila S M Co	Nevada	7	25	Apr 20	May 24	June 14	W W Parrish	330 Pine st
Hale & Norcross	Nevada	64	50	May 11	June 16	July 8	J F Lightener	309 Montgomery st
Independence M Co	Nevada	6	25	Apr 19	May 25	June 14	E M Hall	327 Pine st
Julia Con M Co	Nevada	12	40	May 12	June 16	July 6	H A Charles	419 Califonia st
Justice M Co	Nevada	32	50	May 22	June 26	July 19	R E Kelly	419 Califonia st
Jupiter M Co	California	8	40	Mar 31	May 4	June 2	E C Masten	309 Montgomery st
Mexican G & S M Co	Nevada	11	1 00	Apr 28	Juns 1	June 21	O L McCoy	203 Bush st
Mackey G & S M Co	Nevada	3	10	Apr 25	June 1	June 21	J M Buffington	309 California st
Modoc Con M Co	——	9	1 50	Mar 18	Apr 26	May 17	J W Pew	310 Pine st
Monte Christo Con M Co	California	3	10	Mar 19	May 8	June 3	B Burris	309 Montgomery st
Ophir G M Co	Nevada	35	1 00	Apr 10	May 13	June 8	C L McCoy	203 Bush st
Overman S M Co	Nevada	45	50	Apr 6	May 12	June 2	G D Edwards	414 California st
Raymond & Ely M Co	Nevada	14	25	Apr 5	May 10	June 7	W L Elliott	328 Montgomery st
Red Cloud Con M Co	Usifornia	7	20	May 11	June 17	July 9	W J Taylor	310 Pine st
Sierra Nevada	Nevada	63	1 00	April 30	June 4	June 21	D L Parker	309 Montgomery st
Silver Hill M Co	Nevada	10	50	April 14	May 19	June 9	W E Dean	203 Bush st
Scorpion M Co	Nevada	7	40	Apr 28	May 7	June 30	Geo R Spinney	310 Pine st
Solid Silver G & S M Co	Nevada	3	25	Apr 13	May 15	June 5	R Hewson	320 Sansome st
South Bodie G M Co	California	3	15	Apr 8	May 12	June 2	H Dess	309 Montgomery st
South Bulwer G M Co	California	7	50	Apr 2	May 5	May 27	W Stuart	320 Sansome st
South Standsrd M Co	California	6	20	April 29	June 3	June 23	C A Sankey	331 Montgomery st
Utah S M Co	Nevada	30	2 00	Apr 28	June 2	June 22	C G Pratt	309 Montgomery st
Yellow Jacket M Co	Nevada	37	1 00	May 5	July 5	July 7	M Otey	203 Bush st
Wells Fargo M Co	Nevada	14	10	May 26	June 28	July 19	A Colburn	318 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Argonaut M Co	Arizona	1	03	May 26	July 3	July 24	J Pentecost	702 Market st
Atlanta M Co	Utah	1	05	Jau 2	June 24	July 19	A F McGrew	420 Montgomery st
Atlas M Co	Utah	1	20	May 19	June 23	July 14	A F McGrew	420 Montgomery st
Black Rock M Co	California	3	15	Apr 2	May 21	Juns 21	N T Root	225 Beale st
Concordia M Co	California	3	15	Juns 1	July 8	Aug 2	Wm J Taylor	310 Pine st
Defiance G M Co	California	5	25	May 20	June 28	July 21	W H Lent	309 Montgomery st
East Mt Diablo M Co	Nevada	1	10	May 7	June 14	July 6	G W Fisher	324 Pine st
Excelsior Deep Gravel M Co	California	10	10	Apr 21	May 24	June 15	D F Verdenal	327 Pine st
Fairfax M Co	Nevada	2	20	Apr 7	May 26	Juns 16	O C Miller	324 Pins st
Gover M & M Co	California	42	20	May 5	June 21	July 14	W O Wilson	402 Front st
Hillside M & M Co	Nevada	3	30	Apr 9	May 12	June 7	F Frankenthal	330 Pine st
Morgan M Co	California	7	50	May 14	June 21	July 13	J J Raphael	533 Kearny st
Monte Cristo Con M Co	Usifornia	3	10	May 26	July 5	Aug 5	Butler Burris	309 Montgomery st
Mt Potosi Con M Co	Nevada	3	2 50	May 11	June 14	July 6	E A Holmes	318 Pine st
Murchie G & S Co	California	3	25	Apr 20	May 21	Juns 21	S D Rodgers	328 Montgomery st
Northern King M & M Co	Arizona	4	20	May 14	Juns 19	July 12	E A Holmes	310 Pine st
Original Keystone S M Co	Nevada	5	50	May 26	June 29	July 22	F E Luty	330 Pine st
Ore Blanco M Co	Arizona	1	20	May 3	June 7	June 28	W O Gould	220 Sansome st
Paris M Co	California	1	10	Juns 1	July 7	July 30	Wm J Taylor	310 Pine st
Swamp Angel G M Co	California	1	12	June 2	July 24	Aug 12	Chas W Badger	315 Usifornia st
Vanderbilt M & M Co	Nevada	1	15	Apr 12	May 20	June 16	J Morizio	328 Montgomery st
Wide Awake M Co	Arizona	10	05	May 22	July 1	July 20	C Hildebrandt	232 Sutter st
Wyoming Coal M Co	Wyoming	2		April 21	June 10	July 10		
Wyoming & Dakota W Co	Dakota	2	1 00	May 6	June 16	June 30	T Wldmau	404 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alpha Con M Co	Nevada	Wm Willis	309 Montgomery st	Annual	Juns 21
Bodie Con M Co	California	Wm H Lent	309 Montgomery st	Annual	June 7
El Tesoro S M Co	——	W H Clickering,	214 Sansome st	Annusl	June 15
Lady Franklin G & S M Co	Nevada	F E Luty	330 Pine st	Annual	June 7
Mammoth M Co	California	A W Rose, Jr.,	302 Montgomery st	Annual	June 15
St Louis M Co	——	W E Dean	Nevada Block	Annual	June 7
Randolph Con M Co	California	W W Bausman	409 California st	Special	June 15

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Q M Co	California	W L Oliver	Safe Deposit Bldg	25	May 16
Cherokee Flat Blue Grav M Co	Cal	R N Van Brunt	318 Pine st	4 25	Mar 13
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	May 20
Father Do Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	50	Apr 24
Idaho G M Co	California	C Meade	324 Pine st	2 00	Apr 9
Natoma Water & M Co	California	——	——	2 00	Apr 5
Northern Bell M Co	Nevada	W Willis	309 Montgomery st	50	May 15
Ontario M Co	Utah	——	——	50	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12
Seventy-six S M Co	Nevada	E F Stone	306 Pine st	03	May 24

The Mining Share Market.

There is no noticeable change in mining shares since our last issue. The Boards adjourned on Saturday until Tuesday, and it was reasonably expected that there would be an accumulation of orders during the long interval. This expectation was realized in a measure, for the transactions of Tuesday were large, particularly in the north end shares. Since then both transactions and prices have gradually declined. The advices from the mining districts continue to be favorable, and the indications for a development in one or two of the leading Comstock mines appear to grow better from week to week. When the long-hoped for news does comes it will be an agreeable surprise.

Important discoveries and strikes continue to be announced. Not the least interesting of these come from the quartz and gravel mines of California, and it must be conceded that the mining situation is brimful of promise.

ACTIVITY IN RAILROAD BUILDING.—The construction of railroads in the United States has received an immense impulse since the revival of general business. Few of our readers, we venture to say, have any adequate conception of the magnitude of the work that is doing in that field. The N. Y. *Bulletin* states that, since the 1st of Sept. last, and up to the 25th of March, nearly 3,000 miles of new road had been constructed, and no less than 12,641 miles of new road projected. The same rate of progress continued during the remainder of the present year, would bring the figures of railroad construction very nearly, if not quite up to those of the extraordinary years 1871 and 1872, immediately preceding the financial crisis of 1873. If, however, the country should experience no financial derangement during the current year, there is little doubt that the larger part of the new undertakings referred to, will be carried well forward. They will greatly increase our transportation facilities and the distribution of population, commerce and industry.

A PARTY of colored people have returned to Georgia from Liberia, and they pronounce that "promised land" of their race a delusion and a snare. An industrious colored man is better off in the United States than any where else in the world.

The Felton Railroad Disaster.

The coroner's inquest into the causes of the recent fatal disaster concluded its labors, May 31st. The jury agreed as to the number and description of the dead, but disagreed on the important question of the cause, and presented three reports. The first report gives a synopsis of the voluminous evidence, and then proceeds as follows:

"From the foregoing facts we make the following findings: First, that the Gen. Supt. of the road is blamable for the make-up of the train, and intrusting it to men, young, and to some extent inexperienced, neither of whom in the discharge of such duties, had before passed over that section of the road in charge of a train; second, it is difficult to find what an engineer in charge should have done in such an emergency, bnt from the testimony we believe that he did not handle his train with the skill of a more experienced engineer; third, we believe that the train officers did not exercise that care and prudence they should have done cousidering their want of knowledge of the road, the condition of the same, and the heavy grade they were descending; fourth, we believe that all persons who had charge of the road in maintaining its alignment and grade are blamable for letting that sharp curve remain on that section of the road without having notified the train men, and thereby have avoided the probability of an accident." This conclusion is signed by Elihu Anthony, T. W. Wright and E. Bernheim. The second report is without any preliminary remarks, and has the followiug: "We, the undersigned jurymen, do futhermore find and return that, according to the testimony given in evidence before us, said accident resulted from nnforeseen causes, and that the same are to us unknown." This is indorsed by John C. Toll, P. E. Tilden, Silas Felker, Chas. S. Eastman and J. A. German. Benjamin Knight, Sr., makes a brief *resume* of the testimony, and concludes by saying: "I find that the acting engineer was incompetent for want of knowledge of the road, and short experience as an engineer; and I further believe that if there be blame to be attached to anyone or more persons, it should be investigated and determined by the Courts."

THE oldest living graduate of Harvard college is said to be Joseph Head, who was graduated in 1804.

MINING SUMMARY.

This following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MINING NOTES.—Amsdor *Sentinel*, May 26: Ths Newton copper mine appears to bs prospering. The mssons are at work on 10 new roasting pits. Ths Stewsrt & Gillick mine, at Volcano, bas besn finslly sold to Lyls & Co., of S. F., for $30,000. At Olets the Jupiter mine, at a depth of 55 ft, bas a ledgs 5 ft wide of free gold-bearing ore, which, by mill process, shows $51 to ths ton. A new shaft is being sunk near tbe Zeils mill. The lead was discovered wbile ths mill was helng built. The contract is for sinking 50 ft, at $9.50 psr ft.

BUTTE.

HEAVY BLAST AT CHEROKEE.—*Mercury*, May 28: Supt. Waldyer fired a big blast in ths works of the Spring Valley Hydraulic Gold Co., at Cherokes, Monday. Ths charges consisted of 25,000 lbs of Judson powder. Two shafts were sunk to a depth of 125 ft each, from the hottom of which a T extended 40 ft each way into the mountain. At ths ends of ths T's 6,500 lbs of ths powder was deposited; an electric wirs ran from each chsrge to ths surfacs, whers connection was made with ths msin wire running from ths instrument. The T's and shafts were tightly packed with dirt. At 11 o'clock ths signal was givsn Louis Glass to striks ths electric spsrk. Instantsneously tbe facs of the mountain, which was about 250 ft high, raised upward and outward for a distance of 300 ft back from tbe face and settled in a thoroughly demoralized condition. A low rumbling noiss accompsnied ths explosion, and a hugs cloud of dust arose as ths enormous mass partially toppled and fell onto the plateau in front. At a distance of 500 ft back from ths shafts, on the top of the mountain, gigantic osk trees tremhled liks aspen leaves, the earth seemed to psrties standing on it to raise upward about 1 ft, and the shelving table rocks jlngled together liks dice in a box. Competent judges estimate the amount of dirt loosoned and displsced by ths explosion at 500,000 cubic yards. The success of ths blsst is perfectly satisfactory to the muagement and exceeded their expectations.

STRUCK A BONANZA.—W. W. McMillan, of Evansville, has for years devoted his spare time to prospecting in ths strip of country lying bstween Bangor snd Boeton Ranch. His efforts were last week crowned with succes, he finding a ledgs of rich quartz. Thres tons of the rock were crusbed, the result being a yield of $200. The vein is six inches in width.

CRYSTAL HILL QUARTZ LEAD.—*Register*, Msy 29: Mr. Wagonsr, who for ths past two years has been prospecting what is known as Crystal Hill quartz lead, in Mountain Spring townsbip, has his mill now running and crushing rock taken from this lead, which yields sufficient returne as to justify him in continuing work. It is his intention to build another mill, nearer the claim, and open the mine in ths best possible manner. The richness of this quartz has never besn a question, but in all previous attempts at working the rock the parties have been unable to save the gold.

CALAVERAS.

BOSTON MINE.—*Chronicle*, May 20: The work of hsuling the lumber for the 25-stamp mill to he erected on the Boston mine, in Buckeye gulch, is in progress, and the work of putting up the mill will he commenced this week.

EL DORADO.

PLACERVILLE G. Q. M. Co.—*Republican*, May 21: It takes money and time to open a quartz mine. The Placerville G. Q. M. Co. kept a force steadily at work over a year before 1 lb of rock was worked, and nearly two years before they built a mill, but the result was a three years' supply of ore in sight for 20 stamps.

ANOTHER MINE SALE.—The mine formerly known as the McNulty and the Tingman, now known as the Electric, near the old Springfield mine, Mud Sprngs township, has been sold to F. Tagliahue and others of S. F. This mine is upon the mother lode, is now down a littlo over 200 ft, and $156,000 bave heen taken out since it was first opened. There is a quantity of fine ore already out. The mill will he started up at once.

SARDINE MINE.—Greenwood Cor. *Republican*, May 21: Mr. Thos. Simous is making good headway with the shaft; the rock still is very hard, hut breaks out much hetter than it has hitherto done, and Mr. S. tells me that he will very shortly he able to commence drifting for his pay gravel. The river is high, and will be so till well into the summer.

MINING NOTES.—The claim holders on the seam bclt, north of the Bower mine, are busy prospecting their several locations; notably so Messrs. Jacob Nagler and John Smith, who have just put in a new flume, pipe, etc., and now have their mine in good order; and also Mike Muntz & Co., whose prospects are amongst the best; while Mr. Van Bremeu's claim is being actively operated as usual.

MINING NOTES.—*Mountain Democrat*, May 29: Prof. Price, with a corps of engineers and workmen, has been husily engaged in laying off the ground and preparing for the erection of works and the prosecution of active mining operations at the Epley mine, near Ringgold. The P. G. Q. Co.'s fine new mill is steadily crushing from 30 to 35 tons every 24 hours, of ore that is of extremely uniform quality, averaging about $18 per ton. The negotiations are about concluded for the transfer of the immense gravel deposit at Diamond Hill to an S. F. company of abundant means. Griffith and Hart are pounding away at a lively rate, and with satisfactory results, in their newly-erected mill near Nashville, on ore from their Montezuma mine.

ROSE.—This mine is turning out its regular quota of good ore, a large portion of which appears to he of high grade.

GRIFFITH CON.—Slowly hut surely the pumping apparatus is gaining on the inflow of water at the Griffith Con., and within a short time that large and rich ledge will he in a condition to yield rich returns.

OLD HARMON MINE.—Mr. Plaisted, the recently arrived representative of the Eastern company that bought the Old Harmon and adjacent mining properties, is engaged in methodical preparatious for working those mines.

INYO.

DEEP SPRING DISTRICT.—*Independent*, May 22: There are now about 20 prospectors in Deep Spring district, and locations of promise are being made daily. As yet, however, it is a prospector's camp, no permanent work having been commenced. Operations are of an exploratory nature, in distinction to work of development. Many of the prospectors are interested in more than one claim, and are engaged in doing the necessary work to hold the various claims; consequently the development of the district is retarded.

DEFIANCE FURNACE.—The Defiance furnace commenced running last Monday on ore from the Custer, taken out by Gorman & Eddy, and has produced about 10 tons of bullion every 24 hours. The New Coso commenced running on the same date, and is making a splendid run.

ITEMS.—Billy Lake, who left here some two weeks ago to do some prospecting in the White mountains section, has succeeded in discovering a 3-ft ledge of average grade silver ore. It is pleasant to note that two of the Darwin furnaces are once more in full blast.

MONO.

DRAKE DISTRICT.—Bodie *News*, May 25: On Sunday last our reporter visited the scene of the latest excitement, Rough creek, now called Drake mining district. This is a new district lately organized in order to avoid all doubt as to the district in which these mines are located, there being some dispute upon that point. Rough creek, in a direct line, lies about 3½ miles from Bodie. The country has the appearance of a fine mineral-bearing region. The ledges are large and crop holdly above the surface, and can he readily traced for miles. A singular and promising feature of 18 ledges, from which the reporter with his

pick took samples from the croppings, showed free gold, while the same rock by assay went from $30 to $200 per ton, 60% silver. Bodie is well represented in this new district. There have been 27 claims recorded. The locating of several claims by the same parties is wrong. It is always this spirit of greed that holds in check the development of any mining camp, and the laws of the district should make provisions against this serious drawback.

DIANA MINE.—*Bentonian*, May 17: At the Diana mine everything is bustle and activity. By the end of this week the roads leading to the new hoisting works will be completed, the foundation for the engine house graded, and perhaps the shaft, being raised from the Kerrick, will be finished. At 6 o'clock this morning another body of rich black ore was struck in the shaft being raised. This rich vein of ore is from 3 to 12 inches in thickness, and lies probably less than 40 ft from the surface.

WHITE ROSE MINE.—A solid body of ore has been struck in the head of the tunnel and about 60 ft below the bottom of the shaft. This body of ore has been penetrated a distance of 5 ft, and there is no evidence as yet that it has been passed through.

INDIAN QUEEN.—Mammoth City *Herald*, May 22: Wm. Adams, Jr., has been paying Lake district a visit, and from him we gather the following items of interest as to what is being done in that section: Tunnel No. 5 of the Indian Queen is now in about 1,500 ft; it intersects and follows the vein at a vertical depth of about 500 ft. The ledge is well defined and most of the distance stands at an angle of about 25°. There is on the dump about 40 tons of the usual quality of high-grade ore; there is also exposed about 600 tons more. The mill will be ready to start about the 1st of July, with a good prospect for a steady run all season.

LAKE DISTRICT.—*Herald*, May 20: In the Mammoth during the past week 34 ft were driven, giving a total length of tunnel of 1,383 ft. The ore dump has been moved down the side of the hill from No. 2 to No. 3 tunnel, and the tramway is now being overhauled and put in working order. The air compressor and Burleigh drills will be started up again in a few days, and work resumed in No. 3 tunnel. An upraise will be started to prospect and ascertain the extent and value of the body of decomposed ore found in the Hardy winze. A regular system of crosscutting the ledge at short intervals will soon be inaugurated in No. 4 tunnel, which will give an exact knowledge of the size and value of this remarkable ore fissure.

LAST CHANCE.—The McCarthy Bros. and Jas. Patterson have the Last Chance shaft down 30 ft, and they expect to be in their ledge in about 15 ft. Assays of ore taken from near the croppings of this ledge last year went as high as $78.

U. L. & M. C. JOINT TUNNEL.—Everything is running along smoothly about these works. The rock is still hard. Distance made since last report, 56 ft; total length of tunnel, 756 ft.

GENEVA.—Jas. Argall and Clint Joyce have commenced work in earnest on the Geneva mine. They have their tunnel in 42 ft, and expect to strike the ledge in about 20 ft more.

MARIPOSA.

VIRGINIA MINE.—Coulterville Cor. *Gazette*, May 28: The Virginia, formerly known as the Captain Aiken mine, is about 4 miles southeast of Coulterville, and is now the property of Mr. J. W. Coe, of N. Y. Mr. C. purchased the property last Sept., and has since erected an 8-stamp mill on the mine, which has within the last 00 days, with actual running time of 35 days, produced at least $20,000. In the main shaft, which is down about 80 ft, they have, in the past 24 hours, made a wonderful find in the vein of gold in large flakes and stringers, from which, as I am informed, they have taken out at least $10,000.

POTOSI AND MALVENA MINES.—The Cook Bros. are running a tunnel on the Potosi, adjoining the old Malvena mine. Twenty years ago the Malvena was deemed to be rich with gold and considered very valuable. The same company is sinking on the Malvena No. 2, with an encouraging prospect before them.

BANDERITA.—Mr. P. P. Mast is running a tunnel from the Banderita mill to strike the vein 400 ft below the old works. It will, when completed, be about 1,500 ft long. The Banderita is one of the permanent paying mines of this section.

MARTIN & WALLING.—Mr. Mast is also owner of the Martin & Walling mine, which is well established and generally conceded to be a first-class mine. It is worked from a shaft sunk on the vein about 300 ft deep by a 40-horse power engine attached to the hoisting works, which has just commenced operations.

MINING PROSPECTS.—Stockton *Independent*, May 29: Senator Pool, of Hornitos, is in town, and reports the mining interests of Mariposa county booming. Capital from the East and elsewhere is taking hold of Mariposa mines. A N. Y. company, owning the No. 0 mine, about 2 miles from Hornitos, has put up machinery and is beginning work on a large scale. At the Pool mine, about 1½ miles from Hornitos, a new American arastra is crushing about 10 tons of rock daily, and paying handsomely. A S. F. company has taken hold of the Silver Lead, and is erecting new machinery, and a good account is expected of the rock now on the dump. The Senator also informs us that he has it on good authority that a settlement has been arrived at concerning the Fremont grant, and that the company will, in a short time, either grant leases or work the mines on the grant themselves.

NEVADA.

MEADOW LAKE.—Truckee *Republican*, May 20: Those who have held to their locations in Meadow Lake through all its ups and downs are now more than ever confident that they have a good thing. There is going to be a revival in the mining interest there this summer. A company of gentlemen from this place, who own a mine there, worked 12 tons of rock last season and obtained $1,800 therefrom by mill process. They simply roasted the rock before crushing, and had no difficulty whatever in extracting the gold. They propose working extensively this summer as soon as the snow disappears. They feel confident that a number of the mines in that locality will prove equally as valuable when worked in the same manner. We learn by letter from Hon. James Wasson that the State Mineralogist is likely to put a man in the field there to investigate the character of the veins and their formation some time this summer. There are some capitalists of S. F. also propose to prospect quite extensively there this summer.

QUARER HILL.—Dutch Flat *Forum*, May 20: At this new mining camp the mining interests are reported to be in a prosperous condition. Sargent & Jacobs are employing about 20 men. Last week a tunnel, 20 ft below the upper one, was started, and about 50 tons of gravel are moved daily. This is taken from the mine, hoisted through the shaft and crushed at an expense of about $1.50 per ton. Some of the cement taken from the mine pays as high as 25 cents a lb. The new shaft, it is believed, will disclose some very rich gravel, as it extends along a bar of an ancient river channel. The machinery is all driven by water power, there being 3 hurdy wheels in operation—1 for hoisting the gravel, another for milling and 1 for pumping, the latter is kept constantly running. The company has a hydraulic mine close by which employs about 20 men, and is kept in constant operation.

BANNER MINE.—Nevada City *Transcript*, May 27: Although about 40,000 shares of the recently-incorporated Banner quartz mine of this district have been disposed of in the East, the principal owners here are now making an effort to withdraw the property from that market and recommence work on the claim with the aid of local capital alone, and have instructed the N. Y. agent to recover the stock already issued, if it can be accomplished, by paying a reasonable bonus. A little experience has shown that the laws of N. Y., under which the incorporation was effected, are not so well calculated for speedy and effective operations as those of this State; furthermore, the Banner has such a good reputation that there are several moneyed men in the vicinity who are anxious to take hold of it with their neighbors.

SAILOR FLAT.—The Sailor Flat company, whose hydraulic mine is at Blue Tent, came to town yesterday with $10,000 worth of bullion. This was a partial clean-up after about 450 hours run on top dirt with 2 monitors. The company has not yet worked any of the bedrock in its claim, and is said to have the richest top dirt to be found anywhere in the State, excepting that around Columbia Hill, in this county.

SOUTH IDAHO.—Grass Valley *Union*, May 21: This mine is about 300 yards southeast of the Idaho, and a shaft has been sunk which strikes the ledge at a distance of 75 ft from the surface. The ledge is about 7 or 8 ft in thickness, and carries gold and plenty of sulphurets. The mine is owned by Grass Valley and S. F. parties, and it is understood that a contract will soon be let to sink the shaft 100 ft deeper and crosscut at that point through the ledge.

PLACER.

EMPIRE MINE.—*Foothill Tidings*, May 20: The engines are at work at this old mine. The owner, W. H. Bourne, of S. F., was here this week, and it is understood that the mine will be relieved of water to the bottom, below the 11th level, and the main incline be continued downward. This is the oldest steady-paying mine in Grass Valley, and we are glad to note this resumption of work.

CONRAD MINE.—*Argus*, May 29: Messrs. Roberts, proprietors of the Conrad mine, are doing splendidly. They lately finished a 3-ft. run at Salmon & Pelster's mill—which they have leased for 3 months—and cleaned up nearly $2,200, an average of $100.50 per ton.

CRATER MINE.—The Crater mine, at Ophir, 4 miles from here, has taken out over $53,000 in 4 months, and it is now said to be doing even better than that. There are between 30 and 40 men employed there.

THOAP & CO.'s shaft, on Duncan hill, adjoining Roberts & Co.'s claim, is down 215 ft on the ledge. A tunnel is being run from the surface of the hillside lower down, to tap and drain the shaft.

MR. SHURTLEFF's mine is on the other side of the Conrad, and immediately adjoins it. The last crushing, a few weeks ago, paid quite well.

SIERRA.

HYDRAULIC MINES.—*Mountain Messenger*, May 29: Work in hydraulic mines is pretty generally well under way. At St. Louis and Howland flat, water is plenty and work is progressing rapidly.

GRAVEL MINES.—We understand that the 1001 gravel mine, above Sierra City, commenced washing on Wednesday. The company do not look for any very remarkable returns, as they have only the gravel taken out in running the tunnels necessary to prospect the mine. No breasting has yet been done. The Con. G. M. Co. has been sold. The claim comprises 450 acres of the most promising gravel mining ground in the county.

TUOLUMNE.

JAMESTOWN.—Cor. *Independent*, May 29: They have made a rich strike at the Barry mine, Quartz mountain, and in the Moony claim on Whisky hill.

GOLDEN ROCK.—The recent clean-up at the Golden Rock gravel mine, after a 30-days run, yielded $2,000. This run was made under many disadvantages.

OLD TUOLUMNE.—Work has been resumed on this mine, 2½ miles northeast of Columbia. There are a number of shafts and cuts along the vein, all showing splendid prospects. One shaft is down 100 ft in good ore, carrying sulphurets and free gold. It is the intention to start a tunnel from the main river, on the vein, which will give several thousand ft of backs, and make a mine that will last for an age.

NEVADA.

WASHOE DISTRICT.

SCHEEL MINE.—*Territorial Enterprise*, June 1: This mine is situated to the southward of the Forman shaft, and is owned and worked by Herman Scheel. He is his own Supt. and Board of Directors. The vein in which he is working is about 100 ft wide, and contains 3 pay streaks—one 2 ft, one 8 ft and another 14 ft in width. The large ore streak contains the most silver, but the smallest is the richest, carrying more gold than the others. The mine is worked through tunnels, and a 2d level has just been opened, which shows improvement over the 1st. In the bottom of this last level a winze will soon be sunk, when it is expected that still richer ore will be encountered than any above. The ore now being extracted runs from $30 to $120 per ton. Mr. Scheel says his mine is open for all who wish to take a look at it.

QUINN.—*Chronicle*, June 1: It is reported that a rich strike was made yesterday in the crosscut on the 200 level of the Quinn. The specimens exhibited are black sulphurets, stephanite and ruby silver. The edge of the ledge was cut into last Saturday, and the crosscut was driven some 8 ft in low-grade ore, when the rich ore mentioned above made its appearance. The specimens of ruby silver are the handsomest ever found on the Comstock. The black sulphuret ore is said to assay as high as $800, and the other specimens are of course nearly pure silver. Nothing is yet known about the width of the ore body on the 200 level, but should it prove of no greater width than it was on the level above, it is estimated that the ore known to exist from that point to the surface is worth not less than $700,000.

HALE & NORCROSS.—Letter of May 28th says: Sunk incline 28 ft and placed 3 sets of timbers. Finished cleaning up 2100 level and started a small drift south, which shows bunches of ore. Will have an average assay made for my next weekly report; 3 men are working at this point. Have secured 2200 south drift and reduced the temperature to about 120° Fahr.

CON. IMPERIAL.—Letter of May 30th says: Started Alpha-Imperial joint drift east from station on 2800 level; have advanced same 10 ft; face in porphyry. Are still engaged in digging water drain in main lateral drift, 2800 level.

GOULD & CURRY.—Letter of May 30th says: The joint shaft has been sunk and timbered 35 ft since last report; total depth, 1,190 ft.

AURORA DISTRICT.

THANKSGIVING MINE.—Dispatch to Bodie *Free Press*, May 27: The Thanksgiving mine has been sold to-day to New York capitalists. Work has been commenced on the property to-night. Ore will be extracted and milled as early as possible. The company also purchased a mill site, on which a 20-stamp mill will be erected.

HOISTING WORKS.—During the present summer hoisting works will be erected on Middle and Last Chance hills, and in a short time we expect to vie with Bodie.

CHERRY CREEK DISTRICT.

BOHEMIAN GIRL.—Cor. White Pine *News*, May 25: The Bohemian Girl mine is situated in what is known as the upper belt, in this district, between the Teacup and Pine Nut mines, and is owned by Messrs. Barrick & Griswold, who have done a considerable amount of work upon the property with their own labor, sufficient to demonstrate the fact that they have a perfect formation, a strong vein, carrying mineral, with some rich ore in sight, and with a reasonable expenditure of money in the development of the property, its owners would be likely to reap a handsome reward.

ITEMS.—The Star mill started up May 24th, after having been shut down a couple of days for repairs. The Schellbourn mill is still running, although it is evident that the company would find it more profitable to dry crush their ore.

ESMERALDA DISTRICT.

ESMERALDA MINE.—*Herald*, May 29: Work will be commenced on this mine in a few days. Ore will be taken from the mine and piled on the dump to await the building of the mill that is now sure to come. It is the intention of the managers of the Esmeralda to put on only a small force at present, but when the mill is put to work, a large force of men will be put on, and the ore will be extracted as rapidly as possible.

EUREKA DISTRICT.

BANNER MINE.—*Sentinel*, May 27: Work on the Banner mine will be resumed to-day, by the McGarry Bros. and Mr. Kelly, of the company. They propose to prosecute developments vigorously during the season. The Banner is one of the best known and defined mines on the mountain, and has a first-class record, having yielded perhaps a larger amount of ore than any mine in its vicinity. The main shaft has reached a depth of 350 ft, showing a perfect fissure vein all the way down. There is no better prospect than the Banner in this district.

I X L DISTRICT.

NEW DISCOVERY.—*Silver State*, May 26: J. W. Richards, of Churchill county, just up from I X L, informs us that a new discovery was made in the mines a few days ago, which seems to be richer than anything hitherto found in the district. He predicts a bright future for I X L.

PARADISE DISTRICT.

GLORY MINE.—*Reporter*, May 29: The first batch of ore from this magnificent prospect was worked at the Sedan mill on Friday, and gave a battery assay of $172.79. Although this result is very satisfactory to both owners and lessees, much better figures would have been got if more attention had been given to sorting.

PARAGON.—This mine is being rapidly developed, and is employing a force of 50 men. The line shaft of the mill broke down again during the week, but the mill ran on tailings and no time was lost.

BULLION.—The mine is being thoroughly overhauled, and is employing a force of 20 men. The mill is running on 3d-class ore, and has crushed daily, for the past 14 days, 20 tons, which has been worked to 80% of the battery assays.

MOUNT ROSE.—The drift is still in good ore, and the mine is looking well. Negotiations are pending between the Mount Rose and Bullion companies for working the ore from this mine at the Bullion mill.

PROSPECT MOUNTAIN DISTRICT.

NAME OF DISTRICT CHANGED.—Eureka *Sentinel*, May 23: The great fire of 1879 having destroyed the records of Spring Valley district, the miners of that district recently changed its name to Prospect Mountain district, by which it will be known hereafter. During the summer a number of the mines of the district will be worked, as many of the old locators are now upon their mines engaged in taking out ore.

WILLOW CREEK DISTRICT.

PROSPECTS.—E. P. Torrey returned from a visit to the Willow Creek mines. He says there are several fine prospects in the district, but none of them have been developed to any great extent, except the Ohio, which he considers the best mine ever opened in the county.

ARIZONA.

TOUGH NUT.—Cor. Yuma *Sentinel*, May 20: Discoveries on the 113 level in the Tough Nut show a solid body of ore 20 ft wide.

GOOD ENOUGH.—In the Good Enough on the 100 level, from a single cross drift, they are taking out 15 tons of very rich ore a day. The prospects all show this mine to be truly wonderful. Since the 20th of May the bullion produced is 100 bars, valued at $206,000.

RICH DISCOVERY.—In the San Jose mountains, 25 miles from Charleston, gold croppings assaying $18,000 per ton have been discovered. These croppings are near the claim of J. H. Slaughter, who has a vein of gold quartz 4½ ft wide at a depth of 35 ft, which assays way up in the thousands.

HOLLAND MINE.—The Holland mine, Patagonia mountains, at a depth of 80 ft assays $177 in silver and 57% lead. They have 25,000 tons of ore on the dump. This mine is owned by the Holland M. & S. Co., of N. Y., who have a 30-ton smelting works ready to put up, and will be in operation in 40 days.

BRADSHAW MINE.—Tenney and Newton, of S. F., have bonded the Bradshaw, located two miles from Charlestou, for $40,000. They have 2 ft of ore at a depth of 60 ft, averaging $400 per ton.

WARSAW MINE.—The Warsaw, owned by the Grion Co., of Philadelphia, is one of the best developed mines in the district. There is great deal of work being done in the district.

MCCAFFERTY MINE.—This is considered one of the great mines in Arizona. It has a shaft down 200 ft, showing very rich ore.

DOS AMIGOS.—This mine has a shaft 75 ft deep, and yields ore assaying from $40 to $1,400 per ton.

CAVINESS MINE.—In Mineral Hill district rich strikes are reported. A shaft 100 ft deep in the Caviness shows fine bodies of ore, and a tunnel 207 ft along the ledge shows ore all the way. It assays as high as $30,000 per ton in silver and some gold.

BLACK BILL.—This mine is down 95 ft, with a 17-ft ledge, the ore from which assays up in the hundreds.

WEST RICHMOND.—This mine, in a shaft on the vein at the depth of 20 ft, struck a rich body of ore, copper silver glance, that mills upwards of $7,000 per ton.

RICH ORE.—The Silver Gulch, Victoria and Blue Cap are developing fine bodies of rich ore, which, with the fine location for mining, makes the basin a very promising locality.

PRINCESS MINE.—The main shaft in the Princess is down 90 ft and looks splendid. This shaft follows the hanging wall down, and is in a continuous vein of ore all the way.

RED CLOUD.—Work on the Red Cloud has been suspended for a few days, but will commence again immediately.

COLORADO.

WHITE QUAIL MINE.—Leadville *Herald*, May 23: A very important strike has been made in the White Quail mine, at Ten Mile district. There are 1,500 tons of ore mined at this claim at the present time, and the regular production is now from 20 to 30 tons daily. This has been fair-grade ore, but last week, in the incline running from the north level from the tunnel, some very rich ore was struck.

ROBINSON MINE.—This mine is piling up immense amounts of valuable ore, awaiting the completion of the smelter and the drying up of the road to Lesdville. Work is being driven on the new smelter, which will be of 50 tons daily capacity. The roasters are kept busy in concentrating ores, but can handle but a small portion of the amount produced.

SNOW BANK.—The strike on the Snow Bank, made about 2 weeks ago, has proved a very important development for the camp, and has greatly encouraged mine owners in the vicinity. Two hundred tons of ore, rich in both lead and silver, have already been mined.

BUENA MINE.—*News and Courier*, May 28: A Philadelphia company is working the Buena mine, at Jamestown, day and night, giving employment to 10 men, engaged in sinking shafts and drifting to disclose the ore. One shaft is sunk to the depth of 85 ft; another 55 ft. This is a tellurium vein of the 1st water, judging from the mill returns, the last run of 1st-class ore yielding at the rate of $5,280 per ton.

GOLDEN AGE.—This well-known mine is now employing a small force in sinking shafts and opening up the mine. At the bottom of the main shaft, 300 ft deep, there is disclosed a vein of free gold milling ore over 4 ft wide. From this a crosscut has been run 35 ft to the footwall, there cutting a streak of smelting ore.

CARIBOU MINE.—This mine, through its Nederland mill, sends for shipment an average of $5,500 per week in silver bars.

BONANZA GROUP.—This location covers 4 veins of free gold ore. One shaft is down 53 ft, and the ore is claimed to carry from $50 to $100 per ton, all the way down. This property is reported as about passing into the hands of a N. Y. company.

NI-WOT MINE.—This mine is producing 300 ounces of gold per month, from the regular running of 25 stamps. The ore way worked is 10 ft wide.

SNOWDEN MINE.—This a tellurium vein of large size. The company is about to raise ore again, which will add much to the rising monthly gold product of this county.

PETZITE MINE.—Dolores *News*, May 22: The tunnel on the Petzite is now in streaks of rich ore, assaying as high as $1,000 per ton, gold and silver.

ROMERICK DIU.—The vein has been exposed for a width of 10 or 12 ft and no walls as yet, so that the width of the mineral body is still a matter of conjecture.

LEGAL TENDER.—The Legal Tender lode, of Horse creek, is one of the largest gold-bearing quartz leads in the country, having an 181-ft vein.

VALLEY VIEW.—This location, on Telescope mountain, has a 15-ft shaft in 13 inches of ore. The owners are now sinking an incline on the ledge.

IDAHO.

BONANZA CITY.—Challis Cor. *World*, May 25: There was some excitement at Bonanza City when I left—three days ago—over the good clean-ups made from dirt from Mr. Morrison's placer claims, about a mile above town. The gold is very coarse, and last Tuesday 7 ounces of gold, in nuggets, were taken out of dirt from one set of timbers. Wednesday 10 ounces were cleaned up and one nugget weighed a little over 4½ ounces. The claims are very rich, and will be an incentive to the N. Y. Co. to push operations ahead on its extensive ground a few miles below Bonanza.

POVERTY FLAT.—Men just in from Poverty flat report the mines looking splendid. A furnace capable of reducing 25 tons of ore per day is being erected in that section, and there is a move on foot for the erection of another as large. The parties who will put up the latter have no mines, but will purchase ores to work. Most of the machinery for the former is on the ground and the rest coming from Blackfoot.

CHALLIS will be the shipping point and general headquarters for Bonanza, Yellow Jacket, Bay Horse, East Fork, and, in fact, the whole mining country in eastern Idaho.

IDAHO AND VISHNU.—*Statesman*, May 27: In April the Idaho and Vishnu mine struck the ledge with their tunnel and have a fine vein, averaging from 18 inches to 2 ft in width of $100 ore. The ore chimney is over 300 ft in length, and it is estimated that $40,000 are in sight. The 4 lessees have about 50 tons of ore out and are now taking out about 3 tons daily. Even by present working these mines will yield a large amount of bullion this season.

ADA ELMORE.—The sold Ada Elmore mine will be thoroughly reopened and worked extensively this season by Mason & Smith, bankers of N. Y. city. A company called the Ada Elmore G. & S. M. Co. has been formed and the necessary capital raised. To reopen and work this mine properly and successfully will require an outlay of from $30,000 to $50,000.

ALTURAS AND WIOR WEST.—Mr. Johnson and his lessees have out from 40 to 50 tons of ore from the Alturas mine. The Wior West mine have out considerable ore and are daily extracting more.

MONTANA.

ANSELMO MINE.—Butte *Miner*, May 25: Lately this mine has furnished some of the richest specimens of ore produced in this district. The shaft is 85 ft deep, and the vein is continuous from the surface, changing about half way down from a free to a base ore and gradually enlarging to the bottom, where it is not less than 4 ft wide, and yields by assay from $200 to $400 per ton.

CLEAR GRIT.—The work on this claim is confined mainly to driving westward at water level. A crosscut 50 ft west of the working shaft has just been completed, and 16 ft of very hard quartz was found between the walls at this point. It is richest near the footwall. Considering the fact that several hundred tons of medium high-grade ore has been produced with slight development, and that 16 ft of ore width is found in the only crosscut made, the chances for a bonanza are very flattering.

SALISBURY MINE.—An important strike is recorded in this mine. The vertical shaft is 75 ft deep, and from the bottom a level has been run east for a distance of 130 ft. Last week a 15-inch streak was struck in the face of the drift which assayed 1,500 ounces. Within the past few days, however, this streak has widened, and is now fully 7 ft wide. Several hundred tons of ore have been extracted, which is now being worked at the Silver Bow mill.

WAKE UP JIM.—This mine continues to improve with development. The east level is in about 40 ft, and considerable free ore is being stoped, assaying from 40 to 60 ounces. The Wake Up Jim is one of the widest ledges in the camp.

GRAY ROCK.—Recently at a distance of 17 ft from the main level a 3-ft ledge of excellent looking ore was uncovered, assaying 69 ounces in silver in the top and 71 ounces in the bottom, the water level seeming to run midway from the ceiling to the floor, dividing the free milling from the base.

STEVENS.—The drift running northeast from the bottom of the 40-ft shaft has been extended to a length of 60 ft, following a 2-ft vein of 50-ounce ore, of which about 00 tons are on the dump. Other shafts on the claim are being prospected with excellent results, a considerable amount of 100-ounce ore being taken out.

NEW MEXICO.

GEORGETOWN DISTRICT.—Cor. *Grant County Herald*, May 17: Our mines are all looking well, and are turning out ore in considerable quantities. McGregor Bros. are about completing a whim to be run by horse power, on a new shaft which will be sunk about 100 ft. Their mine, the McGregor, is yielding the usual quantity of good ore. On the Commercial mine Messrs. Kelley & Irwin have a lease and are taking out a large amount of very high grade ore. Bragaw and Perry are still taking out good ore, and a good deal of it, from the McNulty. Have just learned that the Mimbres M. Co. have purchased in Cal. a 10-stamp mill (800-lb stamps) with 8 amalgamating pans and everything complete, with engines for mill and hoisting works. So you see that we will soon not be lacking in milling capacity to work our ores as heretofore. Their mine, the Naiad Queen, is yielding ore in large quantity, and of high grade.

SAN SIMON MINES.—Cor. *Grant County Herald*, May 22: We are now convinced that San Simon will yet be second to no district in New Mexico. The work is being pushed forward with night and day shifts on a large number of claims, which are showing up better and better as the work goes on. The Sterling Price is down about 50 ft, has a 3-ft vein and is looking splendid, runs about 100 ounces silver, owned by Mr. Henry of the New York *Herald*. The Fractional is also looking away up, as are also the Carbonate and Bismarck. The latter had a mill run of over 200 ounces silver. The Little Emma has a 20-ft shaft and is being worked night and day; the showing is more than satisfactory; will sink 75 ft. In fact all the property being worked gives a good showing. The Sterling Prince is on the same vein as the well-known Fry Duncan and Rip Van Winkle mines, and needs no better guarantee of its success as a mine.

OREGON.

MAMMOTH MINE.—*Bedrock Democrat*, May 13: We learn from Mr. John Toy, who came down from this mine last week, that the owners, Messrs. Ramsdale & Baisley, have made a crushing of 75 tons of average ore, which yielded $45 per ton. The proprietors of this mine have been at considerable expense in developing and erecting machinery, and naturally feel elated over the good clean-up they have made. They have erected a 5-stamp steam mill and have a 20-horse power engine, and can add another battery whenever they feel so disposed. The ledge is 16 ft wide, 5 ft of which is good milling ore.

RICH STRIKE.—We learn from Mr. Geo. Borman that himself, Jas. Colcly, Jas. Murry, Geo. Cooper and Ed. Borman have struck a splendid gold-bearing quartz ledge. Mr. B. came to this city to have the ledge recorded. This ledge is situated about 4 miles southeast of the Virtue mine, and the ore is of the same character as the Virtue mine ore. The owners have commenced sinking on the ledge.

NEW DISCOVERY.—Baker City *Democrat*, May 26: There has been a very rich strike made about two miles east of the Virtue mine this week. We have seen some of the rock taken from there, and we can say that it is the best looking quartz we have seen in Baker county. There has been plenty of specimen quartz taken out of a number of mines in the surrounding country that excels this quartz in richness, but for average ore, this equals any ledge in the county; the discoverers have commenced sinking on the ledge and are taking out rock for crushing, they have at the present depth, 3 ft in width of solid quartz. The fineness of the gold, as near as we can judge, is about $17 per ounce.

Texas Millet.

We give on thie page an engraving of Texae millet, a forage plant whicb has gained some prominence in the Southern Statee, and is put forth as worthy of attention by the Commisioner of Agriculture in hie report for 1878. It is repreeented to be a graes of vigorous, rapid growth. It is very leafy, tbe leavee broad, rather tbin, eprinkled with eoft bairs. It growe two to three feet high, but tbe epreading etalke are often four feet or more in length, growing very cloee and tbick at the base, and yielding a large amount of food.

Thie grass hae been brougbt to tbe attention of tbe department during eeveral yeare paet. Mr. Pryor Lea, of Goliad, Texae, has had it in cultivation for a number of years, and writes respecting it as follows: "I coneider it far euperior to any grase that I ever eaw for bay. It is a much more certain crop than millet, and cultivated with leee labor, and all kinde of etock prefer it. I expect to report a good eecond crop on the eame ground thie year. In thie region tbis graes, in the condition of well-cultured hay, ie regarded as more nutritious than any other grass. It growe only in cultivated land; it prospers best in the warmeet fourtb of the year; its luxurioue growth eubduee other graseee and eome weeds, witb the reeult of leaving tbe ground in an ameliorated condition."

The following is the tecbnical deecription of tbe plant: Branchee of the panicle rough, the pedicele with ecattered haire, eepecially near the flowere; spikelets oblong, eomewbat pointed, 2 to 2½ lines long, sparsely bairy; lower glume balf or two-thirde tbe length of the upper, acute, 5-nerved, the lateral nerves uniting with the midnerve below the apex; upper glume prominently 5 to 7 nerved, pointed; eterile flower with 2 palets, the lower 5 to 7 nerved, much like the upper glume, the upper palet thin and transparent, as long as the lower; perfect flower ovate or oblong-ovate, acutieb, tranevereely wrinkled with fine reticulated striæ.

An annual graee two to four feet bigh, eparingly branched, at firet erect, becoming decumbent and widely epreading, very leafy, ebeathe and leaves finely eoft—bairy; margin of the leaves rough; leaf bladee 6 to 8 incbes long and ¼ to 1 inch wide, upper leaves reaching to the base of tbe panicle, or nearly so; panicle 6 to 8 inchee long, etrict, tbe branchee alternate, erect, eimple, 3 to 4 inchee long, with somewbat ecattered eessile spikelete.

THE BODIE MINES.—For eeveral months all tbe Bodie etocks have ruled low in the Board. Thie has not been caused through their want of merit, but rather througb the witbdrawal of large amounts of capital from the State and the fears entertained by capital remaining in the State as to tbe action of tbe Legislature upon their interests. Thie eource of trouble baving paesed away, the borizon ie now clear, and capital will again come from its hiding-place and revivify the veine of trade with ite golden etream. The days of stock-jobe and boome have paesed away, and in the future we may only look for them to the extent aud value of ore bodiee uncovered and expoeed to view. We are glad euch ie the caee, ae it ie tbe only basis upon which mining can ever be made permanently eucceseful. Thie bringe it within the purview of all husineee conducted upon eound principlee, and takee from it the gambling feature—a bane to any enterprise. So far as Bodie minee are concerned, under tbie new order of the mining trade, tbe real merit of our undeveloped mines will place them in the front rank of legitimate mining enterprisee. It is true our mines remain almoet in their virgin purity, yet the favorable proepects of the propertiee of Queen Bee Hill, Silver Hill, Bodie Bluff and High Peak, in the mines sinking to great deptbs, and from geological indications known to be cloee to tbeir ledgee, whilet othere have already cut them and are now opening them up and developing their riches, it ie no experiment with ue, but an aseured fact that our mines, placed in the market at their proper value at the preeent ehowing, will advance a hundred per cent. within tbe next eix months, purely on their merit, and many of them will advance a thousand.—*News.*

THE WILLOW CREEK MINES.—Another ledge of fabuloue richneee is reported to have been found a few daye ago a ehort dietance from the etage station at Willow Creek on the Idaho road. We have heen unable, eo far, to learn any particulars relating to tbe new find, except that the ore is fabulouely rioh in eilver. The lucky diecoverere eimply eatiefied themeelvee that they had found a ledge, that it contained rich ore, and then located it, after wbich they repaired to tbe etation and celebrated the event in the old-fashioned way hy getting on a epree. The preeent prospects denote that Willow Creek will eoon be a prosperoue mining camp. The Obio mine, the first diecovered in the district, ie said to be one of the heet in the whole upper conntry. It ie eomewhat remarkable that thougb tbe creek hae yielded coneiderable free gold, and a number of Chinese have been engaged in placer mining there for the paet year or two, that no gold-bearing ledges have yet been diecovered in the vicinity. Somebody will find a lead there eome of these daye that will throw Bodie in the ehade, as the free gold which ahounds in the gravel must have come from a quartz vein eomewhere in the adjoining ranges.—*Silver State.*

The Copper Boom.

D. H. Jackeon, Supt. of the North Bonanza and Flowery mines, has purchased the copper mine in Mason valley owned by J. Daniels. The copper mine ie eituated in Mason valley, about two milee from Walker river, and bas been opened by a ehaft 100 ft. in depth. A drift ie heing run on the ore body and the shaft ie being eunk to a greater depth as fast as muecle and power can do it. Abont 120 tone of the surface rock has been reduced at the Dayton reduction worke, yielding from $21.50 to $36 per ton of copper and from $5 to $20 per ton of gold and eilver, and as deptb hae been attained in the shaft the grade of ore hae constantly increaeed in value. They are now, while driving the drift and einking the shaft, taking out from tbree to four tons of aecorted rock per day, eetting it aside for reduction. Tbe drift will be run on the ledge to tbe line of the claim, when crosscutting and etoping ore will be commenced. The sbaft will be continued and etatione opened out at each 100 level. The width of the vein ie not known, but at the eurface it ehows from 40 to 50 ft. in width. The company will immediately commence the conetruction of reduction works on the Walker river, about two miles from the mine, and when completed thie mine and worke will undoubtedly prove a veritable bonanza. It is a mountain of copper ore, and in places ehows large quantitiee of native copper. The former owner, a ranchman, mined the ore, and, hauling it to Dayton, sold it to the hluestone manufactory at that place. There is not a timber in the mine. In extracting the ore Mr. D. left great pillare of ore—10 to 15 ft. in diameter—ae eupporte. Mr. J. will emelt the copper, running it into ingots for traneportation. An abundance of charcoal can be obtained in the immediate neighborhood of the mine. There is also plenty of water in the vicinity.—*Esmeralda Herald.*

TEXAS MILLET.—Panicum Texanum.

A TON of ore from the San Jacinto minee, in San Diego county, hae been shipped to New York to test its value. If the working teet proves satiefactory, the eale will be completed, and anumber of men employed extracting ore.

GIGANTIC MINING ENTERPRISE.—An aesociation known as tbe "Eocene Tunnel and Mining Co.," bae filed ite claim to all tbat part of the North Fork of Feather river, from bank to bank, for a distance of 11 milee, deeignated on the map and commonly known ae the "Big Bend of the North Fork of Feather river." It also claime the rigbt of way for tunnele, flumee, ditchee or pipes neceeeary to eucceesfully work the same. The objects of tbe company are eet forth to be tbe diverting of the water from ite natural channel and the mining or digging of the river bed, and all bare located in it, within the confines above deecribed, for precious metale. It ie aleo etated tbat the company does not propoee or intend to interfere with veeted or accrued rights already acquired by other partiee. That the company is a powerful moneyed inetitution ie fully demonstrated by the following namee of the membere: Wm. H. Vanderbilt, Anthony J. Drexel, Chae. H. Lewie, Joe. H. Banker, Thoe. A. Edieon, R. L. Cutting, Jr. Geo. C. Perkine, Chas Batchelor, Wm. H. Cox, F. McLaugblin, E. W. McKinstry, J. C. Logan, John Hoey, G. W. Cumminge, P. O. Hundley. This ie beyond question the greateet mining enterprise ever undertaken on thie continent, and it poseesses a capital unequaled by any financial institution in tbe world except, possibly, the Rothechilde. Operatione will be entered upon before tbe cloee of the present season. The fabnlous wealtb of Feather river bed mineral deposits ie eo well known, and hae been eo etrikingly demonstrated by the few developmente hitherto enacted on a emall ecale, that the feasibility of this nndertaking and the profitable character of the inveetment are queetione admitting of no diecussion.

RICH TAILINOS.—We learn from the Reno *Gazette* that the old tailings of the Ophir, at Franktown, are now yielding $300 ner day, of which $175 is clear profit, and the amount will average that eum for the next two yeare, the time required to work up all of tbe tailings.

SEVERAL of the ownere of quartz mines in the vicinity of Fort Jones, Siekiyon county, will huild emall mille this epring, as they find hauling to cuetom mille, and paying the going rates for crusbing, to be an eneroue tax.

Recent Decisions Relating to Patents, etc.

We give below brief abstracts of decisions* rendered upon patent cases in litigation, for tbe benefit of our readers:

DECISIONS OF THE U. S. COURTS.

Parks et al. vs. Booth.

Supreme Court of the U. S.—Decided October term, 1879. Appeal from the Circuit Court of the U. S. from the Northern District of Ohio. Mr. Justice Clifford delivered the opinion of the court:

1. It is essential to the validity of a patent that the particular invention he pointed out and distinguished from what is old, and when the inveution consists merely of a new combination of old elements or devices, when nothing is or can be claimed except the new combination, it is sufficiently described to constitute a compliance with the letter and spirit of the law if the devices of which it is composed are specifically named, their mode of operation given and the new and useful result to be accomplished is pointed out, so that those skilled in the art and the public may know the extent and nature of the claim and what the parts are which co-operate to do the work.

2. It is not necessary to allege or prove, in order to sustain the defense of prior patent or printed publication, that such patent or publication was issued or given two years earlier than the patentee's invention.

3. When the patent covers an entirety it cannot he defeated by showing that the several component parts are old in other connections. It must appear that they have existed together in the same relation.

4. More than one patent may he included in one suit, and more than one invention may he secured in the same patent, in which cases the several defenses of prior invention and public use may be made to each patent in the suit and to each invention to which the charge of infringement relates.

5. The patent act allows the infringer to plead and prove that the invention of the patentee had been in public use or on sale in this country for more than two years before the inventor applied for a pateut; but no question of priority is open under that defense, nor will evidence sustain it that another had made or patented the invention two years before the application without the knowledge of the patentee whose invention is in question.

6. It not appearing that the complainant was guilty of laches in applying for a patent, or that *his improvement* ever went into public use or was on sale in this country before he applied for a pateut, the patent was held to be valid.

7. Interests in the profits decreed to the complainant should not be allowed. The profits in such case are to he regarded in the light of unliquidated damages, which usually do not draw interest without the special order of the court.

* More complete reports of the proceedings may he found on file in the office of the MINING AND SCIENTIFIC PRESS Patent Agency, 202 Sansome street, S. F.

QUIXOTIC DREAMS OF MINING.—Among the numerous mining schemes by which money was "epent in the Florida war," in the way of mining schemee in Oroville, wae the propoeition to eink a ehaft on the bank of the Feather river, tunnel from the shaft under the river, and then work up through the bedrock and eecure the gold in the hed of the stream. The ehaft was eunk on the bank of the river, but it filled up with water eo fast that no tunnel could he run under the river. Another scheme of great expectations was that of the "eucker boate," which were to navigate the river and run their elephant-like suckere over the bottom and draw up the gold. The wrecke of theee boate line the river for eome dietance below Oroville, eome of them dismantled, with their machinery taken out or abandoned. Now comee another propoeition, and "by Jingo, the man and the money" is on hand to try it, and that ie to hore a hole down any distance to the depth of 200 feet, and eet a machine to running with buckets, eomething like an elevator for grain, to gather tbe dirt and the gold duet as it comes up, and dump it on top of the earth ready to he waehed. Thie machine, when in full hlast, will, it ie eaid, work a square of about 200 cubic feet per day, and of course promiees great results.—*Chico Record.*

A BIG TUNNEL PROJECT.—We have heard some talk thie week about a big tunnel enterpriee tbat is heing worked up and put in ehape by partiee who requeet that their names he kept out of print until their preliminary arrangemente are fully completed, when we will he at liberty to publieh all the particnlare. We can eay, bowever, without committing a hrcach of confidence, that the projected tunnel will probahly start at a point eomewhere near the eite of the old Antelope mill, and run under Silver Hill, a distance of about a mile and a half, tapping the great backbone of the ridge at a depth which has not yet been accurately determined, hut deep enough at any rate to eettle all queetione concerning the permanency of our minee. Lateral drifte will be run to intereect blind crose-veine which, with coneiderable reason, are euppoeed to exiet on eitber eide of the line of the tunnel. That which will he extended eaet into Last Chance Hill will drain the Real del Monte ground eeven or eight hundred feet below present workinge, and enable tbe company to diepenee with the uee of a boat in going about the lower levele. The tunnel will be a big thing for the town, but we hope Sutro won't he mixed up in it, for he ie death on grase widowe.—*Esmeralda Herald.*

A SURGICAL instrument for the extraction of the poieon from wounds inflicted by venomous or rabid animale is mentioned in the Englieh medical journale. Suction with the lipe hae sometimes been reeorted to in euch caeee, but ie undoubtedly dangeroue to the persou who attempts it. This has been clearly ascertained in regard to the bite of the cobra.

A STATEMENT iseued hy tbe Bureau of Statietice ebowe that the total value of the exports of petroleum and petroleum products of the United Statee dnring the month of March, 1880, was $2,378,342, and during March, 1879, $2,059,826; for the nine monthe ended March 31, 1880, $30,615,256, and for the same period in 1879, $31,448,961.

The Engineer.

Coal Dust Explosions.

At the meetiag of the Royal Society, af England, March 13th, a paper was read "Oa the Influence of Coal Dust in Colliery Explosione," by W. Gallaway; commnnicated by Robert H. Scott, F. R. S. The paper described various experiments in proof of Mr. Galloway's now well-known theory of colliery explosious, tho first being made with a very simple apparatus consisting of a coutiuuous pipe about 18 in. in diameter, wbich conducts a small portion of the return air from the point at which it is injected into the atmosphere by tho ventilating fan to a convenient spot au the level of the surface, where it eecapes as a strong current, amounting to 1,251 cubic ft. per minute. About 6 ft. from ite point of exit a lamp can be placed ia the center of the current, aad at a distance of about one ft. still ncarer the origin there is a means of allowing coal dust to fall into aad mix with the passing air. It ie found that when the coal dust ie added, the air becomes instantly inflammable, sbowing that all the return air ia the workings may be easily brought into the samo condition by a sadden disturbance, euch as that caused by a local explosion of fire-damp. Tho second experiment was intended to illustrate the effects of an explosion of fire-damp in a dry mine containing coal duet. The only means of avoiding the dangers due to the presence of coal dust in mines appears to be to carefully and conetantly water tho roadways leading to and from the working places. "It is very interesting to be able"—says *Nature*—"to mention a fact in connection with watering the roadways, which, althongh not mentioned in Mr. Galloway's paper, is well worthy of a place here, viz., that the Abercarne explosion ramified through every part of the workings, which were exceedingly dry and dusty, with the exception of one dietrict from which it was entircly cut off by 200 yards of a very wet roadway, and that the men in the latter district not only escaped unhnrt, but hardly felt the explosion. The wetness of this roadway was due to natural causes."

The East River Bridge.—The N. Y. approach to the East river brdge is finished with the exception of about four blocks, and the property through to Chatham street has been appraised by the bridge authorities. Should this not be accepted by the owners, a commisaion, acting under the railroad law, will be appointed to value the land. Upon this portion of the work 90,000 bricks are being laid daily. But one block of the Brooklyn approach remains unfinished. The cities still hold about $1,000,000 of an interest accruing from the sale of bonds. The first 100 tons of the recently awarded contract for steel have been sent from the Cambria Iron Company at Midvale to be rolled; from there they will be taken to the Edgemoor Iron Company, who do the drilling, fitting, etc. The bill for the final appropriation —$2,250,000—now pending in the Legislature, has passed the Senate with an amendment, and is in the Honse, where it is favorably received. —*Engineering News.*

A Truly Elevated Railroad.—The traveler, the tourist, can now visit the crater of Vesuvins without inconvenience, a railroad having been constructed that takes one to the very aperture of the volcano. The terminal station of the road is situated at an altitude of 810 meters, or 210 meters above the observatory. In connection with the station is a restaurant and *cafe*, with capacity to accomodate 100 persons. The angle of inclination of the road is at places 40°, 50° and even 63°. There are two coaches for the transportation of passengers—the Vesuvius and the Etna—each one of which can take 12 persone. The system adopted in the construction of this railroad is of American invention, and is called the "prismatic system."—*La Raza Latina.*

Bridge Engineering.—The designs of the Forth bridge—a much more dangerous undertaking than the Tay bridge—are to be reconsidered, and that it is very doubtful if the gigantic echeme, as at present conceived by Sir Thomae Bouch, will he carried out. It is to be regretted that more pains were not taken to elicit from a large number of engineers designs for the crossing of the Forth estuary, for not until more eubstantial etructures are proved to be impossible ehould a suspension bridge for railroad traffic be permitted. To hang up from towers cousiderably higher than St. Paul's cathedral two huge epans of 1,600 ft may he a very grand scheme, but hardly one to be risked without urgent need.

The Upper Mississippi.—Gen. Wright, Chief of Engineers, has made a further report on the improvement of the Upper Mississippi. It appears that the reservoir will hold 56,000,000,000 cubic feet of water, available after July 1st. It ie estimated that at St. Paul the volume of the river would be doubled. The total cost would be $400,000; operating expenses, $7,840 per annum.

Large Shipments of Coal.—The shipment of coal from Seattle, W. T., for the month of April, exceeded any previous month since the opening of the mines. Eleven vessels cleared with an aggregate of 16,275 tons, and with two vessels half loaded at the chutes, makes the total amount delivered on board vessels nearly 18,000 tons.

Useful Information.

Facts Useful and Curious.

Tho greyhound runs by eyesight only, and this we observe as a fact. Tho carrier pigeon flies his 250 miles homeward by eyesight—namely, from point to point of abjects which he has marked; but this is only our conjecture. Tbe fierce dragon-fly, with 12,000 lenses in his eye, darts from angle to angle witb the rapidity of a flashiag sword, aad as rapidly darts back, not turning in the air, but with a clash reverciag the action of his four wings, aad instantaneously calculating the distaace of the objects, or he would dash himself to pieces. But in what conformatioa of the eye does this coasist? No oae can answer.

A cloud of 10,000 gnats dance up aad down in the sun, the minutest iuterval between them, yet no ono knocks another headlong upoa the grase, or breaks a leg or wing, long and delicate as these are. Suddenly, amidst your admiratioa of this matchless dance, a peculiarly high shouldered, vicious gnat, with loag, pendaat nose, darts out of the rising and falling cloud, aad, settling on your cheek, ineerts a poisonous sting. What possessed the little wretch to do tbis? Did he smell your blood in the mazy dance? No one knows.

A carriage comes suddenly upon a flock of geese, on a narrow road, and drives straight through the middle of them. A goose was never yet fairly rnn over, nor a duck. They are under tho very wheel and hoofs, and yet somehow they contrive to flap and waddle safely off. Habitually stupid, heavy and indolent, they are nevertheless equal to any emergency.

Why does the lonely woodpecker, when he descends his tree and goes to drink, stop several times on his way, listen and look round, before he takee his draught? No one knows. How is it that the species of ant, which is taken in battle by other ants to be made slavee, should be the black, or negro ant? No one knows.

The power of judging of actual danger, and the free and easy boldness which reeults from it, are by no means uncommon. Many birds seem to have a most correct notion of a gun's range, and while scrupulously careful to keep beyond it, confine their care to this caution, though the most obvious resource would be to fly right away out of sight and hearing, which they do not choose to do. And they sometimes appear to make even an ostentations use of their power, fairly putting their wit and cleverness in antagonism to that of man, for the benefit of their fellows. We lately read an account, by a naturalist in Brazil, of an expedition he made to one of the islands of the Amazon to shoot spoon-bills, ibises and other of the magnificent grallatorial birds, whicb were most abundant there. His design was completely baffled, however, by a wretched little sandpiper that preceded him, continually uttering his tell-tale cry, which at once aroused all the birde within hearing. Throughont the day did this individual bird continue his self-imposed duty of sentinel to others, effectnally preventing the approach of the fowler to the game, and yet managing to keep out of the range of his gun.

Cements for the Shop.

Iron Cement for Closing the Joints of Iron Pipes.—Take of coarsely powdered iron borings, five pounds; powdered sal-ammoniac, two ounces; sulphur, one ounce; and water sufficient to moieten it. This composition hardens rapidly; but if time can be allowed it sets more firmly without the eulphur. It muet be used as soon as mixed and rammed tightly into the joint.

2. Take sal-ammoniac, two ounces; sublimed sulphur, one ounce; cast iron filings or fine turnings, one pound. Mix in a mortar and keep the powder dry. When it is to he used, mix it with twenty times its weight of clean iron turnings or filings, and grind the whole in a mortar; then wet it with water until it becomes of convenient consistence, when it is to be applied to the joint. After a time it becomes as hard and strong as any part of the metal.

Cement for Uniting Leather and Metal.—Wash the metal with hot gelatine; eteep the leather in an infusion of nutgalls (hot) and bring the two together.

Cement for Leather Belting.—One who has tried everything says that after an experience of 15 yeare he has found nothing to equal the following: Common glue and isinglass, equal parts, soaked for ten hours in just enough water to cover them. Bring gradually to a boiling heat and add pure tannin until the whole becomes ropy or appears like the white of an egg. Buff off the surfaces to be joined. apply this cement warm, and clamp firmly.

Steam-Boiler Cement.—Mix two parts of finely powdered litharge with one part of very fine sand, and one part of quicklime which has been allowed to elake spontaneously by exposure to the air. This mixture may be kept for any length of time without injuring. In using it a portion ie mixed into paste with linseed oil, or, still better, boiled lineeed oil. In this state it must be quickly applied, as it soon becomes hard.

Turner Cement.—Melt one pound of resin in a pan over the fire, and when melted, add one-quarter of a pound of pitch: While these are boiling add brick-dust until by dropping a little an a cold stone, you thiak it hard enough. In winter it may be necesaary to add a little tallow. By means of this cement a piece af wood may be fasteued to the chuck, which will hold when cool; and when the work is fiuished it may be removed by a smart stroke with the tool. Any tracee of the cemeat may be removed from the work by means of benzine.

Wollaston's White Cement for Large Objects. —Beeswax ane onace; resin, four ounces; powdered plaster-of-parie, five ounces. Melt together. To use, warm the edges of the specimen and nee the cement warm.

Gutta-Percha Cement.—This highly recommeaded cement ie made by melting together in an iron pan, two parts commoa pitch and oae part gutta-percha, stirring them well together until thoroughly incorporated, and then pouring the liquid iuto cold water. When cold it is black, solid and elastic; but it softens with heat, and at 100° Fah. is a thin fluid. It may be used as a soft paste, or in the liquid state, and answers an excellent purpose in cemeatiag metal, glass, porcelain, ivory, etc. It may be used instead of putty for glazing windows.

Luminous Flowers.—Amoag the elcgant novelties of the hour now offered for sale on the Paris boulevards are phosphorescent flowers, which glow with a lambont light in the dark, and rival their natural tints. They are rendered luminous by coating the petals with transparent size, and then dusting them with a phosphorescent subetance, such as canton phosphorus (sulphide of calcium) or Bologna phosphorus (sulphide of barium). Canton phosphorus is the best, and yields a soft yellow light. According to M. Becquerel, a good quality can he made by mixing 48 parts of flowers of snlphur with 53 parts of calcined oyster shells, and raising them to a temperature of between 800 and 900 degrees centigrade in a crucible. After exposure to sunlight during the day, or to the electric or magnesium light, the flowers thus coated becomo brightly luminous in the dark.

The Secretary of the American Iron and Steol Association reports 697 blast furnaces in the United States, with an annual capacity of 6,500,000 tone of pig iron; 382 rolling mills, with an annual capacity of 4,000,000 tons, the capacity of the rail mills being 2,150,000 tons; 11 Bessemer steel works, with an annual capacity of 1,750,000 tons, besides 11,880 miscellaneous works.

Good Health.

Constipation.

It is doubtful if consnmption numbers as many victims as are stricken down by the various diseases that result from habitual constipation. True consumption is an inherited disease. It may remain always dormant, but when aroused to action, decay commences at a point circumscribed, and gradually extends—unless arrested—until so much of the lungs become involved that vital action ceases. The evils of constipation result from inattention to the calls of nature, and usually commence with children whose habits are not closely looked to by their parents. The processes of nature are always active while life lasts. When effete matter is retained a moment beyond the time its expulsion is demanded, the system commences its efforts to get rid of it. When the natural egrese is checked, the absorbents carry the more fluid portions of the poisonous mass into the circulation, and it becomes diffused throughout the body. The more solid or clay-like portion is forced into the lower rectum where it becomes firmly impacted, thns cutting off the circulation in the small blood vessels, causing painful engorgement known as piles and hemorrhoids. A continuence of these troublee often results in fissure, fistula or cancer. The trouble is seldom confined here. As a result of the blood poisoning we almost invariably find more or less dyspepsia, with decided derangement of the functions of the heart, liver and kidneys, accompanied by headache and nervous debility, often verging on paralysis.

Persons of sedentary habits are most subject to constipation and its sequences. Before the plan of treatment devised by M. Nelaton was introduced, habitual constipation was a disease of far more serious import than at the present time. All physicians admit that cathartics afford only temporary relief, and catharsis cannot be induced except by stimulating the bowels with irritants, and as this irritative process gradually weakens their peristaltio action, the relief from them steadily diminishes until disease of some vital organ sets in, and terminates life. Relief from injections is just as pernicious, with the added danger of strictures of the rectum. With these facts in view, M. Nelaton commenced his inveetigations, which resulted in proving beyond question that all uncomplicated cases of constipation, the obstruction exiete solely in the lower portion of the rectum, and within reach of local remedies. For the radical cure of the various diseased conditions, he invented "Nelaton's Suppositories." It is said they succeeded beyond his own expectations. But in old and severe cases their use must be persisted in until the cure ie complete.—*Hall's Journal of Health.*

Cautions in Eating.

1. Of course don't eat too much. The digestive fluide are limited in quantity. All above enongh is undigested, irritating and weakening the system, and often causing paralysis of the brain by drawing on the nervous force more rapidly thau it is generated.

2. Don't oat botwecn meals. The stomach must rest, or it will sooner or later break down. Even the heart has to rest between the beats.

3. Dou't eat a full meal when exhausted The etomach is as exhausted as the rest of tbe body.

4. Dou't take lunch at noon and eat heartily at night. The whole digestive system needs to share in the reet and recuperation of eleep. Besides, the tendeacy is to put a full meal into a wcakened stomach.

5. Don't substitute etimnlns for food—like many women who do half a day'e work oa strong tea or coffcc. As woll, in the case of a horse, substitute the whip for oats.

6. Don't have a daily monotony of dishes. Variety is necessary for relish, aad relish is necessary to good digestion.

7. Don't eat blindly. There can be nothing in the body—muscles, membranes, bones, nerve, brain—whicn is not in our food. Oae article furnishes ono or more elements, and another, others. We could starve on fine flour. Some articlcs do not nourish, only warm.

8. Eat according to the season—one-third less in summer than in winter. In the latter fat meat, sugar and starch are appropriate, as boing heat-makers; in the former, milk, vegetables aud every kind of ripe fruit.

9. Eat with cheer. Cheer promotes digestion; care, fret and passion arrest it. Lively chat, racy anecdotes and innocent gossip are better than Halford sauce.

Artificial Respiration.—The *Medical Press and Circular*, 1880, informs us that in a recent communication to the French Academy, Prof. Fort raises again the question of premature interments. One fact he mentione is, that he was enabled to restore to life a child three years old, by practicing artificial respiration on it four hours, commencing three hours and a half after apparent death. Another case was communicated to him by Dr. Fournol, of Billancourt, who, in July, 1878, reanimated a nearly drowned person after four houre of artificial respiration. This person had been in the water 10 minutes, and the doctor arrived one hour after asphyxia. Prof. Fort ineists also on the utility of artificial respiration in cases of poisoning, in order to eliminate the poisons from the lungs and glands. The length of time it is desirable to practice artificial respiration in any case of apparent death from asphyxia, Prof. Fort has not yet determined, but his general conclusion is that it should be maintained perseveringly for several hours.

Starving out Cancers.—At a late meeting of the Leeds (England) Medical and Chirurgical Society, J. W. Teale read a case of quiescent scirrhus. The patient was an unmarried lady of 35. A cancer formed in her breast, causing retraction and ultimately loss of the nipple; it ulcerated; some axillary glands enlarged, and the patient seemed about to die. But in consequence, as it seemed, of the small quantity of food taken by the patient, the cancer was "starved." It atrophied slowly; and now, nine years after its first appearance, there was nothing but a hard cicatrix left in the breast and axilla. Cases more or less similar were related in the discussion which followed.—*Medical and Surgical Reporter.*

Healthy Property of Onions.—The healthy property of onions has never been fully understood. Lung and liver complaints are certainly benefited, often cured by a free consumption of them, either cooked or raw. Colds yield to them like magic. Don't be afraid of them. Taken at night, all offense will he gone by morning, and the good effects will amply compensate for the trifling annoyance. Taken regularly they promote the health of the lungs and digestive organs. An extract made by boiling down the jnice of onione to a syrup, and taken as a medicine, answere the purpose very well, but fried, roasted or boiled onions are better. Onions are a very cheap medicine, within everybody's reach, and they are not by any means ae "had to take" as the costly nostrums a neglect of their use may necessitate.

Treatment of Simple Hiccough.—Dr. Grellety once saw a mother, tender and full of affection for her children, give them a morsel of sugar dipped in table vinegar whenever immoderate or too rapid repletion of the stomach or auy other cause had inducod hiccough. The The latter ceased as if by magic. Since then the Vichy physician has very frequently employed this means on his own account, and has never fonnd it without avail.—*The Pharmacist and Chemist.*

To Remove Gunpowder Marks.—Smear the scorched places with glycerine, by means of a feather, thenapply cotton wadding; lastly cover with oil silk. In one case the discoloration was very great, the patient looking more like a mummy than a living being. It entirely subsided in a month by the above treatment.—*London Lancet.*

A Pleasant Mouth Disinfectant.—Hypermangate of potassa and hyperoxydate of barium of each 24 grains, to be ruhbed up into a mass with sugar and glycerine, and divided into 144 lozenges. Every ill-emelling mouth will become by their use perfectly odorless.—*Medical Record.*

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Business Announcements.

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Boarding School for Boys—D. P. Sackett, Oakland, Cal.
Improved Grounds for Sale—C. Fieldsted, San Jose, Cal.
Removal—Belcher, Manhattan, Champion and New York Mining Companies.
Dividend Notice—Standard Con M. Co.
Removal—Ophir S. M. Co. and Mexican G. & S. M. Co.
Dividend Notice—Spaulding G. & S. M. Co.
Annual Meeting—Spring Valley Water Works.

The Week.

Since our last issue pleasant summer weather has prevailed throughout the State, and the reports from farm, garden, and vineyard, are generally cheering. The norther, which prevailed in the interior for several days, did not fortunately cause much damage to the crops; there was a shrinkage of wheat in some localities, and slight injury to gardens; but on the whole, the blustering north wind brought good rather than evil. In the higher counties the snow is melting rapidly, and active work in mining districts resumed.

Our multifarious mining exchanges teem with accounts of discoveries and booms and active, hopeful work. This feature is especially noticeable in the mining camps of this State, where something of the old-time activity prevails. It would appear that the gold quartz mines are receiving unwonted attention, and the outlook for a prosperous and productive year is excellent.

An interesting inquiry has been placed on foot in the House of Representatives in regard to the effect of the debris from the mines upon our harbor, which will result, it is hoped, in bringing out trustworthy data and practical suggestions and, what is better still, appropriations for relief.

Decoration Day, made a legal holiday by the last Legislature, was celebrated in this city in a fine spirit. In the large procession were detachments from the national army and navy, and the military display was superb. The streets were lined with sympathetic people.

THE simplest court seal yet adopted is that of the Superior Court of Ventura county, an impress of which was filed with the Secretary of State lately. It consists of a simple pair of scales and the words, *Fiat justitia.*

Improvement in the Lixiviation of Ores.

Heretofore the leaching of ores has been practiced in one or two ways. The first, known as "filtration," is a method in which, in order to allow the liquor to permeate the ore freely after roasting, very coarse crushing was necessary, which rendered high chlorinations impossible. The second is known as "agitation;" to crush the ore to the finest division, roast it and then treat it in tubs with the leaching liquor, and agitate it until the chloride of silver was dissolved. The whole mass was then allowed to settle, and the liquor on the surface was drawn off. The remaining liquor—60 or 70 gallons per ton—with which the ore is saturated, and the silver contained therein, is usually lost.

Neither of these processes has been very successfully operated in a practical way, for the following reasons: In the first-named process the coarse crushing of the ore prevented such a furnace chlorination, owing to the size of the particles, as to render impossible the chlorination of a high percentage of the silver in the ore, and the silver thus lost kept the process from being profitably worked. In process second, though the ore was crushed sufficiently fine to obtain a good chlorination, the loss of silver due to the loss of silver-containing liquor with which the ore is saturated, after the surface liquor is drawn off, prevented a profitable working.

Mr. David W. Brunton, lately of Silver Peak, Nev., and at present, we believe, at Georgetown, Col., has recently patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a method of lixiviation, which consists in a series of steps, carried out in conjunction with proper apparatus, whereby he leaches the precious metals from finely divided ores roasted at a low temperature, so that the base-metal chlorides formed in the roasting remain in the body of the ore. The invention further consists in a leaching process, wherein the solvent liquor is made by the solution of base-metal chlorides formed in the roasting of the ore being treated.

A supply tub to hold the base-metal chloride leaching liquor, is placed on a frame above another tub, so that the required supply of base-metal chloride solution is run from the upper to the lower tub. A revolving stirrer in the lower tub is then set in motion, and as it revolves the hot roasted ore from the furnace is fed into the leaching liquor until the required amount is immersed. The revolution of the stirrer is continued until the chloride of silver in the roasted ore is dissolved, which takes from four to six hours. Then the charge of ore and leaching liquor now charged with argentic chloride, is drawn off into a filter tub which is provided with a false perforated bottom. In this filter tub the charge is allowed to settle until the particles of ore sink to the false bottom. Then the greater portion of the argeutiferous liquor will be at the top and it is drawn off by a siphon.

In drawing the silver-containing liquor from the filter tub, after the siphon has exhausted all that is upon the surface, there still remains an amount due to the salivation of the finely divided ore, and this is removed by flushing the top of the mass of ore with pure water, and as the liquor is of greater specific gravity than the water, it is forced toward the bottom of the tub or displaced by the water.

In roasting the ores at a low temperature the inventor loses neither any of the silver nor base-metal chlorides formed during the roasting of the ore. These base-metal chlorides formed in the roasting of the ore, are soluble, and when water is added to the ore they dissolve and form a solution which is a solvent for argentic chloride. Thus the inventor utilizes the base-metal chlorides formed in roasting the ore, in making a solution which dissolves the chloride of silver.

The advantages that the process has will be apparent to metallurgists, in that it allows one to use successfully finely divided ores which can be roasted at a low temperature just sufficient for chloridization, and thus avoid the volatilization of the base-metal chlorides and consequent loss of silver; and that the base-metal chlorides formed in roasting the ore are utilized as solvents of the argentic chloride; and that a maximum percentage of the silver is secured.

SUTRO TUNNEL IMPROVEMENT.—It is reported that the Sutro tunnel company has entered into an arrangement (in Europe) by which they will receive $150,000—over and above royalty and advances by Comstock companies for the lateral tunnels—for the purpose of putting a double track in the main tunnel so as to take out the low-grade ores of the Comstock. Also that a company is about to be formed for the purpose of building mills at the mouth of the tunnel and to prospect the ledges cut by and belonging to the tunnel company. The new company will bear all the expense, and the tunnel company is to receive a share of the net profits.

VALUABLE GOLD NUGGET.—Recently Mr. John Borland picked up in his gravel claim at Forest Hill, in this State, a gold nugget of the value of $500. At the same time a number of fair-sized pieces of gold were found in the sluices. Mr. B. has been engaged three years in opening his claim.

Arizona.—No. 6.

A few miles east of Tuhac, on the west slope of the Santa Ritas, is the Tyndall mining district, which embraces the principal historic mines worked by the Jesuits and Mexicans, and the rude works of the native races. At its northeast angle is Mount Wrightson, also known as Old Baldy, the highest of the Santa Ritas. The lodes which cross this district are amazing in their length and still more so in their width. One of the principal is the Empress of India, which not only runs across the Tyndall district, but on to the Aztec, which adjoins it on the east. The Empress of India mine, 4,200 feet above the sea, is three miles north of the old Salero shaft. The lode runs east and west, and for its whole length has croppings of from 100 to 300 feet. The casing is granite, the vein porphyry, gneiss and quartz, strongly colored with iron and containing some manganese. Other lodes are the Rohley, Gibbons, Salsro, Broghill, Sedgwick, McDonald, Gedge, Ahsrcorn, Blake, Hamilton, Grossett and Buena Ventura, also, in the Santa Rita valley, the Allen and Bell. The top of the shaft of the Old Salero mine is about 5,700 feet above the sea, and the Gihhons, one mile from it, and probably on the same lode, is 4,800 feet. The ore of the Bushell, Forsythe and Old Salero mines assaye as high as $400 per ton, but does not average more than $75.

The Aztec district, east of the Tyndall, is crossed by the Empress of India lode, on which are the Montezuma, Inca and Hidalgo mines. The ore is green and black silver mixed with manganese. North of the above lode, the Apache, Iturbide, Coronado, Ahundancia and Lost lodes have been located, and several mines located upon them, while south of them is the great Aztec lode, with the Aztec, Anahuac and Toltec mines. This gigantic lode is 46 feet wide on the surface at the west end of the district, enlarges to 286 feet in the middle of the Aztec mine, is from 270 to 300 ft. at the Anahuac, and narrows again at the Toltec. Here are also the Almoner and San Bruno lodes. The Aztec syndicate, the headquarters of which is at Indianapolis, owns many of the mines of this region. The Toltec Mining Co., organized in 1878, by capitalists of Hartford, Bridgeport and Waterbury, Conn., is also actively at work. It owns about 10 mines, among them the Bushell, which is believed to be the old Tumecarori mine, the Knoxville, Webster, Velasco, etc.

South of the Aztec is the Patagonia district, in the mountains of the same name, and extending from Sonoita creek to the borders of Sonora. Here are located the Kershaw, Mowry, Trench, Silver Bill, Patagonia, Holland, La Hermosa, Hardshell, and other valuable mines. The ledges are good and wide, and crop boldly out for long distances. Much of the ore is free milling, but contains a considerable quantity of copper silver glance, and some veins carry so much galena that they have to be smelted. Here are the settlements of Hurshad, with a population of 500, Washington camp with 300, and Patagonia camp.

The Tombstone district, east of the San Pedro, is now the scene of most excitement. The richness of the region had long been suspected, but the Apache was dreaded more than the gold was desired, until, in the early part of 1878, three men, E. Schieffellon, A. Schieffellon and Rich Gird, two old soldiers and a miner, resolved to try their luck. They were told before starting that they would find a tombstone instead of a mine, so, striking it rich, and finding no Indians they named the place Tombstone. Others say the name was taken from the shape of the out-croppings upon the hills, slab-like, and resembling tombstones of gigantic size. Possibly these made the miners think that they had found both mine and tombstone in one. The news of the discovery spread fast, and soon a few others joined them.

But people said that the ore was too rich to last, and that the mines would prove to be only pockets, especially as the surface formation was limestone. Nine of the best mines were offered to S. F. capitalists for $90,000 and refused. The miners themselves shared the fear, and dared not go deep. At last a couple went down 80 ft., and came to a perfect formation, with even, smooth walls, and a well-defined vein. This was the Tough Nut mine, and soon a 10-stamp mill was put up on the San Pedro to mill its ores. Then came the Contention, owned in S. F. Two shafts were sunk to a depth of over 200 ft., and some 500 ft. of levels run, and experts not usually given to exaggeration, declared that in sight in the mine and on the dumps were $3,000,000 of value. The owners have been offered $2,000,000, but declined the offer, and have just completed a fine 20-stamp mill. The ore of this mine and of the Tough Nut assays from $200 to $300 per ton, and grows better downwards. The Lucky Cuss, owned by Eastern capitalists, was developed to a depth of over 250 ft., in Oct., 1879.

Other valuable mines are the Grand Central and its South Extension; and the San Pedro, which, at the above date, was developed to 100 ft. Others are the Prompter, Ruby, Ajax, Anchor, Sunset, Mizzentop, Three Brothers, Revenne, Boston and Nanmkeag. The Prompter is from 7 to 40 feet wide, and the ore mills $300 per ton. Several tons of ore from the Three Brothers netted over $400 per ton. The Anchor is said to be richer, and to average $1,000 per ton. The nearest water accessible is the San Pedro, and the mills are situated on this river. The Sunset mine is owned in Washington, the Empire in Boston.

Tombstone has grown rapidly. In January, 1879, it contained about 350 persons, but in October the district had some 3,000, and the town, of adobe, like most southern towns, had tolerable restaurants, and a weekly paper, the *Nugget*, was running. It is above 70 miles from Tucson, and contains over 1,500 inhabitants. Ten miles from it is Charleston, with 500 inhabitants, and with the Gird and Corbin mills.

The ore of the Grand Central taken from the upper level for three days in April, 1880, assayed as follows: First day—silver, $1,013.79; gold, $110.46. Second day—silver, $570.20; gold, $50.27. Third day—silver, $620; gold, $100.

In the first week of April of this year, the amount of bullion received from the mills of Tombstone was $52,429.83. Accounts from all sources tend to prove that these mines are, on the whole, the most extensive and rich yet discovered in Arizona. The Des Frees district is at the head of a lateral canyon some four miles north of the head of the Aravaipa canyon, in the Turnhull Mts. Silver, copper and lead are the principal metals. At Stockton's pass, 22 miles from Safford on the Gila, and 12 from Camp Grant, ore has lately been found which assays to $2,300 in silver and $722 in gold. The ledge is 2 to 3 ft. wide. The Delaware and Copper King are among the mines located. These mines are near Graham's peak, 10,500 feet high, in the Pinaleno Mts.

West of the Santa Cruz valley, and intersected by Sopori creek, is the large district of Arivaca, the richness of which, as we have seen, was known in the last century to the people of Tubac. Here is the Heintzelman mine, opened 25 years ago, and thus the oldest of the modern workings in the Territory. Deserted through the hostility of the Apache, the crumbling walls of extensive buildings remain to show that work was commenced on a grand scale. The rock in this district is chiefly porphyry, and the veins, although comparatively narrow, are well defined, with strong surface croppings often rising from 10 to 50 ft. above the surrounding rocks like great stone-walls, and bear an exceedingly high grade of ores. Here are found argentiferous galena, native and horn silver, chlorides and carbonates, black metal or patangue, and in some veins gray copper and tellurium; all of high grade. Most of the veins yield gold, and in some the gold predominates. Most of the ore is free milling, but some requires smelting, every facility for which, in the shape of fluxes, is found in the district. Here are the Fairview, Ajax, Con. Arizona, Idaho, Mentor, Dos Amigos, Cerro Colorado, Heintzelman, Los Alamos, Tajo and Van Nostrand mines; also the Belmont, Home Ticket and Combination, while in the smaller Oro Blanco district to the south are the Ostrich, Orion, Sacramento, Papago Chief and others.

Within three to five miles of the Cerro Colorado are 10 valuable properties owned in Conn. About $300,000 of Eastern capital is invested in the Arivaca mines, principally from N. Y., Phil., and Ind. The town of Arivaca, 70 miles southwest of Tucson, has a population of 600, and a public school. North of Arivaca is the Pima district, with the Pima, San Xavier, Esperanza and Tinaja mines, and a population of about 150.

Dos Cabezas, 110 miles east of Tucson, is the center of a new mining district in the northern part of Chiricahua mountains. It contains 150 inhabitants, and has a public school. Three new mines in this region have been sold for $90,000, and the purchasers were highly pleased. The ore is principally gold. The best known is the Juniper, which now has a shaft 80 ft. deep, in good free milling ore.

Northeast of Tucson, 12 miles, is the Santa Caterina district, and northeast of this again the Old Hat district. Close to Tucson are the recently discovered districts of Tuscon and Rincon which, with the Santa Caterina and Old Hat districts, are situated in the Santa Catarina and Rincon mountains, whose lofty crests sweep boldly round the Santa Cruz valley. Fifty miles north of Tucson is the San Pedro district, with 150 people. Gold, silver, copper and lead occur. Huachuca district, in the mountains of the same name, 25 miles east of Patagonia, and southwest of Tombstone, has a population of 500, and contains some flourishing mines. This district, as well as many of the previous ones, has sprung into notice since the railroad reached Yuma.

RAILROADS IN OREGON.—The greatest activity is manifested in Oregon in projecting and building railroads. We learn that the Oregon railway and navigation company has five surveying parties in the field in eastern Oregon and in Washington Territory engaged in locating several projected lines of railroad. One of the plans of the company is to construct a road from the city of Portland to the Dalles, and the work is to be undertaken immediately; and in order to hasten the work, one party of workmen will begin at the Dalles and work westward, while the other begins at Portland and works eastward. In the course of the road there will be three tunnels—two between the Dalles and the Cascades, and one between Portland and the Cascades. Each tunnel will be about 900 ft. long. It is intended to have the road completed in time to move next year's grain crop.

Hydraulics.

Written for the PRESS by A. MYERS, Hydraulic Engineer.

Size of Pipes.

The trouble before was the pipes were so small that nearly all the force of the water was required to force the water through the pipes, or the power of the water was consumed by the friction along the sides of the pipe. The same difficulty was here met in applying high heads to mechanical purposes. The pipes need were too small and no power would develop; the pipes would collapse and cause great wonderment. The pipes being full when the water wheel would start, it would discharge from the pipes faster than it could be supplied from the head, and hence a vacuum would occur in the pipe and the pressure of the atmosphere on the outside of the pipe, being equal to 15 pounds to the square inch, would cause the pipe to collapse. This was a great mystery how to overcome the trouble, and to secure the advantages desired required days and nights of thought.

The difficulty is solved: Make your pipes large enough to overcome the friction of the water along the sides of the pipe. What is the relative proportion necessary to accomplish this necessity? By long experience we have been able to determine these proportions, and all of our applications in the last ten years have been eminently successful.

There is a proportion that is essential, and any variation from it hazards the enterprise. To fully describe these would require more space and time than we can here afford. In fact conditions differ, and each case requires its special calculations—necessitating the use of a qualified hydraulic engineer.

Some few years ago it was thought an impracticable thing to apply very high heads to mechanical purposes. Forty feet was considered the limit of all water powers, as it is almost impossible to confine water in a wooden penstock higher than that hight; but since the dawn of the new era, 100, 200, 300 and even 400 feet have been used with more or less success.

The maximum pressure varies, as it is applied to the different mechanical devices to transmit power derived from water. Water engines and tangential or "hurdy gurdy" wheels have been used with considerable success from 100 to 400 feet, but the power derived from them is by no means an adequate percentage; the impact being the only power realized makes the percentage very small. Hence they can only be used where the quantity of water is very limited and from very elevated falls.

Different Motors.

The first efforts to use water as a motor from high heads was by its use on a double over-shot, one placed above another. This was very expensive and very dangerous, and was little used. The few instances after they were first built and became dangerous from decay and weakness, were never renewed. Water engines were then tried and thought for awhile to be a success, but it was soon discovered that however great care was taken all the grit or sand or fine particles of silica could not be removed from the water before applying it to the engines, hence, wherever grit came in contact with the surfaces of the engine it would abrade the parts, and by constant use the parts of the engine wore away very rapidly, thus destroying the engine in a very short time. Another trouble was experienced in the fact that water being a solid and not elastic as steam or air, there was a continual pounding of the piston and thus tending to rapid disintegration, so that the water engine was very soon abandoned. Next in order was the tangential wheel or "hurdy gurdy." Some of these wheels have been very successful, and with a limited amount of water and very high head have given very fair results. But the highest efficiency of water cannot be realized in this way, but it is possibly the only plan or at least moderately efficient with the economy of the arrangements. To exceed 33% or 40% of the power of the water by this plan would be considered an excellent achievement. Where water is ordinarily abundant and high or very high heads, it would be far more economical to divide the fall into 2, 3 or 4 heads and use a properly constructed turbine built especially for the position. Turbines have proven the most satisfactory of all appliances heretofore used. The variety is very large and the experience with each variety has been satisfactory in proportion to the intelligence of the operators in setting them up. Many very good turbines by being badly handled have proven serious failures, while others with less merit, more intelligently managed, have given satisfaction and been a success.

Horizontal Flume.

For the last seven or eight years the horizontal flume has been in demand. This is our own invention, and while we speak of its merits, we will try and be as modest as the merit of the invention and our connection with it will permit.

The success of the turbine in our hands had brought us into general notice, and many of the mining difficulties were given us to solve. Prominent among them was the difficulty of using satisfactorily long bevel gear in transmitting the power of the water wheel from a perpendicular shaft to a horizontal one. These bevel gearings were very expensive and would often break, and the mill would be detained for days and weeks at great expense as well as inconvenience. To obviate this trouble and transmit the power, I suggested the horizontal wheel.

The first one put up in this manner was a 52-in. wheel under 38-ft. fall and aggregating 444 horse power, in the Eureka mill, on the Carson river, near Empire City, Nevada. It was a grand success, and from the day it first started to this has never delayed the mill on account of the wheel being out of order. The power was transmitted by a pulley on the horizontal shaft of the wheel, of 10 ft. in diameter and 3 ft. wide. The belt had to be made for the occasion. This manner of using turbines is equally advantageous for very high heads, as it dispenses with the bevel gears, and power from a high-speeded shaft can be more successfully transmitted by belt from a properly constructed pulley. To secure the greatest efficiency under any head, every circumstance connected with the experiment must have its due consideration. The wheel must not be too large or too small for the quantity of water under a given head. The pulleys and shafting must not be either too large or too small. One or the other will materially affect the working of the wheel. The pipes also, that conduct the water to the wheel from the reservoir above, have to be of proper size and capacity, and the wheel has to be constructed for the position; then success is as certain as can be reasonably expected from any good boiler and engine, well made and properly set up.

The horizontal wheel, when the draft tube is perfect, gives the highest possible power from the water used, because the spouting velocity of the water through the wheel is *perfectly* uniform at every point. With the draft tube attached as in my case, no air can get into the draft, and a perfect vacuum must exist; hence, each infinitesimal column of water will find its appropriate column of water in the draft tube, and thus, where the greatest impingement is, there will be the greatest spouting velocity. The greatest impingement is at the tips of all the buckets, the lower buckets having the same spouting velocity as the upper ones, because the water passing the lower ones have the exact pressure as the upper ones. The column from the buckets to the top, added to the column from the buckets to the bottom of the draft tube, are equal, thus making perfectly uniform velocity. No upright wheels have so uniform a velocity, because the velocity will be different as the difference of the pressure is between the bottom and top of the wheel. Since this case has been so successful, numerous imitations and infringements have been thrust upon the trade. Persons who have no manner of conception of the first principles of hydraulics, will throw their crude conceptions on the public, guaranteeing their superiority, etc.

The horizontal wheel is now thoroughly established, and most miners will see that their specifications contain provisions for Myers' horizontal flume, and then see that they are not deceived by some cheap and indifferent infringement.

THE Ponca Indians have commenced suit in the United States Courts of Nebraska and Dakota to quiet title to their reservation.

REPORTS from the Sacramento river say the run of salmon is very light, and the probabilities are that the best of fishing for the season is over.

Olive Oil-Making Machinery.

We give on this page two engravings copied from a foreign work on the olive, one showing an improved style of mill for crushing the fruit, the other a press for extracting the oil from the pulp. Fig. 1 is the improved Italian grinding mill, having two circular stones centering on a common shaft, one each side of a vertical shaft, which turns on its pivot below, and is stayed to the cross beam above. The horse is attached to the clevis on the right, and as he treads the circle the two stones revolve upon their common axis, and one follows the other around the circular basin in the stone bed, which is shown in section in the engraving. Of course the crushing is done by the weight of the stones as they revolve upon it. The primitive style of oil mill had but one stone, and the improvement consists in placing a stone each side of the vertical post.

Fig. 2 shows one form of press used for forcing the oil from the pasts which comes from the mill. This pasts is put into bags made of the tough Esparto grass, which are put one upon another sometimes, with an iron plate between them, and thus a number of bags are pressed at once beneath the same screw. The appearance of the bags when pressing begins and when it is finished is shown by the engraving. The empty press upon the left shows the construction of the bottom plainly. The press is made of strong timber with iron screws and nuts. These figures will give our readers who are not familiar with the subject some little idea of the chief machinery employed in obtaining the oil from the fruit. At some other time we may find space for mentioning some of the different methods of oil making which prevail in Europe. We have also been promised a description of Mr. Elwood Cooper's machinery and methods, used by him at his establishment in Santa Barbara.

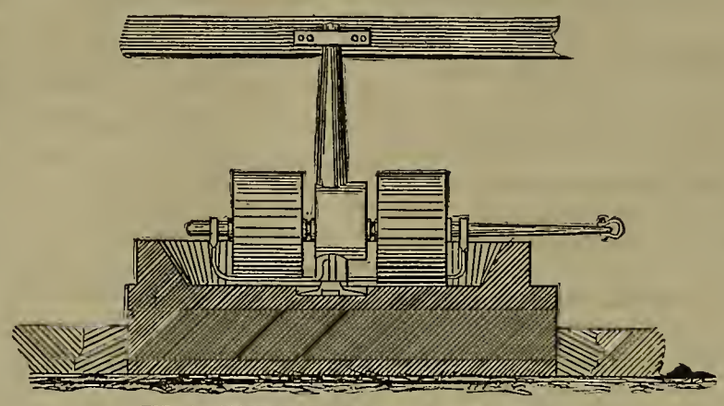

FIG. 1. IMPROVED ITALIAN OLIVE OIL MILL.

AN IMPORTANT INQUIRY.—Our representative, Horace Davis, lately introduced a resolution directing the Sec'y of the Treasury to report to the House "what causes, if any, are tending to diminish the tidal area of the bay of S. F., and what action, if any, has been taken by the Government of the U. S., of the State of Cal., or by corporations or individuals, which will tend to lessen the tidal ecour on the bar of S. F., and thereby decrease the depth of water on said bar, and diminish the value of S. F. as a commercial harbor." This inquiry will open the whole question of the effect of debris from the mines upon the harbor of S. F., and at the same time will clear the way for the scientific and, of course, intelligent discussion of local problems which have hitherto been discussed without proper data. This inquiry will place the matter fully before Congress; and it is fair to hope that the proof of serious danger to this magnificent harbor will lead to immediate action.

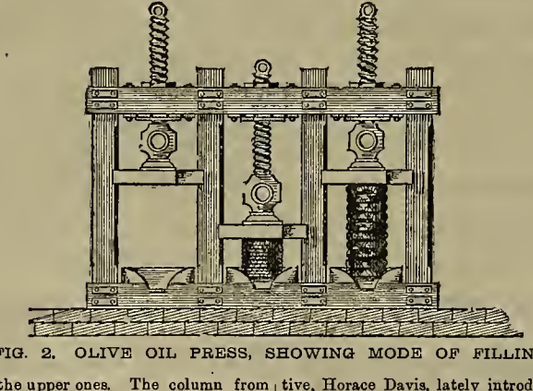

FIG. 2. OLIVE OIL PRESS, SHOWING MODE OF FILLING.

THE international rifle match between Ireland and America will take place at Dublin, June 27th and 28th.

DR. ALFRED SWAINE TAYLOR, the well-known English toxicologist and writer on medical jurisprudence, is dead.

Placer County Mines.

The Newcastle hydraulic mine, a description of which was given in the PRESS a few weeks since, made its first clean up on the 29th ult. after an experimental run of 10 days. The result was a bar of gold worth about $2,100. This establishes beyond all question the value of the mine, and it will probably yield from $7,000 to $10,000 monthly as soon as the sluices are lengthened and other contemplated improvements made.

The Alabama company have had 10 tons of their rock taken at a depth of 160 feet on their ledge at Penryn, milled at the Julian mill. It yielded $8 per ton in free gold and 2% of concentrated sulphurets assaying $150 per ton. The ledge which at the surface was 3 ft. thick has widened to 5 ft. at the bottom of the shaft which is now down 173 ft.

Several rich strikes have been made in the ledges on Duncan Hill, one mile and one half southwest of Auburn during the last few weeks. A system of parallel east and west ledges cross the hill about 200 ft. apart.

The Shurtleff vein on which Mr. A. Shurtleff owns 2,000 ft. has been prospected the most thoroughly. Its average width is 2 ft. and the pitch 65° to the south. The ledge has been prospected by a tunnel 530 ft. long, open cuts in the croppings and two shafts each about 80 ft. deep. The vein quartz is rotten and decomposed down to the greatest depth the mine has yet been opened, 250 ft. The ore shows free gold and has milled on the average $25 per ton. That at present being taken out at a depth of 80 ft. mills $100 per ton.

To the south of the Shurtleff and distant 200 ft. is the Conrad mine, bonded to Messrs. Roberts & Co. who are working it. The vein pitches 55° south, and is 2 to 2½ ft. thick. It has not been prospected much yet, the shaft being down only 75 ft. The rock shows free gold and is much harder and less decomposed than in the Shurtleff vein. The first 20 tons crushed yielded $106.50 per ton.

Thorp & Co. own the next location on the south on which they have sunk a shaft 215 ft. They are now running a tunnel to drain the shaft. The ledge is similar in character and prospects to the Shurtleff and Conrad.

At the iron mine near Clipper Gap, a large force of men are employed laying the foundations for the furnace, building house, etc. It is expected that the iron will be running by September.

MINING OUTLOOK IN UTAH.—The accounts of mining prospects in Utah Ter. are of a highly encouraging character. The daily receipts of bullion and ores in Salt Lake city prompts the *Tribune*, May 29th, to say that the mining outlook in Utah is not surpassed by that of any other State or Territory. It directs attention to the fact that comparatively a small number of men are engaged in mining; that only a few assessments are levied; and that, as a rule, mining work has been superficial, in justification of its boast. It says there are not half a dozen mines in the Territory which have attained any depth, and that generally mining operations have been carried on by poor men unaided by capital. This has been possible because the miner finds a ready sale for his ore in Salt Lake city, and the facilities for getting them to market have been fairly good. The few mines which have been sold abroad worked injury rather than good to the Territory. The most notable in the lot is the Emma mine, which now promises to show that it is not a swindle, however much swindling may have been achieved in connection with it. Within the present year the Emma is likely to prove that it is a good, honest and productive mine. While there is no excitement in Utah, the mining interest is progressing in a quiet, business-like way, which is entirely satisfactory to all concerned.

HOT WATER OF THE COMSTOCK.—It is doubtful if any mining operation in the world, at any time, presented any difficulty at all comparable to that which is encountered in the mines of the Comstock from the influx of hot water. It is the worst enemy which has yet appeared to tax the ingenuity of the managers, and to exhaust the patience and the substance of the shareholders. The *Enterprise* says it not only steams and burns, at times making work almost impossible, but it puts out the fuses in spite of every precaution. The ordinary fuse yields at once to the penetrating power of the hot water; even a solider fuse, specially prepared for the work, cannot withstand the hottest water. Against such a powerful element the utmost efforts of the miner avail but little, and there is small cause for wonder that progress is slow and the attendant cost great. The wonder should be rather that work can be done at all under such a supreme difficulty.

NEW YORK MINING EXCHANGE.—The American Mining Stock Exchange was formally opened at New York, June 1st. It is located at No. 63 Broadway. The opening address was made by Mr. Geo. W. Smiley, in the course of which he gave a detailed history of mining operations in the principal mining fields of the country. Speeches were made by Gov. Milton S. Latham and others, after which it was announced that the exchange was ready for business.

The Lost Placers.

There is something very singular about the lay of the land and the mineral condition of things in this vicinity, judging from the standpoint which would naturally be taken by a placer miner who had experience in surface work in the early days of California, when a good prospect in the top soil in almost every instance led the miner unerringly to a rich quartz vein, and perhaps to a big pocket. At the head of nearly every gulch that was more than ordinarily rich in surface gold, valuable ledges of quartz have since been found; and hills that contained gold-bearing rock in any quantity had paying placers along their bases. Of course there were some exceptions, but the rule that "quartz is the mother of gold, and that gold always goes down hill," was so generally applicable that an apparent exception to it excited comment and sometimes considerable wonder. Gold is often found, however, in places so remote from localities from which it might have come, that the miner is sorely puzzled and tempted to knock in the head all his preconceived theories. The California aphorism, "Gold is where you find it," was suggested by instances of this kind. On the summit of Bear mountain—a lofty peak about 10 miles from Sonora, on the Stanislaus river—smoothly washed gold has been found from time to time, and the question of how it came there has long been a puzzling one, there being no higher land adjacent. The explanation adopted is that the mountain was thrown up at a period subsequent to the formation of the river placers at its foot, but this theory is not supported by the geological formation of the mountain itself, which is apparently much older than anything in its immediate vicinity and existed long before the Stanislaus had cut its way toward the sea through the grand canyon just below. But we digress, as the cheap lawyers say. We started out with the intention of saying something about the placers we ought to have about Aurora, and inadvertently drifted into the sublimities of geology. Last Chance hill was wonderfully, fabulously, rich on the surface. It is not exaggerating to say that the bullion known to have been shipped from here through the expresses and banks, of which a record was kept, represented not more than three-quarters of the total amount extracted; for the facilities for stealing were unexceptionable here in the flush times, and many a fat pocket was worked out, of which parties not interested never heard. It was said that "a hand-mortar was going in every cabin at night," and it was a fair supposition that many of them were being run on the rich specimens that had been secured during the day, honestly or otherwise.

On Middle hill were found boulders of float rock that frequently yielded $1 a pound and upward in free gold; and Silver hill, especially in the vicinity of the Antelope, yielded many very rich deposits near the surface. On Last Chance much of the gold was found absolutely free, in quartz so decomposed and friable from oxidization that it could be crushed by the hand and the gold left clean in the hand by a few puffs of the breath. The huge croppings in many instances contained rich bunches of decomposed quartz several ft. above the surrounding surface ground. In view of these facts, is it not a fair and plausible supposition that there ought to be some valuable surface mines somewhere in the immediate vicinity of the places where so much rich quartz was found? If the hills have been eroded and their surfaces disintegrated by the action of the elements, the particles which once composed rich ledge croppings, must have gravitated to a lower level, and still exists in some gulch which has been concealed by slides or wash-outs or some natural convulsion which has left no trace. Willow and Cottonwood gulches have never been prospected that we can learn. We are told that a shaft was once sunk in the former to the depth of 16 ft., when the work was abandoned because of a lack of gruh and a flux of water, hut no bedrock was reached. The fact that no placer or gulch diggings have been found is the most singular circumstance connected with the history of this camp. It is just as certain that there are rich diggings somewhere around the foot of the Last Chance hill as it is that an atom of gold was ever found there, for it is utterly impossible for that hill to have been so rich ou the surface without throwing out gold enough to make good placers. If any man or company ever bottoms Willow gulch, they will reap a richer harvest than was gathered here in the palmy days. For it is a fact which does not admit of argument, though some scrub of an "expert" might sneer at it, if there is no gold in the gulches around Last Chance there never was a color found on the hill, and all the stories about the former wealth of Real del Monte and adjacent mines are fabrications.

INTERESTING MINERALS.—Lately the editor of the Tombstone *Nugget* has been shown minerals of several varieties not usual or abundaut in any camp. Among these was a specimen of molydate of lead, haviug the true acicular crystals of molydenum. Also specimens of telluride ore, of the graphic variety, but not choice or rare specimens. Again, another specimen which is pronounced bismuthinite, containing paying quantities of both silver and gold. In counection with several samples presented we have seen fluor spar, the genuine blue-John of the Cornish miner.

Business Directory.

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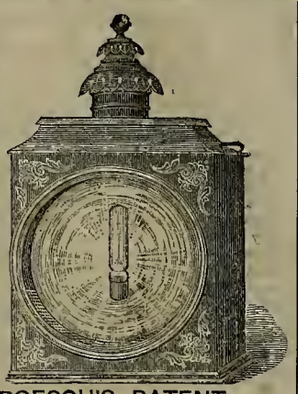
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In witness whereof we have hereunto set our hands and seals, this first day of May, A. D. 1880.
GEORGE SPAULDING,
J. MUNROE MILLER,
DWIGHT GERMAIN.
State of California. } ss.
City and Co. of San Francisco. }
On this twenty-seventh day of May, A. D. 1880, before me, Sam'l S. Murfey, a Notary Public, in and for the said City and County, residing therein, duly commissioned and sworn, personally appeared George Spaulding, J. Munroe Miller and Dwight Germain, known to me to be the persons described in and who executed and whose names are subscribed to the within and annexed instrument, and they each acknowledged to me that they executed the same.
In witness whereof, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written. SAM'L S. MURFEY, Notary Public.
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WILLIAM A. STUART, Clerk.
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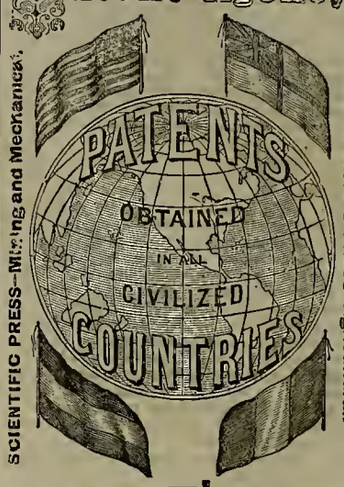

PATENTS obtained promptly; Caveats filed expeditiously
Patent re-issues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Solicitiug Business promptly and thoroughly conducted.
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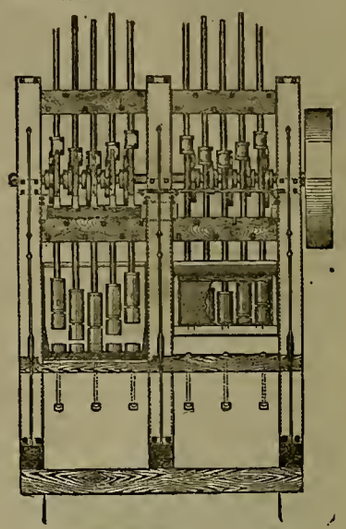

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING MAY 18TH, 1880.

227,703.—ICE-MAKING APPARATUS.—C. C. Palmer, S. F.

FOR THE WEEK ENDING MAY 25TH, 1880.

228,013,—OPENING GATES.—H. Allen, Silverton, Ogn.
228,032.—LEACHING ORES.—D. W. Brunton, Silver Peak, Nev.
228,035.—ELEVATOR FOR HEADER—T. J. Chappel, Gilroy, Cal.
227,967.—AUTOMATIC CUT-OFF—C. V. B. Downing, S. F.
227,893.—ELEVATOR—C. H. Golding, Bodie, Cal.
227,896.—RAIL JOINT—S. Harris, S. F.
227,982.—HAME RING—A. J. Larsen, Santa Paula, Cal.
228,036.—THILL COUPLING—W. A. Levanway, Oakland, Cal.
227,918.—VALVE MOTION—E. O'Neil, S. F.
227,991.—PLOWSHARE FASTENER—J. P. Patery, Dunnigan, Cal.
227,926.—EDGER—J. R. Rooh, San Jose, Cal.
228,140.—OBTAINING GOLD FROM ORES—A. C. Tichenor, S. F.
227,935.—ANIMAL TRAP—W. J. Webher, Hollister, Cal.
227,981.—OVERALLS—S. R. Krouse, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

HORSE HITCHING DEVICE.—Reuben Seidere, 737 Howard St., S. F. This invention relates to an improved device for securing horses at points where it is neceeeary to leave them; and it consists in the employment of a rod, one end of which may be dropped upon the ground at will. The other end is hinged to a elide which moves in a hollow harrel or guide, eaid guide being eecured beneath the vehicle in a horizontal position. A rod is secured to the elide and extends toward the front, having a loop or ring to which a line may he attached and led to the horse'e hit. When a etop ie made the binged rod may he let down eo that ite end reete upon the ground, and any forward movement of the horee will draw the eliding rod hack into the tuhe or guide, thus pulling upon the rein or line, and the horee's mouth. A epring in the rear of the tuhe forces the rod forward when the horse hacks or the strain is relieved. Thie device has heen applied to a numher of vehicles, and the inventor informs us that the reeults are very eatiefactory.

PLOWSHARE FASTENER.—Jacoh P. Patery, Dunnigan, Yolo Co., Cal. Patented May 25, 1880. No. 227,991. The mold-board and land-eide are fastened to the ehare hy levere provided with cams or catches. The mold-hoard ie secured to the curved heam and the land-eide hy meane of braces, the lower edge of eaid mold-hoard reeting on a flange on the upper edge of the laud-side. On the end of the hrace is a fulcrum of a compound lever, the emaller arm of eaid lever heing pivoted on a ewinging arm. On the end of this smaller arm is found a hook which grasps a etud on the under eide of the share. A slot is found in the end of the hrace and another in the end of the land-side, into which fit the studs found on the share, thus eteadying the ehare.

ANIMAL TRAP.—W. J. Webher, Hollister, San Beuito Co., Cal. Patented May 25, 1880. No. 227,935. This trap ie intended for the capture of animals, hirds, etc., and it consiets in the employment of one or more needlee or eharpened spears, moving in guides and provided with an elastic epring by which the needle is forced forward when released hy the action of a trigger. This trigger is operated hy the attempt of the animal to pass ite free end, and this end is concealed hy a etalk, weed, or any natural object. In combination with these devices a guard or protector is employed to be used while the trap is heing eet or carried about.

OVERALLS.—Samuel R. Krouse, S. F. Patented May 25, 1880. No. 227,981. This invention relates to certain improvements in the manufacture of overalls and that clase of garments intended for outside wear; and it consists in an improved conetruction and application of etrengthening-etrips, ataye, and re-enforce piecee hy which the hody of the fahric, pocket cornera and seams áre etrengthened, the parts are united to form a more complete mutual hand or support, while from their form a considerable economy of material is effected in the cutting of theee parts.

WALLACE'S tannery and shoe factory, at Rochester, N. H., were hurned May 27th. Loss, $50,000; partially ineured. Four hundred hands were thrown out of employment.

MISS MARY ANDERSON gave 238 performances during her dramatic eeason, which hegan Sept. 8, 1879, at Utica, and ended May 8, 1880, at Portland. The total receipte were $242,619.

The Economic Value of Truth.

We had supposed that the jonrnaliem of thie coast had well outgrown the diepoeition toward indiscriminate glorification of the country which wae the feature of our traneient literatnre a few yeare ago. We had enpposed that the folly of trumpeting everything favorable and whispering everything unfavorable had heen clearly seen and ahandoned. We believed that the conclusion had heen reached hy journalistic writers that population gained hy exaggeration of good thinge, and euppression of all reference to disadvantages in the country, wae altogether uneatisfactory. We had eupposed another tack had heen taken in the jourualietic couree, and that we had all agreed together that it ie hetter hy far to huild up the country more elowly hy telling people the exact trnth ahont our indue-tries and resources, and trusting to their own good eenee to he satisfied with California, as it really is, rather than to he continually peering ahout for the California which imaginative writers deecribed, and which no one ever eaw.

We have received a letter from a Los Angelee correspondent which indicatee that there is eomething of the "never tell" doctrine prevailing in that county, and he givee clear illustrations of the effect euch a policy exerte upon the very intereete which the journals really wish to promote. The State has unqueetionably heen eeriouely damaged hy ite friende in this regard, and there ehould he a general dieposition to remedy the old evils and guard againet more of them hy a courae of dieintereeted truth-telling concerning all mattere pertaining to our industries and the conditions under whicb they are pursued. The truth ahout California ie good enough to eatisfy any reasonahle man, and the truth will hring to our vacant areas men who will he forewarned of dangere and will overcome them hy wiee action and forethought here, ae they did in their old homee at the East. If there he any California newepaper which hae not already adopted a policy of this nature, we bope it will not long delay to act upon it. Of course there ie principle involved in such a couree, hut one need not delve to the principle to diecover the fact that the policy of half truthe ie altogether unprofitable.

There may he cases in which the course of a journal ie shaped by the apparent demande of personal proprietary interests. Wherever thie is the caee it is the misfortune of the community and of the State. A man who writes from his pocket rather than from hie head or his conscience ie poor acquieition to a neighhorhood. He does great evil, for although the immediate neighhore may recognize hie motive power and make allowance for it, there is a wider circle heyond in which his jornalietic policy doee great harm. The eame principle appliee when journale lead themeelvee to the pereonal or hueiness advancement of individuals in other waye than in inducing the immigration of the unwary. The producing intereete of the State are often much injured hy forecasts of produce or of prices made hy thoee whoee interests lead them, unconsciously oftentimes, to promulgate certain statemente without due qualification according to contingencies involved.

All this clase of intentional or unintentional misrepresentation ie false to the true office of journalism. Truth ie the editor'e most trenchant weapon. The public interest alone ehould be his master. Personal epites and grievancee can degrade the proudest jornal into a petty, peevieh, personal organ. Personal intereets never fail to transform a eheet which should he the exponent of the people'e progress, into a worthless medium for advertising pereonal lande or wares. How any editor of decent heart, and fair respect for the reeponsihilitiee of hie poeition, can conceut to make his experience and talents eerve eo low a standard of journalistic ethics ie beyond our power of comprehension.

Let us have journals for the public good: this alone can he the true test of value. And let it clearly appear, hoth to the people who own the journals and to thoee who read them, that there is no laudahle interest either puhlic or private; that there is no success which can he real and lasting, which can he eerved or secured, except hy the enshrinement of truth in journalistic halle and hearts.

DEATH OF A NOTED JOURNALIST.—Panl Morrill, the last survivor of the well-known firm which puhliehed the famoue Sacramento *Union*, died in this city May 27th. At the time of his death Mr. M. was U. S. Surveyor of this port. He was a practical printer, and hefore Cal. hecame an Amcrican State he was one of the pnhlishere of the N. Y. *True Sun*. In 1851 Mr. M. hecame a memher of the *Union* firm, and that relation will he long remembered; for that journal was alwaye an ahle, faithful and hrave champion of the people, and exerted a powerful influence for the right throughout the State and the coast. To eay that Mr. M. was one of the puhlishere of the *Union* is his worthieet epitaph.

As will be seen hy advertisement in another column, Mr. W. E. Hale hae in connection with his other hueinees, eetahliehed an Arizona and California Mining Agency. The firm of Hale & Pacheco ie well known in thie city, having heen in husinese for a long time. Mr. Hale will take charge of any mattera connected with California and Arizona mining affairs, and attend to them eatisfactorily.

News in Brief.

THE weather at Waehington wae the hottest ever known there in May.

SINCE the let of May the Apaches have killed 78 whitee in New Mexico.

RUSSIAN preparatione for a war with China are etill actively going on.

A MILLION hrook trout have been placed in Minneeota streams thie year.

A ROCHESTER court decides that a woman hae a right to open her huehand'e letters.

A PHYSICIAN'S cat in Wolcotville, Conn., hae adopted a rat in place of a loet kitten.

BENJAMIN F. BUTLER wae the gueet of the Mormons during hie etay in Salt Lake City.

EX-SENATOR GORDON, it ie reported, is to accept the presidency of a Georgia railroad.

THE liahilitiee of the hanking houee of M. P. Freeman & Co., of Elko, are reported to he $80,000.

THE French Government has resolved to hanish active foreign Socialiste.

THE alleged Broomfield murderers have been held to answer at Walla Walla, W. T.

THE Philadelphia *Chronicle* noticee that red parasole have made their appearance upon the streets.

A DEADWOOD (D. T.) diepatcb eaye the Indians in the vicinity of the Little Miseouri river are on the war path.

SECRETARY SCHURZ expreesee the conviction that at no distant day Indians will he claseed as American citizene.

ACCORDING to the *Silver State* late froste in some parts of Nevada have killed the fruit, including plums and apples.

THE Manchester *Guardian* published a conciliatory leading article on the British American fisheriee question, May 28th.

HERR ALBERT GULDENSTEIN, the Jewiehecnlptor at Stuttgart, has, received from the Emperor of Auetria the gold cross of merit.

IN thie city Ceneue Supr. Langley received 200 applicatione from women to he appointed enumeratore, hut none were appointed.

TWO Nihilists were eentenced at St. Peterehurg May 27th to be hanged, and eeveral othere to hard labor in the mines and hanishment to Siheria.

FRANCIS W. G. BELLOWS, formerly Vice-Pres. of the Panama Railroad Co., and aleo of the Pacific Mail Steamship Co., died May 25th, in N. Y.

AGENT NICKERSON informe the Aehland (Oregon) *Tidings* that the Klamath Indians loet about one-half tbeir horees and cattle during the past winter.

A NEW YORK letter says the improvement in real eetate during the past two yeare ie really marveloue, and the prospecte now indicate a continued advance.

AMONG the euccessful candidatee at the Boeton bar examinatione of the Apr. term was Kanro-kura Nakayama, a Japanese, wbo eatisfied all the profeesional requiremente.

THE Gunnieon *News*, the first newepaper puhliehed in Gunnieon valley, Colorado'e new mining attraction, had ite firet paper strnck off and eold to the highest hidder.

AT West Berkeley, May 27th, Dr. Chae. B. Chapman, committed suicide, hecauee he helieved he had fatally injured a woman patient from whom he had removed a tumor.

THE Bodie *Standard* telle of a man who located a ranch on a emooth field of snow in Mill Creek canyon, and found that when the enow dieappeared he had fenced in a lake.

A BILL now pending in the House of Repreeentatives provides for pensioning persons who have eerved fifty yeare in the civil hranch of the Government, and eeeme likely to pase.

THE Turkish tax collector has nearly ruined Paleetine, and ite wretched people fear to cultivate the soil. Every eighth egg is taken hy the Government; and, as all frnit treee are liahle to he taxed, none are planted.

PROF. T. C. MENDENHALL, of the Imperial University of Japan, at Tokio, hae accepted the invitation to resume his old poeition as Prof. of Phyeice in the Ohio State University, hie term of service to hegin Sept., 1881.

Bullion Shipments.*

Since our last issue, we have noticed the following hullion ehipments:

Golden Terra (Black Hille), May 27th, $15,000; Hilleide, May 28th, $4,000; Con. Virginia, May 29th, $65,871; Star, May 31st, $1,811; Hillside, June 2nd, $2,500; Northern Belle, Jnne 1et, $7,819; from Nevada City for the month of May, $105,000; May 28th, saya the *Times-Review* (Tuacarora), two hare valued at $6,000 were eent from the Yonng America South.

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*Desiring to make our list of Bullion Shipments as complete as possible, we will he thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

New Incorporations.

The following companies have heen incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

PACIFIC STOVE AND IRON WORKS CO.—Object: To buy and sell stoves and stove trimmings, and import, manufacture, and buy and sell malleahle castings of all kinds, together with tin, copper, etc. Capital, $100,000. Directors—G. Plummer, Samuel McKee, Michael Foley, T. E. Keogh, W. O. C. Shade, M. G. Kenuedy and W. B. Wadam.

FAVORITE G. & S. M. CO.—Capital, $10,000,000. Directors—Chas. G. Herman, V. Repoyre, C. H. Redmond, O. Wolff and Thos. Lawrance.

UNCAS M. CO.—Capital, $1,000,000. Directors—T. J. Brower, S. H. Mather, J. M. Walker, C. E. Gillette and J. H. Colman.

The Compound Oxygen Treatment.

The number of people who are "neither sick nor well, as the saying is, make up a large proportion of nearly every community. If you ask what ails them, you get no clear answer; for they do not know themselves. They are uot sick enough to be classed with invalids, and yet they are not well enough to enjoy life nor to do any physical or mental work without a wearisome and exhausting effort. For, most of the time they feel miserable and forlorn; every task is a hurden; they have no zest in life, and little hope in the future. These unhappy people get little or no relief from physicians, but are made rather worse hy the tonics which are too often prescribed, and which leave the vital forces at a lower range after the temporary stimulation has subsided. The seashore and the mountains afford but a passing relief. Now, an agent that can restore this vital activity must, in the very nature of things, gives back health to the suffering invalid. It must act as a new and stronger mainspring would act on the machinery of the watch. That such an agent has been discovered, is no longer a matter of doubt. It is to he found in what is known as COMPOUND OXYGEN, which acts directly on the great nervous centers, rendering them more efficient, vigorous and active, and capahle of generating more and more of the vital forces, which are life and health. The cures which have followed the treatment of diseases by this new agent during the past ten years, seem often more like miracles than cases of natural healing and restoration. We have estahlished a Depository of our COMPOUND OXYGEN HOME TREATMENT at San Francisco, Cal. This will enable patients on the Pacific coast to obtain it without the heavy express charges which accrue on packages sent from the Eastern States. All orders directed to H. E. Mathews, 606 Montgomery St., S. F., Cal., will be filled on the same terms on which we fill orders sent directly to our office in Philadelphia.—DRS. STARKEY & PALEN.

In the Whole History of Medicine

No preparation has ever performed such marvelous cures, or maintained so wide a reputation, as AYRES' CHERRY PECTORAL, which is recognized as the world's remedy for all diseases of the throat and lungs. Its long continued series of wonderful cures in all climates has made it universally known as a safe and reliable agent to employ. Against ordinary colds, which are the forerunners of more serious disorders, it acts speedily and surely, always relieving suffering, and often saving life. The protection it affords, hy its timely use in the throat and chest disorders of children, makes it an invaluable remedy to be kept always on hand in every house. No persou can afford to be without it, and those who have once used it never will. From their knowledge of its Composition and effects, physicians use the CHERRY PECTORAL extensively in their practice, and Clergymen recommend it. It is absolutely certain in its remedial effects, and will always cure where cures are possible.

FOR SALE BY ALL DEALERS.

A SEMI-TROPIC FARM NEAR SAN JOSE.—The farm of Mr. Chas. Fieldsted is situated on the sunny slope of the Coast range, about five miles east of San Jose. He has quite a number of orange trees of different sizes growing, most of which are looking well. Some, already in hearing, have produced well of fair fruit. He has also lomons, limes, figs, English walnuts and many kinds of ornamental trees growing on his grounds. His carp pond is supplied hy springs of excellent water. The springs are constant and well situated for irrigating. Located in the warm helt, accessible to a large population, Mr. Fieldsted's is a rare farm. Such places are seldom offered for sale, and we can recommend purchasers to examine his offer made in our advertising columns. He will sell either 40 or 80 acres as desired.

Pocket Mining Atlas,

Containing the principal mining districts in the United States. Complied from the latest official surveys and the most authentic sources hy Edwin Bolitho. Sent, post-paid, on receipt of $1. Address, Dewey & Co., 202 Sansome St., S. F.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruher's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Chew JAGRSON'S BEST Sweet Navy Tobacco.

Mining and Other Companies.

Persons interested in incorporated ehares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

San Francisco, June 2, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, Dividend No. 10 of Seventy-Five cents (75c.) per share was declared, payahle on SATURDAY, June 12, 1880, at the office in this city, or at the Agency of the Nevada Bank of San Francisco in New York.

WM. WILLIS, Secretary.

Office—Room No. 29, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

Office of the Spaulding Gold and Silver Mining Company—A Stock Dividend has this day been declared, pay-

able to the Stockholders of this Company, on and after the 10th day of June, of three shares of the Republic Mining Company's stock for each five shares of this Company's stock, on presentation of the certificates of stock of this Company.

JOHN HEIN, Secretary.

Office—117 Battery street, San Francisco, Cal.
Saturday, May 29, 1880.

Spring Valley Water Works.

The Annual Meeting of the Stockholders

OF THE

SPRING VALLEY WATER WORKS,

For the election of Trustees for the ensuing year and for the transaction of such other business as may be brought before the meeting, will be held at the office of the Company on

WEDNESDAY, JUNE 16, 1880, at 12 M.

By order of the Board of Trustees.

WM. NORRIS,
Secretary.

Atlanta Mining Company.—Location of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 29th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, May 21st, 1880, and day of sale to Wednesday, June 23d, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, June 24, 1880, and day of sale to Monday, July the 19th, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

Gover Mining and Milling Company.— Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Fifth day of May, 1880, an assessment (No. 49) of 20 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of June, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the Fourteenth day of July, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Palmer Ice and Refrigerating Company.— Location of principal place of business, San Francisco, California. Location of Works, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 2), levied upon the Twenty-First day of April, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Certificate.	No Shares	Amt.
C C Palmer	7	200	$1,000 00
Wm E Wood	8	50	250 00
August Hemme	5	100	500 00

And in accordance with law, and an order of the Board of Directors, made on the Twenty-First day of April, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 303 Montgomery street, San Francisco, California, on Thursday, the Seventeenth day of June, 1880, at the hour of one o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

C. C. PALMER, Secretary.

Office—No. 303 Montgomery street, San Francisco, California.

REMOVAL NOTICE.

THE OFFICES OF THE

Ophir Silver Mining Company

— AND —

Mexican Gold and Silver M. Co.

HAVE REMOVED TO

Room No. 16, Nevada Block.

C. L. McCOY,
Secretary.

REMOVAL NOTICE.

The office of the following Companies have removed to

No. 327 Pine Street,

The S. F. Stock Exchange Building, Room 8.

Bolcher Silver Mining Co.,

Manhattan Silver Mining Co.,

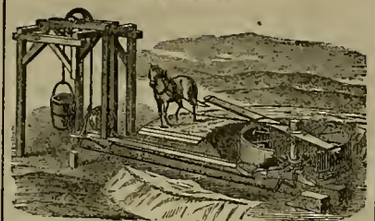
Champion Mining Co.,

New York Mining Co.

INGERSOLL ECLIPSE ROCK DRILLS.

The Best and Cheapest DRILL in the Market.

The Most Economical Air Compressors in the Market.



MINERS' HORSE-POWER.

One Horse can easily hoist over 1,000 pounds at a depth of 500 feet. The Power is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing

REYNOLDS & RIX,
49 Fremont St., S. F.

Improved Grounds For Sale

NEAR SAN JOSE.

The subscriber offers for sale a tract of land, 40 acres in extent, located half a mile south of the road from San Jose to Alum Rock, and four miles from San Jose—directly in the warm belt of the foothills. The grounds are pleasantly and conveniently located, and under a high state of cultivation.

Five Acres in Orchard,

— CONSISTING OF —

Orange, Lemon and Lime Trees, Nuts,

FIGS, ETC.,

Together with a great variety of other Fruits, large and small, and GRAPES. TWO ACRES are set off for an

ORNAMENTAL GARDEN,

Which is now filled with Shrubs, Flowers and a fine growth of ORNAMENTAL TREES. 170 in number, now 11 years old. In connection with these grounds there is now a

Small Cottage and Farm House,

Well built and hard finished. On the higher ground there is a

FISH POND,

40 by 80 ft in extent, and 8 ft deep, well stocked with Carp. The pond is supplied with water from a never-failing spring a few ft distant, which delivers 24,000 gallons of water every 24 hours the year round. The pond is at an elevation of 20 ft above the house, and from it pipes are laid for irrigating the orchard and garden, and supplying the house.

Forty-three acres additional will be sold if desired, making a total of 83 acres.

This place affords a rare opportunity for anyone desirous of securing a well improved locality for an elegant country residence, and will be sold at a great bargain. For further information apply either at this office or of the proprietor on the premises.

C. FIELDSTED.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE ..... Manager.
CHAS. H. GOODWIN ..... Treasurer.
J. P. CHAPMAN ..... Assistant Treasurer.

MISS RACHAEL SANGER.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily

BUSH STREET THEATER.

CHAS. E. LOCKE ..... Lessee and Manager

THE PIRATES OF PENZANCE,

Open every evening and Saturday Matinee.

W. T. GARRATT'S

BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings

Hooker's Patent Celebrated

STEAM PUMP

☞ The Best and Most Durable in use. Also, a variety of other

PUMPS

For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,
For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF

IRON PIPE AND MALLEABLE IRON FITTINGS.

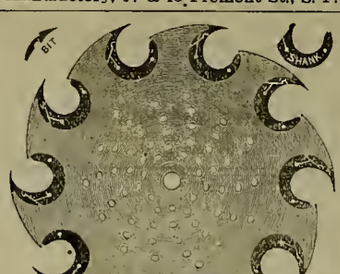
ALL KINDS OF

WORK AND COMPOSITION NAILS,
AT LOWEST RATES.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

Manufactory, 17 & 19 Fremont St., S. F.



Entirely different from other Saws. When dull, sharp teeth, which only cost a trifle, can be inserted in a few minutes, without taking the saw off of the mandrel, and no skill is required in doing it. Send for Catalogue showing their vast superiority. More of them are being sold than of any other kind, and we are altering all other kinds to the Chisel Tooth.

TATUM & BOWEN,

329 Market Street, 3 Fremont Street

Mining Books.

Orders for Mining and Scientific Books in general will be supplied through this office at published rates.

A. S. HALLIDIE.

Office, No. 6 California Street,

SAN FRANCISCO.

Manufacturer and dealer in all kinds of

Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire

Of all sizes on hand or made to order.

Barbed Fence Wire.

Sole Proprietor of

Hallidie's Endless Ropeway,

For the Transportation of Ores, Etc.

☞ Send for a Circular.

A. S. HALLIDIE,
Office, No. 6 California St., San Francisco

EVERY FOOT WARRANTED.

BELTING AND PACKING.

EXTRA QUALITY ENDLESS BELTS.
STEAM AND SUCTION HOSE,
AIR, OIL AND BREWERS' HOSE,
CAR SPRINGS, VALVES, GASKETS, Etc.

All Kinds of Rubber Goods Made to Order at a Few Hours' Notice.

RUBBER FACTORY
ON THE PREMISES.

Goodyear Rubber Co.,

R. H. PEASE, Jr.,
S. M. RUNYON, } Agents.

Nos. 577 and 579 Market St., San Francisco.

SACKETT
BOARDING SCHOOL FOR BOYS.

Fits Boys thoroughly for the

University of California, for College or for Business.

The best instruction is provided by Teachers of Experience and ability.

Location most healthful and home equipment unequalled by any Boys' School in the State.

For Catalogue, address the

Principal, D. P. SACKETT, A. M.
No. 529 Hobart St., Oakland, Cal.

Some fine sunny offices (next to the PRESS office), to rent (at very reasonable rates), by Dewey & Co., at 202 Sansome street, corner of Pine.

PACIFIC MACHINERY DEPOT.

H. P. GREGORY & CO.,

Nos. 2 and 4 California Street, San Francisco.

Importers and Dealers in every description of

MACHINERY!

Sole Agents for the Pacific Coast for

BUCKEYE
Engine Company.

J. A. Fay & Co.'s Wood-Working Machinery; Bement & Sons' Machinists' Tools; Blake Steam Pumps; Knowles Steam Pumps; N. Y. Belting and Packing Co.'s Rubber Goods; Sturtevant Blowers and Exhaust Fan; Tanite Co.'s Emery Wheels and Machinery; Payne's Vertical Engines and Boilers; Perry's Centrifugal Pump; Judson's Standard Governors; Dreyfus Self-Oilers; Gould M'f'g Co.'s Hand and Power Pumps; Eclipse Windmills; Disston & Sons Circular Saws; Otto Silent Gas Engine; Ducs' Elevator Cups; Ballard's Oak Tanned Belting.

Also on hand and for sale A FULL LINE OF MILL AND MINING SUPPLIES.

Iron and Machine Works.

HOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St. (rear of Ætna Foundry),

J. V. HALL,

PRACTICAL BOILER MAKER.

Marine, Stationary and Portable Boilers, Smoke Stacks Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK,

Repairing promptly attended to at the lowest possible terms.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL

Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

SACRAMENTO, CAL.

PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California,

SAN FRANCISCO, CAL.

Golden State & Miners Iron Works,

Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

California Brass Foundry,

No. 125 First Street, Opposite Minna.

SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

J. H. WEEO. V. KINGWELL.

California Machine Works,

WM. H. BIRCH, Prop'r.

119 Beale Street, San Francisco.

☞General Mechanical Engineer and Machinist. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturer of Brodie's Patent Rock Crushers and Steel-Faced Tappits. Agent and Manufacturer of F. A. Youse's Patent Steam Packing Rings for Steam Pistons. The best ever invented; can be applied to any Engine Piston and give entire satisfaction to those using. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

J. HENDY, 49 and 51 Fremont Street, S. F.

THOMAS THOMPSON. THORNTON THOMPSON.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

and 131 Beale St., between Mission and Howard, S. F

MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

GEORGE W. PRESCOTT. IRVING M. SCOTT. H. T. SCOTT.

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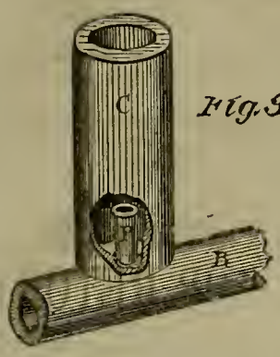

Fig. 3.

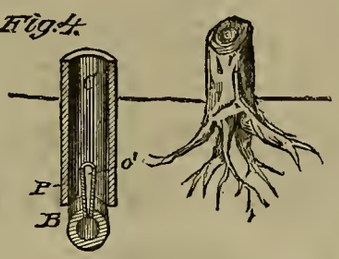

Fig. 4.

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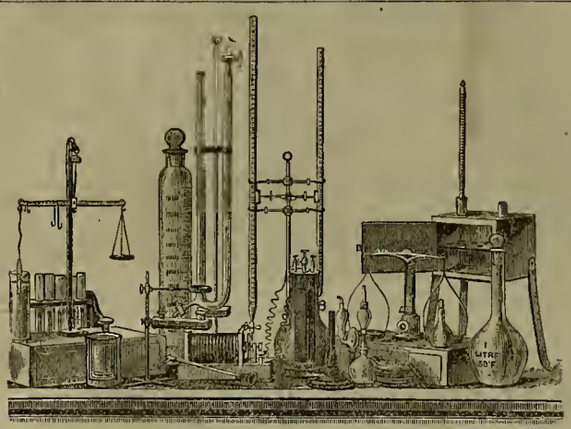

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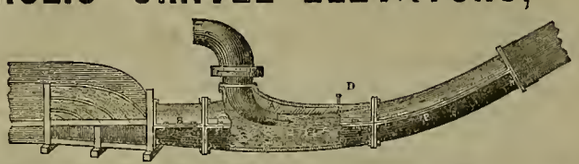

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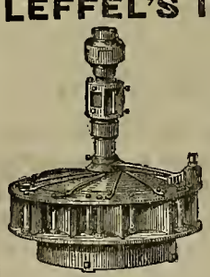

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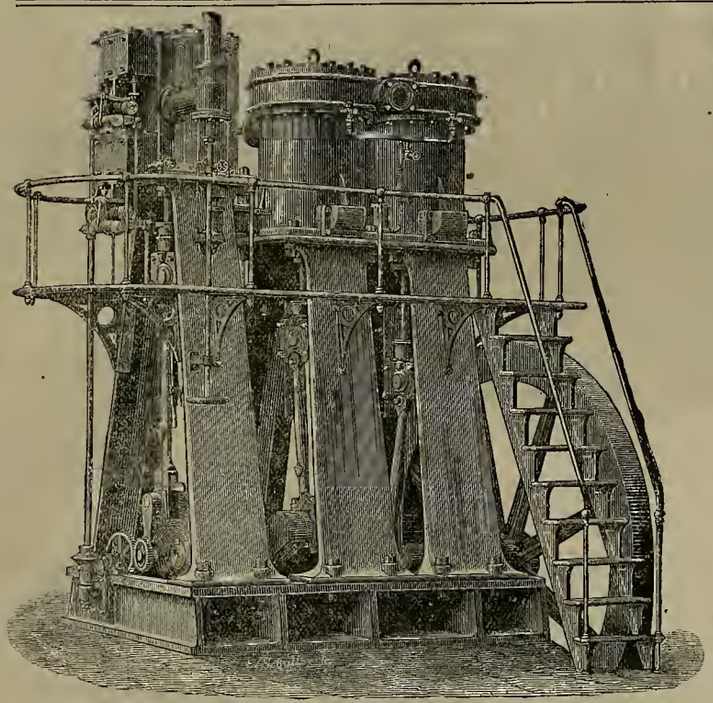

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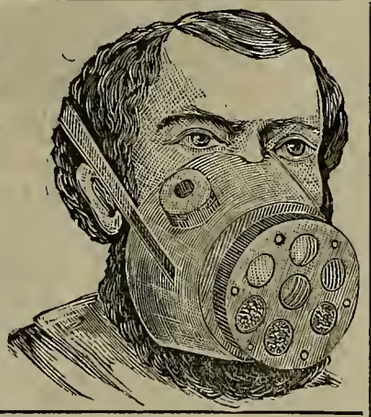

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The Annoying Thumb Screw is Entirely done away with.

We Make Seven Sizes, as follows:

Number or Pints.....	1	2	3	4	5	6	10
Holds Pounds Quicksilver	12½	25	38	50	63	75	125
Weight each.....	10 lbs	15	18	25	31	44	65

Mortars and Pestles,

GROUND INSIDE.

Size—Quarts....	½	1	2	4	6	8	12	16
Hight—Inches..	37	5	6	7½	8½	9	11	12
Weight—Ponnds	6½	9	16	22	37	43	72	86

Bullion Ladle.

Forged from one piece of Charcoal Iron, eight inches in diameter by four inches deep.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JUNE 12, 1880.

VOLUME XL Number 24.

From Evil, Good.

We are not prone to rejoice over other people's ills or in wishing one class of citizens ill that others may profit by their misfortunes. When, however, we are brought face to face with any great evil we endeavor to obtain a view of the bright side, for we believe there is no evil so dark that it has not its relative brightness in a greater or less degree. The winter of 1878-9 was one of the driest ever known in southern California. So little rain fell in the south San Joaquin valley, and the inland region south of it, that the ground at no time became wet enough to start the grain crops or the wild feed. And as it was preceded by a season scarcely more favorable, the past year proved one of great trial to all of those farmers who had not facilities for irrigation. A large majority of them did not raise enough to keep their families and their animals through the year, and work being uncommonly scarce they found it difficult to obtain employment to earn money to live; particularly was this the case in the greater portions of Fresno, Tulare and Kern counties.

About that time a few prospectors had discovered gold-bearing quartz veins in the mountains (Sierra Nevadas), and a number of farmers who had previously worked in the mines, took with them pack horses and pick and shovel and proceeded to the mountains to rehearse the times of the early mining excitements. Having nothing to require their presence at home they felt as if on a forced pleasure excursion, perhaps for profit, perchance to kill time only. As a result the mountains which had scarcely known the stroke of the miner's pick, soon became scarred from base to summit with prospect holes. Many veins of gold quartz were discovered in the foothills, while higher up in the mountains, veins of argentiferous galena that assay well in silver and contain some gold were found. In fact most of California's silver ledges yet discovered are in the higher Sierras of the southern counties.

Every party of men returning from the mountains brought rock to be assayed, which yielded with varied results. Some of the ledges proved to be of no value, but a much larger portion than was anticipated by experienced miners assayed well, and several proved to be first-class ore. Those who had not met with success in their quest for gold returned to their homes in the fall as they had left them. The more fortunate ones who had made "finds" immediately began to develop them. Mining districts were organized, roads and trails constructed to them, and arastras and other appliances built to work the ore on a limited scale. In two or three districts which had been partially developed before, large mills were erected and roads constructed at great expense, giving employment to hundreds of farmers from the valley with their teams for a good part of the summer and fall. The first shipments of gold and silver bullion have already been made from some of these mines, and preparations are under way to open up and work them in a more thorough manner this season.

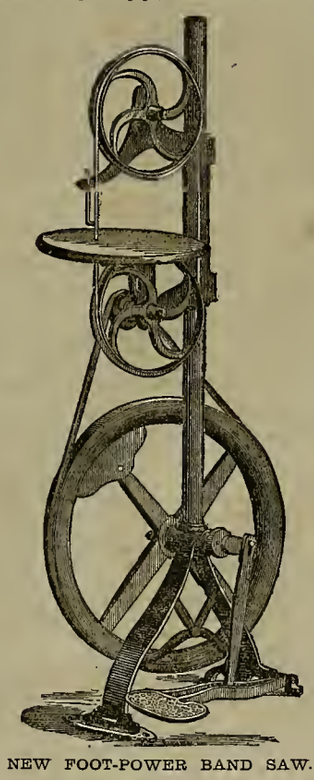
Thus a large extent of mining country that had lain unnoticed for years, and would, perhaps, have remained so for years to come, has been well prospected by farmers—formerly miners—who, in a more prosperous season, could not have been induced to leave their homes. While we sympathize with those who were caused to suffer by drouth last year, it is gratifying to know that some good resulted from it; then an extensive addition was made to our mining area that will contribute its quota to California's annual product of treasure.

COINAGE FOR MAY.—During the month of May the Mint in San Francisco coined 49,000 double-eagles, 62,000 eagles, 98,000 half-eagles, and 800,000 standard dollars—in all, 1,000,000 pieces, of the value of $2,890,000. At Carson, Nev., the amount coined was: Half-eagles, 9,500, value, $47,545; 87,000 standard silver dollars—in all, 96,509 pieces, of the value of $134,545.

A Foot-Power Band Saw.

We saw at Dunham & Carrigan's this week a light running foot-power band sawing machine, the first of this class of machines, we believe, which has been brought to this coast. It is specially adapted for country cabinet-makers, general repairing, etc. It is a practical machine with saw wheels of one ft. two inches in diameter; a small pulley 4½ inches, and fly-wheel two ft. in diameter. It is adapted to cut 4½ inches in thickness of any kind of wood, and weighs 220 pounds boxed.

As will be seen by the accompanying engraving, the table is placed breast high in a convenient position. The feet are screwed to the floor, and from them extends upward a standard formed of 1½-inch pipe, which forms the frame



NEW FOOT-POWER BAND SAW.

for the machine. Out of this standard slides a telescopic pipe adapted to extend upward to the ceiling, to which it is bolted or screwed in order to brace and steady the machine. An assortment of band saws from 1-16 to 1-4 inch come with it. The treadle may be removed, and a pulley substituted for power if desired. As a foot-power band saw, however, this machine will be found very useful and convenient.

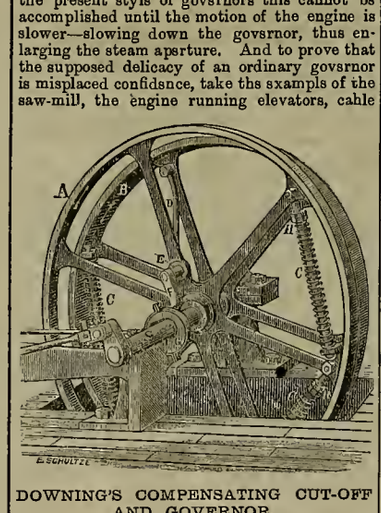
FETID ROCK.—The Park City *Record*, Utah, says that samples of rock from a ledge in Elkhorn, which were brought to its office, emit a most disagreeable odor when struck with any hard substance; and suggests "The Skunk" as a suitable name for the claim. The rock is probably stinkstone, a limestone which gives a fetid odor when struck with a hammer or pick. A variety of quartz, when subjected to friction or a blow, also gives out a fetid odor.

SMELTING AT DARWIN.—A correspondent of the *Inyo Independent*, June 5th, says that ore from the Custer, Vulcan and Promontorio, amounting to 350 tons, was smelted at the Defiance furnace in a 15-day run, yielding 100 tons of bullion of the value of $30,000. The New Coso furnace worked 300 tons of ore from the company's mine, which yielded 63 tons of bullion, valued at $15,000.

Downing's Compensating Cut-off and Regulating Governor.

With the ordinary so-called governors, so long as the work the engine has to do is a constant quantity, and the steam pressure on the piston remains uniform, just so long will the engine keep up a uniform motion; but when either of these factors varies, the speed of the engine will vary. To give an extreme illustration of this (as an extreme case can be better understood), witness the action of a saw-mill engine, or a propeller engine. The engine, in either of these cases, is subject to such sudden changes of duty that none of the present governors or automatic cut-off mechanisms have been applied with a completely satisfactory result. As an engineer on one of our coasting steamers said, in answer to a query regarding the efficiency of a governing appliance on his engine, "It works well enough in ordinary weather, but when the sea is rough we have to disconnect it and stand by the throttle all the time."

The reason the present regulators are insufficient is obvious if we but examine them for their principle. They depend upon the centrifugal force they acquire for action, and get their generating motion *from the motion of the engine.* Now, if more work is suddenly required of an engine, a greater volume of steam must just as suddenly be admitted to the cylinder. With the present style of governors this cannot be accomplished until the motion of the engine is slower—slowing down the governor, thus enlarging the steam aperture. And to prove that the supposed delicacy of an ordinary governor is misplaced confidence, take the example of the saw-mill, the engine running elevators, cable



DOWNING'S COMPENSATING CUT-OFF AND GOVERNOR.

roads, propeller engines, and any number of other instances which the interested can find.

In the case of the saw-mill, the engine may be running at 70 revolutions per minute; suddenly the log engages the saw, and more steam is required. Will the governor let the engine have it? Well, it will when the engine has slowed down to say 45 revolutions or less, so as to run the governor slower. In other words, when the duty of the engine and the volume of steam to do it have struck a compromise at half the piston speed.

In the case of the propeller engine, running at 90 revolutions, the motion of a rough sea, with considerable celerity, carries the stern of a steamer high in the air, and with it the propeller to the surface of the water, when an immediate racing of the engines ensues, to the imminent danger of the engines and ship's timbers. Does the present regulator shut off the steam supply? Not until a compromise is found at double the speed.

Mr. C. V. B. Downing, of 320 Sansome St., in this city, has, to overcome these objections, devised a regulating mechanism, actuated by the change of duty required of the engine, and governed by the laws of compensation, and this he has recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency. The details of the mechanism are shown in the accompanying engraving.

A represents the fly-wheel keyed to the crank-shaft, *S*, as usual. *B* represents the driving pulley (band wheel), or gear wheel, as the case may be, which is, in this improvement, loose upon the shaft, *S*, and driven by the springs, *CCC;* these springs are free to traverse the rods, one end of which is fixed to an arm of the fly-wheel, carrying jam nuts at *HH*—used to give the springs the proper tension. One arm of the fly-wheel carries the short wrist-shaft, *E*, to which are keyed the lever, *D*, and the eccentric-arm, *F*. *G* is the eccentric, having a slot to allow a full movement across the shaft, *S*, without touching it, and so positioned as to give the same lead to the valve at any throw of the eccentric. The action of the mechanism is as follows:

The motion of the engine is "over"—in the direction of the arrow at *A* on the fly-wheel. Supposing the engine to be driving machinery by a belt on the pulley, *B*, the resistance will be in the direction of the arrow on the pulley-rim at *B;* the lugs on the arm of the pulley will drive the springs back, compressing them (since the other ends of the springs are rigid) in proportion to the load or resistance to be overcome. As this movement takes place, changing the relative positions of the fly-wheel and pulley, the outer end of the radial lever, *D*, is carried backward, throwing the inner end and eccentric forward, the eccentric then has a great throw, as the duty of the engine increases, carrying the valve of the engine with it.

By this it will be seen the resistance opposing the engine's motion is actually and accurately weighed in the same manner that any commodity is weighed in a "spring balance." And whereas, the best of the present cut-offs will not complete their action in an opening or closing movement short of three or four whole revolutions of the engine, this one will go from one extreme to the other in one-sixteenth of one revolution. And since not more than one-quarter of this movement will ordinarily be required, it is plain that its action is practically instantaneous.

By applying a pointer, the fulcrum pivot on one wheel, and the outer end carried by the other wheel, the point of which traverses an index segment at the hub of the wheel near the shaft, we have an accurate indicator, which may be consulted at any moment to find the horse power exerted, and show the engineer when an excess of friction from dry boxes, or otherwise, is using up more fuel than is necessary.

A model showing the valve movement can be seen in the engine room at Halleck block, 320 Sansome St., and a complete working model is in process of construction at the Golden State & Miners' Iron Works.

RAILROAD LEASES.—It has been supposed that a railroad company had the legal right to lease or sell its line at will; but the Supreme Court of the United States has decided that, in the absence of express authority in its charter, a railroad company has no right to transfer its road and franchises to other parties, and thus render itself unable to perform the duties which its charter, either directly or by implication, imposed. The court held that a railroad company's franchise is intended to be exercised for the public good; that the due performance of this function is the consideration for the grant; and that a contract which undertakes, without the consent of the State, to transfer to others the rights and powers conferred by the charter and relieve the grantees of the burden which it imposes, is a violation of the contract, and is void as being against public policy. The *Economist* says, considering that there are between 400 and 500 railroads in the United States, representing nearly one-fourth of the entire railroad mileage of the country, at present being operated under a lease, it will be seen that this decision of the Supreme Court is an important one, and one which promises to unsettle a large majority of the railroad leases in the country, since very few railroads, when chartered, contemplated the probability of their being leased, and consequently made no provision for such a contingency in their charter.

THE dental authorities estimate that the 12,000 dentists in this country are every year packing into the teeth of the people not less than half a ton of pure gold, costing half a million dollars.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Iron Ore in San Luis Obispo County.

EDITORS PRESS:—Having read with considerable interest that iron ore has lately been attracting a great deal of attention, not only among prospectors, but likewise capitalists, who, beginning to see the vast importance of this valuable and useful metal, have freely advanced money to further an enterprise that may in a short time eclipse in wealth the gold and silver interest of the Pacific coast, I see in your last issue that the pioneer iron blast furnace is in course of construction at Glipper Gap. This shows that the entering wedge in this direction has been started, and may he the forerunner of a like enterprise nearer home. In the county of San Luis Obispo, up to the present date, chrome iron has been the most sought after; but within the last three months the vast amount of iron ore scattered throughout the county has awakened the residents to a realization of the material wealth that would be added to this county if a step would be taken in the right direction to utilize this new resource.

Within three miles of the city of San Luis Obispo is a body of ore that would supply an inexhaustible quantity of hematite ore. The ledge is in plain sight for miles. The croppings alone, of which seven tons were sent to San Francisco to the Benchley Works for reduction, showed a percentage of 82% iron. The location is in every respect admirable for the purposes of reduction—timber for fuel in abundance and a never-failing stream of water—the distance to tide water being seven miles. Two asphaltum mines, which would produce an endless supply of material, are within 6 to 15 miles of the ledge. By this it will be seen that if in proper hands with capital to develop this enterprise, that it would be a source of profit to the parties interested, as well as a benefit to the State.

San Luis Obispo, June 1, '80. D. H.

Mechanics' Institute.

Fifteenth Industrial Exhibition

Rules respecting the reception of goods, and for determining the awards of premiums, gold, silver and bronze medals, special premiums for California.

Board of Managers.

P. B. Cornwall, Pres.; A. W. Starbird, Vice-Pres.; J. A. Bauer, Treas.; J. H. Culver, Sec'y; J. H. Gilmore, Supt.; and A. L. Fish, C. Waterhouse, James Drury, Nathaniel Hunter, F. A. Frank, David Kerr, Samuel Dinsmore, J. R. Wilcox, George H. Hopps, Edwin Fretwell and George Spaulding.

Standing Committees

For the exhibition are: Auditing—Waterhouse, Frank, Kerr; Building—Drury, Wilcox, Starbird; Circulare and Classifications—Fretwell, Bauer, Hunter; Printing and Advertising—Spaulding, Hunter, Hopps; Power and Machinery—Dinsmore, Fish, Wilcox; Rules, Regulations and Awards—Frank, Fretwell, Bauer; Tickets and Admission—Starbird, Kerr, Fretwell; Music and Decorations—Bauer, Starbird, Hopps; Privileges—Kerr, Starbird, Frank; Location—Dinsmore, Hunter, Fish; Police—Hunter, Spaulding, Hopps; Horticulture—Fish, Waterhouse, Spaulding; Gas and Water—Wilcox, Drury, Dinsmore; Art—Hopps, Waterhouse, Drury.

Reception of Goods—Rules.

The pavilion will be open for the reception of goods from and after Monday, July 26th, and the exhibition will open Tuesday, Aug. 10th, and continue, Sundays excepted, from 10 A. M. to 10 P. M., until Sept. 11th. Articles may be entered for either exhibition or competition; if the latter, they must be in position not later than Aug. 13th. Application for space must be made at least two weeks before the opening. The managers will exercise the utmost care in protecting goods, but all articles deposited will be at the owner's risk. The Board will select three jurors for each class of articles. All premiume will be for the first degree of merit only. No second-class awards or decisions will be made or reported in any cases unless otherwise specified in the premium list.

The Premium List

Comprises the following divisions: I. Manufactured produce—machinery. II. Manufactured products—metals. III. Manufactured products—wood, or wood and iron. IV. Manufactured products—animal and vegetable fabrics. V. Chemical and natural products. VI. Food products. VII. Liberal and decorative art. VIII. Fine arts. IX. Horticulture.

The divisions are subdivided into 47 classes, as follows: 1. Steam engines, boilers and appliances—1 gold medal, 5 silver medals, 6 bronze medals, and 5 diplomas. 2. Hydraulic machinery and steam pumps—1 gold medal, 6 silver medals, 4 bronze medals, and 1 diploma. 3. Machinists' tools and metal-working machinery—5 silver medals, 10 bronze medals, and 6 diplomas. 4. Wood-working machinery—1 gold medal, 9 silver medals, 13 bronze medals, and 5 diplomas. 5. Printing and miscellaneous machinery—1 gold medal, 8 silver medals, 7 bronze medals, and 2 diplomas. 6. Mining machinery and appliances—1 gold medal, 10 silver medals, and 3 bronze medals. 7. Laundry machinery—1 silver medal, 3 bronze medals, and 2 diplomas. 8. Fire apparatus and appliances—1 gold medal, 4 silver medals, 1 bronze medal, and 2 diplomas. 9. Marine—4 silver medals, 7 bronze medals, and 1 diploma. 10. Sewing machines, knitting machines, braiding machines and looms—3 gold medals, 6 silver medals, and 3 bronze medals. 11. Agricultural machinery—1 gold medal, 7 silver medals, 20 bronze medals, and 8 diplomas. 12. Iron, steel and lead—4 gold medals, 7 silver medals, 5 bronze medals, and 2 diplomas. 13. Cooking, heating and ventilating—6 silver medals, 1 bronze medal, and 1 diploma. 14. General hardware—1 gold medal, 2 silver medals, 6 bronze medals, and 1 diploma. 15. Fire and burglar-proof safes and locks—1 gold medal and 2 silver medals. 16. Cutlery and edge tools—1 gold medal and 2 silver medals. 17. Grates and mantels, marbles, artificial stone, earthenware, glassware, etc.—1 gold medal, 8 silver medals, 5 bronze medals, and 2 diplomas. 18. Brass work, gas and lamp fixtures, plumbers' good, etc.—1 gold medal, 9 silver medals, and 5 bronze medale. 19. Carpenters', joiners', carvers' and stair-builders' work, ornamental glass painting, etc.—2 gold medals, 7 silver medals. 10 bronze medals and three diplomas. 20. Musical instruments—1 gold medal and 4 silver medals. 21. Vehicles and their attachments, children's carriages, bobbyhorses, etc.—1 gold medal, 16 silver medals and 6 bronze medals. 22. Furniture, upholstery, etc.—1 gold medal, 12 silver medals and 5 bronze medals. 23. Billiard tables.—1 gold medal, 2 silver and 2 bronze medals. 24. Woodenware, brushes, wire goods, willowware, etc.—1 gold medal, 6 silver medals and 3 bronze medals. 25. Boots, shoes, leather, rubber goods, etc.—2 gold medals, 15 silver medals and 5 bronze medals. 26. Hemp, cordage, paper, fure, hair, etc.—2 gold medals, 7 silver medals, 5 bronze medals and 1 diploma. 27. Woolens, dress goods, carpets, cotton, etc.—1 gold medal and 15 silver medals. 28. Gentlemen's furnishing goods, etc.—7 silver medals and 5 bronze medals. 29. Ladies' furnishing goods, dresses, cloaks, millinery, etc.—7 silver medals, 6 bronze medals and 1 diploma.

30. Tobacco—2 silver medals and 3 bronze medals. 31. Chemical and pharmaceutical products—3 gold medals, 14 silver medals, 6 bronze medals and 3 diplomas. 32. Geology, mineralogy, zoology, botany, etc.—2 gold medals, 8 silver medals, 2 bronze medals and 2 diplomas. 33. Groceries, meats, flour, etc.—14 silver medals, 9 bronze medals and 1 diploma. 34. Wines—1 gold medal and 8 silver medals. 35. Liquors and fermented products—4 silver medals and 1 bronze medal. 36. Printing and lithographing, etc.—10 silver medals and 5 bronze medals. 37. Gold, silver and plated ware, watches, clocks, jewelry, bronzes, etc.—1 gold medal, 6 silver medals and 6 bronze medals. 38. Scientific apparatus, etc.—1 gold medal, 8 silver medals and 12 bronze medals. 39. Surgical and dental instruments and appliances—3 silver medals, 3 bronze medals and 1 diploma. 40. Hairwork, needlework, embroidery, shellwork, patterns, etc.—3 silver medals, 4 bronze medals and 41 diplomas.

41. Paintings in oil and water colors—$10 in each will be awarded in this class for the most meritorious exhibits by local artists. The classification of awards is not yet determined upon. 42. Ceramic art—7 silver medals and six bronze medals. 43. Sculpture statuary and carving—8 silver medals. 44. Engravings, original drawings, penmanship, etc.—13 silver medals and 1 diploma. 45. Photography—1 gold medal, 4 silver medals and 5 bronze medals. 46. Plants, trees and flowers—5 silver medals, 9 bronze medals and four diplomas. 47. Fruit—4 silver medals and 8 bronze medals.

In all, there are 648 prizes, besides $1,000 cash, to be distributed among local artists in oil and water colors, as may be determined hereafter; but the managers do not consider the list complete, and any meritorious article on exhibition, not therein mentioned, will receive due consideration.

California Premiums.

Premiums will be awarded for the best display in California make to the following: File cutlery, fire arms, assortment locks, assortment of edge tools, glassware, sample of galvanizing, and sample of electro-plating (done in San Francisco), articles made from California wood, turned articles from California wood, plate-glass mirror, string or reed instruments, backs, single top buggy, open buggy, hotel coach, double buggy, sulky, stage coach, brooms, general display of boots and shoes, ladies' and misses' hand-made shoes, men's hand-made shoes, machine-made boots and shoes, sole leather, fair leather, kid leather, morocco leather, calf skins, leather belting, rawhide goods, leather hose (100 ft.), lasts, bale of hemp, imitation hair, cordage, paper, paper rags, paper boxes, dress silks (25 yards), ribbons (10 varieties), manufactured silk, thread and twist, woolen goods, mats and matting, oil cloth, weaving, gentlemen's furnishing goods, umbrellas and parasols, gloves (goat or buckskin, and kid), ladies' corsets, buttone and fringes, cigare, cigarettes, finecut tobacco, acids, candles, glue, shoe-blacking, writing fluid and mucilage, matches (quality and variety), coals (Pacific coast), fossils (ditto), petroleum, crude and refined, largest and most comprehensive collection of natural products of the Pacific coast, refined sugar, butter and cheese, hams, bacon and lard, codfish (cured), best general display of wines, best of sparkling, still, dry, white, sweet, port and claret wines, and cider, grape brandy, printed sheet music (done here), solid silverware, watch or clock, show cases, surveyors' instruments, hand-made lace work, specimen painting on pottery, painting on porcelain, wood engraving, mechanical drawing by a pupil of the public schools, architectural drawings, generally by pupils of public and private schools of this city, landscape photography, raisins, etc.

A Wonderful Copper Region.

We have before us a number of specimens of ore from the copper mine recently purchased by D. H. Jackson in the Walker River region. Among these are blue and green carbonates, sulphurets, native bluestone, some native copper, and indeed copper in almost every form in which it is ever seen. When purchased by Mr. J. the mine was known as the "Bluestone copper mine." The owner, a Walker River ranchman, had for some years been engaged in digging out the ore and sending it by wagon to Dayton, where it was sold to the company engaged at that place in the manufacture of bluestone.

There is a whole mountain of ore, and much of that taken to Dayton was dug from a pits sunk at various points. When a pit became so deep that the ore could no longer be conveniently shoveled out it was abandoned and work commenced in a new place. In this way a number of holes have been sunk for a distance of about 1,500 ft. east and west and about 1,000 north and south.

While the whole surface of the mountain seems to be covered with ore, a close examination shows the appearance of two great veins, one running north and south and the other east and west. Where the ledges cross each other all is a mass of ore for a great distance in every direction.

The only approach to regular mining made by the former owner of the mine was at this point where the veins appear to cross. Here a tunnel has been run for a distance of about 50 ft., from the end of which ore has been dug out in all directions, columns being left to support the roof. The place is said to look more like a great cavern than a mine. The columns left are from three to six and eight ft. in diameter, and Mr. J. says a four-horse team might be driven in among them. This cavern is so dry and so well ventilated that several of the miners sleep in it. It answers very well as a sleeping place if no dust is kicked up. The dust is bad and when inhaled it excites coughing.

Native Bluestone.

A wonderful feature of this mine is the vein of native bluestone found in it. Some years ago, when the mine was first discovered, very few persons could be made to believe in the native bluestone. When shown specimens of the article most experts pronounced them bogus. They declared that bluestone (sulphate of copper) was a manufactured article, and men might with as much reason come in from the wilds and assert that they had discovered an indigo mine.

However, the native bluestone is no myth and is there in abundance. It lies in a horizontal bed or stratum from 10 to 12 feet in thickness, and forms the roof of the tunnel mentioned above. Much of it is just as bright and pure as the manufactured article, but the great mass has little seams of clay running through it. At one time the owners of the mine broke down and picked out several tons of the pure article, but when they hauled it to Dayton the price allowed them was less than they thought they should have received; therefore they mined no more of it, and several hundred pounds left on the ground is still there, but bleached out till quite white.

To refine this native bluestone would be a very easy matter. It would only be necessary to dissolve it in a large tank, when the clay and other foreign matter would sink and the solution of copper could be drawn off and recrystallized, or it might be precipitated, and at once changed into metallic copper.

Present Operations.

Mr. J. has some 10 men at work at the mine and has been sinking a shaft that was started by the former owner. This shaft is down 100 ft., and crosscuts are being run to define the vein and learn something about its width. At and near the surface the ore is from 15% to 40% copper, but at the depth of 100 ft. it averages over 50%.

A Mass of the Metal.

There is a rude old furnace near the mine, and during his recent visit Mr. J. fired up on this and smelted a lot of the carbonate ore, allowing the metal to run out and form a mass on the ground. This mass is some four ft. long, over three ft. wide and about a foot thick. Mr. J. has no idea how much it will weigh. He arranged with a teamster to haul it into this city en masse, but the teamster wrote that he was having trouble with the lump. He managed to get it upon his wagon, after much trouble, but it broke the wagon down. The man with this copper elephant on his hands wrote to know if Mr. J. would not allow him to cut it. Samples cut from corners of this mass, now on exhibition in this city, appear to be as pure as any of the copper of commerce.

Mr. J.'s mine is only about two miles from Walker river, and on the river he has secured a piece of ground on which to put up furnaces, there being an abundance of water-power for running all kinds of machinery.

The Ludwig Mine.

The Ludwig mine, a few miles from the Jackson mine, is another wonderful mineral deposit. The vein is an immense one, and it not only produces copper, but is also rich in cobalt and nickel. At this mine there are now piled up on the dump from 4,000 to 5,000 tons of copper ore of the richest character. The owner of the mine has been for some years, off and on, hauling this ore to the bluestone works at Dayton. In all he has received for ore delivered at said works a little over $120,000. This was at just such prices as the owner of the bluestone works saw fit to pay for the ore, as there was no other place to which it could be taken for sale.

The ores of cobalt and nickel are found in strata next to the footwall, and can be separated from the copper ore without trouble. They have piled up at the mine several tons of cobalt and nickel ores. These ores came out in taking out the copper ore, and there being no demand for them they were thrown aside for "future reference," and they still lie uncalled for.

In this Ludwig mine there is a great deal of native copper—much more than is seen in the Jackson mine. The owner is a ranchman, and the mining that has been done is of the same kind seen at the Jackson. We have before us a beautiful specimen from the Ludwig mine. On one side is a layer of the cobalt ore, on the other a slab of green carbonate and in the center a ribbon half an inch in width of pure, bright blue carbonate.

Other Mines

Of copper similar to those described to the number of about a dozen are found in the immediate neighborhood. A little work has been done on some of them by the ranchmen living in the vicinity, while on others there is to be seen hardly the scratch of a pick. It appears that for some years the owners of the ranches out along the valley of the Walker river have been in the habit of going to the mines when they stood in need of a little ready money. All they had to do was to dig the ore, load it upon their wagons and haul it to the bluestone manufactory, when their coin was won.

The new railroad to Candelaria will pass through the heart of this copper region—it will go within seven miles of the Jackson mine—and Mr. Jackson is of the opinion that it would be a good speculation for some capitalist to put up first-class reduction works at some central point on Walker river for working copper and all other kinds of ore, there being mines that are quite rich in gold and silver.—*Territorial Enterprise.*

Empire District, Arizona.

This much-talked-of district is located southeast of Tucson about 25 miles in a straight line, and by road; it embraces that scope of country lying between Davidson's canyon and the Whetstone mountains, and can be reached from the Cienega station, in a direct line within six miles, and by the road which leads to Patagonia, within ten miles. The southeastern portion of the district is bounded by the Cienega valley, which flows a large and constant supply of water. The most attractive feature is the large mineral veins which traverse the district, the showing of which is, without question, the most wonderful of any yet discovered in the Territory. The formation is porphyry and lime. Most of the veins thus far developed show iron and lime cappings, intermingled with chlorides. As depth was reached a fine showing of horn silver has been made.

The Total Wreck and Justice mines are the best developed in the district; both show up large bodies of rich ore.

The Ophir presents a good appearance, as also do a number of other claims in that neighborhood. It is in the Empire district that some of the oleaginous capitalists have staked out bonanzas, prominent among which are the rich finds of Captain Weeks, including 13 mines.

The surface showing of the New York, Yorkville, Chancellor, Black Hawk and Nigger Ben mines are very large,—in fact larger and richer than anything we have seen or heard of in the many interesting discoveries made during the last two years. The New York has four distinct parallel ledges, the croppings of which run from six to eight feet in width. A shaft 12 feet deep on ore of three veins shows a solid ore-body from the top to the bottom. The ore is chloride, with a considerable scattering of horn silver. This shaft is sunk on the summit of the New York hill, which is more than a 1,000 ft. above the surrounding country, on a ledge which runs along its crest. The Yorkville, an extension of the New York, is of the same character, with two shafts. The Chancellor is a parallel claim with the Yorkville, and has bold croppings, the average richness of which is high. The Black Hawk is a mine of mammoth veins, and looks like a mountain of ore. The Nigger Ben is the south extension of the Black Hawk, and bears the same character in its surface showing. The remainder of the group all show up grandly. The average richness of the different kinds of ore taken from all these claims runs from $131 to $1,030 in silver, some showing gold in paying quantities. Taking into consideration the amount of ore in sight, it is safe to predict that Empire district, within a very few months, must, without question, be a great bullion-producing center. Its close proximity to the railroad, water being found in abundance all through the district, and the milling facilities excellent, ensure this. Tombstone two years ago made no such a showing as the Empire does to-day.—*Arizona Star.*

MECHANICAL PROGRESS.

Steel Making in China.

In the manufacture and use of steel, as in other symbols and aspects of civilization, the Chinese appear to have attained a very early and remarkable proficiency. Mr. Jeans, in his recent work on steel, says that unfortunately Chinese records do not enlighten us as to the precise period at which the art of reducing metals from their ores became known in that country, but it is evident that it must have been some centuries before the Christian era. It is not, indeed, unreasonable to conclude that this knowledge was at any rate concurrent with, if not antecedent to, the discovery of the attractive power of the loadstone, which seems to have been used by the Chinese in the reign of the Emperor Hoangti, about 2600 B. C. Mention made of steel in the most ancient of the Chinese writings, and Leih-tze, an author who flourished about 400 B. C., describes the process by which it was made. In the Yu Kung section of the Shoo King, Book I., it is stated, that among the articles forming the tribute of Yu., were nautical gem stones, iron, silver, steel, stones for arrow heads, etc. Legge points out the difference of soft iron, and hard iron or steel, as distinguished by the Chinese, and remarks that in the time of the Han dynasty, ironmasters were appointed in several districts of the old Leangchou to superintend the iron works. With the exception of this passage, however, it is considered probable that there is no distinct allusion to iron in Chinese writings older that 1000 B. C. In describing the manufacture of steel in China, the Pi-tan, or Pencil-Talk, states that wrought iron is heat or twisted up, and unwrought iron is thrown into it. It is then covered up with mud and subjected to the action of fire, and afterward to the hammer. On this passage, Day remarks that it comes remarkably near describing the process of immersing wrought iron either into molten cast iron, or heating it with iron ore and fuel covered over with layers of mud or clay, to exclude, as much as possible, the oxidizing influence of the external atmosphere. At a subsequent period the Chinese records describe the different kinds of steel produced. That obtained by the first process they call ball steel, *Twan Kang* (from its rounded form), or sprinkled steel, *Kwan Kang* (from the pouring of water). Another kind is spoken of as "false steel," "wei tee," and it is quaintly added that "iron has steel within it, as meal contains vermicelli." In the "Peut Saow" (a work of the Ming dynasty), again, three kinds of steel are described, thus: "1. That which is produced by the adding of unwrought to wrought iron while the mass is subject to the action of fire. 2. Pure iron many times subjected to fire produces steel. 3. Native steel, produced in the southwest, at Hai Shau, and which is like in appearance to the stone called *Tsze-shit-ying*—purple stone efflorescence." Steel continues to be manufactured in China to the present day. James Henderson, a commissioner of Li-hung-chang, the Governor-General of Chilili, and minister of the young King of China, states that "the steel which comes to Tien-tzin from the upper Yangtsee is highly prized, and bears much higher prices than the Swedish steel imported into China.

HARDENING AND TESTING.—To really test the hardness of the surface of metal, we must take a new or at least a good, dead smooth file and apply one corner of it to a corner rather than on a flat surface of the metal to be tested, pressing the file very firmly against the work. A coarse file, even if a new one, is useless to test with. The greatest degree of hardness is obtained by plunging the red-hot steel into mercury. Steel hardened from the surface inward is hardest on the surface, while in steel that has been tempered the exterior is the softest. In the one case because the surface was cooled in advance, in the other because it was heated in advance. Files are hardened in the following mixture: 2 parts (by weight) of salt, 15 parts of rye grist, and 30 parts of burnt cow hoofs, all ground together and mixed with a sufficient quantity of water to make a pasty mass, with which the files are covered. When dry, they are placed in a fire. If, during the heating, the coating should drop off at certain places, the files are promptly withdrawn and the place exposed is covered with dry hoof powder. It is returned to the fire, where it is left until a temperature is reached which best suits the steel of which it is made. Then the file is plunged vertically into the bath, care being taken not to move them to the right or left, as that would cause warping. The bath is made in the following manner: 28 parts of salt are dissolved in about 5 parts of water, to which a handful of iron scale is added. The tongs are softened by being plunged into red-hot lead.

RULE for finding the weight necessary to put on a shaft valve lever, when the area of valve, pressure, etc., are known: Multiply the area of the valve by the pressure in pounds per square inch; multiply this product by the distance of the valve from the fulcrum; multiply the weight of the lever by one-half its length; then multiply the weight of the valve and stem by their distance from the fulcrum; add these last two products together, subtract their sum from the first product, and divide the remainder by the length of the lever, the quotient will be the *weight* required.

The Ultimate Applications of Steel.

The more the subject of the manufacture and uses of steel is inquired into, the more does it seem incapable of exhaustion. Great things have been accomplished in the past, but much yet remains in the future. The manufacture of steel is far from finality. Even now some of the leading steel works in France are essaying the production of ingots of 100 tons weight. Steel, indeed, may be compared, in reference to its multifarious uses, with the elephant's trunk, the adaptability of which enables it with equal ease to pick up a needle or to pull up a tree. High authorities have expressed the opinion that steel will have the future nearly altogether to itself, displacing copper for fire-boxes, etc., silver for articles of ornament, and lead for purposes of softness, as much as it is superseding iron in respect of utility, economy and endurance. And as it is difficult to set bounds to the ultimate applications of steel, so it is impossible to limit the means of its production. Recent metallurgical progress has indefinitely increased the resources available for the latter purpose. Science has at last found a method of ridding of their deleterious contents the ores of iron heretofore unsuited for the manufacture of steel, and henceforth, if metallurgists of experience are not greatly deceiving themselves, the cheapest and most plentiful ores will, by one of the greatest chemical triumphs of the age, be raised to the same rank as the richer, and comparatively limited ores that have alone been deemed fit for the steel manufacture until now. The horizon of the future, therefore, is not bounded by any limitation of the supplies of raw material. Nor is it any more likely to be measured by the uses of steel, for they are multiplying every day, and as the manufacture is cheapened and improved, so will the applications continue to increase. In the track of this movement many changes must follow, and have even already occurred, of which we have been able to take but scant cognizance. The hard and irksome work of the puddler has been superseded by less arduous and, in the main, by less skilled labor. One of our greatest authorities has calculated that to convert fluid cast iron into steel, the labor required is only about one-third of that required to convert pig metal into wrought iron, while the fuel consumed is only about one-fourth of that formerly used. The economy of coal is, therefore, another important corollary of the advance of steel, and this economy, great though it be in the aggregate, is trifling in comparison with that accomplished through the greater strength and endurance of that which we are fully justified in describing as the metal of the future.—*J. S. Jeans, Secretary of Iron and Steel Institute.*

SELECTING TOOL STEEL.—Hardness, tenacity, facility of working under the hammer, and of receiving temper, are requisites of good tool steel. The presence or absence of some of these qualities cannot be ascertained except by actual experiment; yet good judgment will enable a man to ascertain, with an approach to accuracy, the quality of steel without subjecting it to the action of fire and water and the hammer. Pure iron contains no carbon, but tool steel contains from 1% to 2%. So small is this amount, that it is not surprising that it requires judgment and experience to select steel in the bar. One of the tests is to apply a drop of nitric acid to the surface of a fresh fracture. It will leave a black stain on good steel, but not on iron or low steel. Another test is to observe the color and texture of a freshly made fracture. This should present a fine grain, with a dull silvery luster, and of uniform color. Poor steel may show a close grain, but it will be mottled in color. But the only sure test is in working the steel. Draw the end of the bar, heated to a cherry red, under the hammer, to a fine point. If it will admit of being so pointed, that is a good indication. Plunge it into the hardening bath while hot; and, when chilled, give it a few gentle blows with the hammer. If it is tough and does not fly, but requires some hammering and bending back and forth to break it, that is another good indication. If the fracture shows a fine, even, lively grain, the test is complete, and the workman may be satisfied. One of the best of tests is to make and temper a cold chisel from the bar. If it stands well the chipping on a casting, the steel will make good turning tools. But, after all, the good judgment of the experienced forger is worth more than empirical tests.

INTERNAL EFFECT OF HAMMERING METALS.—If an iron bar be held in the line of the dip of the magnetic needle, and struck upon the upper end with an ordinary hammer, it will become polarized, one end repelling, the other end attracting the magnetic needle. Reverse the bar, and strike it on the opposite end as many blows as before were given, and both ends will attract the magnet. Give two or three more blows, and the bar shows magnetic effects the reverse of those first obtained. Something, therefore, has occurred in the bar due to hammer impact, and the recognition of this makes it in a measure apparent why the compass needle in iron ships may be affected in consequence of the tremor to which the vessel is subjected owing to blows of the waves.—*Appleton's Cyclopedia.*

RAILWAY SLEEPERS.—The Belgian Government is reported to have decided upon the abandonment of wooden railway sleepers, and the adoption, instead, of those of iron, an example which it is thought will be largely imitated.

SCIENTIFIC PROGRESS.

Preservation of Iron Against Rust.

We have repeatedly called the attention of our readers to various systems which have been devised for the preservation of iron against rust. According to *Engineer*, Mr. George Bower, of St. Neots, appears to have made this matter a subject of pretty thorough study and experiment, with the following results: It seems that Mr. Bower has found that the magnetic oxide which, being proof against atmospheric influence, is sought to be produced on iron surfaces for their protection against rust, is really a secondary product. The sesquioxide of iron, a lower oxide, is first produced, and this is subsequently converted into the magnetic oxide. According to the *Engineer*, the process is extremely simple. An oven is constructed large enough to contain, say, a ton of the articles to be coated. In connection with this oven is a gas producer, somewhat similar to that of the Siemens. Any required quantity of air can be admitted (the air being previously heated to a high temperature) to the oven, which accordingly can be filled either with carbonic oxide from the gas producer or with carbonic acid, or with carbonic acid and an excess of oxygen, at pleasure. After the articles have been placed in the furnace, air mixed with carbonic oxide is freely admitted for some time, the carbonic oxide taking up another atom of oxygen from the air and becoming carbonic acid with evolution of heat. The excess of air in the furnace or oven supplies oxygen to the iron, which becomes coated with sesquioxide of iron. After a time the supply of air is shut off. The carbonic oxide then apparently abstracts oxygen from the iron, and the sesquioxide becomes magnetic oxide.

Curiously enough, and for some unexplained reason, the most uniform results are obtained, not, as might be supposed, by first establishing a coating of red oxide of the required thickness and then converting it all at once, but by admitting and shutting off air alternately at regular intervals throughout the process, which lasts from 8 to 10 hours. The consumption of coal is about 5 cwt. per ton of small castings coated. No skilled labor is required, as even if too much air is admitted no harm is done. The only duty devolving on the attendant is to fill the oven, to lute up the door, to attend to the gas producer and to move a handle between two fixed points half a dozen times in the 10 hours. Any handy furnaceman could learn how to work the process in two days. The construction of the oven and the gas producers is said to present some ingenious features of detail essential to the successful operation of the process, which, it is claimed, yields uniform results. The color of the oxide resembles that of lead, and, judging from earlier specimens which have reached this country, it does not appear to us sufficiently effective to be admissible for most purposes without a coat of paint.

FOSSIL BUTTER.—At a late scientific meeting in London, Prof. Church read a paper on a sample of butter, which must have lain for many centuries, buried in an Irish bog. Its probable age was judged to be about one thousand years. The sample contained nearly four per cent. of curd, which consisted partly of vegetable matter derived from the bog, but contained quite enough animal matter to prove that the butter had been originally made from animal milk, and was not a mere artificial fat. Its fatty character had, however, been entirely changed, and the glycerides of which the fat had originally consisted had been decomposed so as to leave simply a mixture of the fatty acids, which constitute the acid portion of animal fats. The butter had, in fact, become changed into a substance closely resembling in character and composition the substance of which good composite candles are composed. The result is singular, as showing that length of time, combined with exposure to moisture, will effect the decomposition which the manufacturer of stearine has to effect by the agency of heat and acids. At the same meeting another paper was read on a sample of still older butter, which had been taken from an alabaster vase in an Egyptian tomb. It had evidently been melted and poured into the vase, and carefully sealed over. This sample was probably about 2,500 years old, but the preservation had been so perfect that it was only slightly rancid, and had fully retained the chemical properties of genuine butter, the fats not having been decomposed to any sensible extent. This sample possessed a decided taste and smell of butter, while the sample from the bog was cheesy rather than buttery in smell.

A JAPANESE INVENTION.—The Japanese have devised a new process for photo-engraving, which is described as follows: A substance is used in making Japanese lacquer which becomes as hard as stone when exposed to the action of sunlight. A slab covered with this material is exposed 12 hours to daylight, which is allowed to pass through the "negative" plate placed in front of it. By this time the slab has become hardened to different degrees, according to the intensity of the light falling on it, or in other words, according to the light and shade of the negative in front; and upon carefully scraping away the softer parts a pictorial surface in low relief is obtained similar to an engraver's block, and suitable for printing from.

Natural Lime.

Among the recent discoveries is "natural lime," which occurs in Kansas. It is found in large beds; is of a fine, white color and very fine in texture. It is also soft, smooth and readily converted into a plastic condition by the addition of sand and water. The mortar thus made has apparently the same qualities as the best made from superior "burned lime" from the kilns. It sets and hardens quickly and turns very white.

This discovery brought out the query as to whether such a strange product as this occurs in any other section of our continent. In answer the *Scientific American* gives a letter from Wm. M. Pierson, of Fort Bayard, N. M., in which that gentleman says: "I answer, yes. From 1870 to 1874, I was U. S. Consul at Paso del Norte, Mex., and, while prospecting for silver ore, I discovered a large deposit, in what miners term pocket formation, of natural lime, located in blue limestone, in the foothills, one and one-half miles west from the city of Paso del Norte, Mex. I gave it various trials, and found it to possess all the good qualities of manufactured lime, and for whitewashing far superior to the manufactured article."

IMPROVED METHOD OF MANUFACTURING NITROGLYCERINE.—The French Academy of Science have awarded a prize of $500 to Bouhing & Foucher for an improved and less dangerous method of manufacturing nitroglycerine. This method has been for some time in actual use at Vouges, France, without meeting with any accident. The process is described as follows: In the old method, in which fuming nitric acid or a mixture of it and nitric acid is made to act on glycerine, and the mass is suddenly immersed in water, the reaction often produced heat sufficient to decompose a part of the nitroglycerine, occasioning violent explosions in spite of the refrigerating processes adopted. The principle of the new process consists in obviating the greater part of the heat by first engaging the glycerine in combination with sulphuric acid, forming sulphoglyceric acid, and then destroying slowly, by means of nitric acid, the sulphoglyceric compound. Two liquors are prepared in advance—a sulphoglyceric and a sulphonitric, the latter with equal weights of sulphuric and nitric acids. As they heat considerably they are allowed to cool, and are then combined in such proportions that the reaction takes place slowly. In the old method the nitroglycerine is separated almost instantaneously, and rises in parts to the surface, rendering washing difficult. In the new method it forms in about 20 hours, and with a regularity which prevents danger. It also goes to the bottom, and can be washed rapidly.

PASSIVITY OF IRON.—Concentrated or fuming nitric acid does not corrode iron; on the contrary, when iron is dipped into it, it acquires the singular property of resisting the attacks of diluted acid. The fuming acid is said to render the iron passive. Dumas first called attention to this fact in his lectures. It was afterwards studied by the elder Becquerel, de la Rive and others, who offered various hypotheses to account for the phenomenon. It was commonly thought that a film formed on the surface of the metal, consisting either of an oxide or of an insoluble nitrate, which constituted a sort of varnish and thus prevented any further attack. L. Varenne has found that the passivity depends in great measure upon the degree of condensation in the metal, but that in all cases it may be overcome by shocks, and even by extremely feeble vibrations which are excited by the action of an electro-magnet. Moreover, a current of gas, even though very feeble, usually destroys the passivity. Varenne finally concluded that the phenomenon was entirely due to a gaseous film on the surface of the metal, and his belief was confirmed by finding that the passivity ceased entirely in vacuum. He thinks that the film consists principally of gaseous nitric oxide. He proposes to extend his researches, in order to find what are the causes which lead to the formation of the film, and what is the nature of the influences which afterwards maintain its adherence.—*Ann. de Chim. et de Phys.*

SAFETY LAMP UPON A NEW PRINCIPLE.—Herr Koerner, a student of the Freiberg School of Mines, proposes to prevent colliery explosions by the use of a lamp which embodies an interesting novelty. Its action is based upon the property of the platinum black, of condensing on its surface not only oxygen, but also light carburetted hydrogen. In a wire gauze chamber are placed pieces of pumice stone impregnated with platinum black; and as all the air for maintaining the combustion passes through the chamber, all the fire-damp is destroyed before it reaches the open flame.

A NEW THERMO-ELECTRIC PILE.—M. Clamond a French electrician, is reported in *La Nature* to have devised a *thermo-electric pile* upon a novel principle, which is capable of yielding electrical currents of considerable tension. A large instrument of this kind has been successfully employed to run several electric lights.

ANTHRACITE IN EUROPE.—Recent analysis of the *anthracite coal of Valois*, Switzerland, show a very close resemblance to that of Pennsylvania. Trials with American heaters show that it can replace the Pennsylvania coal. It has also been successfully tried on locomotives.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 20.		Week Ending May 27.		Week Ending June 3.		Week Ending June 4.	
Alpha	7	5	6	5⅛	6⅞	5⅜	6	4⅜
Alta	3.05	2	2.60	2⅛	2.70	2.40	2⅛	2
Andes	1.10	80c	95c	75c	95c	75c	80c	75c
Alps	....	....	....	....	....	....	....	....
Argenta	25o	20c	20e	....	45c	20c	50c	45c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	50c	30c
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	3.60	2.85	3.15	2.60	3.15	2.70	2⅛	2
Belmont	55o	25c	40c	....	25c	....	15c	....
Best & Belcher	14⅛	8⅛	11⅛	9⅛	11	10	9⅛	8⅛
Bullion	3⅛	2.95	3⅛	2.80	3	2⅛	2⅛	2
Bechtel	1⅝	1.70	1⅛	1.50	1⅛	1	1⅛	1⅛
Belle Isle	50c	45c	50c	45c	50c	....	45c	....
Bodie	7⅞	7⅛	8.60	7⅛	8⅛	8	8	7⅛
Benton	1.95	1.40	1.70	1⅛	1.60	1.45	1.30	1
Bulwer	6⅛	5⅛	6	5⅛	6	5⅛	5⅛	5
Boyle	....	....	....	....	....	....	....	....
Black Hawk	75c	60c	65c	....	65c	60c	80c	75c
Belvidere	2⅛	2.45	2⅛	2.40	2⅛	2⅛	3⅛	2⅛
Booker	40o	35c	40c	35c	40c	35c	60c	30c
Caledonia	70c	40c	60c	40c	40c	25c	80c	60c
California	2.90	2.10	2.30	2.10	2.20	2	2.15	2
Challenge	1.80	1.30	1.55	1⅛	1⅛	....	1.45	....
Chollar	4⅛	3.60	3.80	3⅛	4	3.30	3⅛	3.15
Confidence	7⅛	4⅛	6	5⅛	5⅛	....	5⅛	5
Con Imperial	45c	35c	45c	30c	85c	30c	40c	35c
Con Virginia	3⅛	3	3.15	3	3.45	3	3.35	3.10
Crown Point	2.30	1⅛	1.90	1⅛	1.95	1⅛	1.90	1.35
Con Washoe	....	....	....	....	....	....	....	....
Champion	75o	60c	75c	60c	70c	60c	1⅛	65c
Concordia	80c	70e	80c	75c	60e	45c	85c	60e
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	55o	45c	55c	70c	80c	60c	75c	55c
Eureka Con	19	18⅛	18	17⅞	18⅛	17⅛	19⅛	18⅛
Exchequer	2⅛	1.95	2⅛	2	2⅛	2.10	2.10	1⅛
Endowment	15c	....	....	....	....	....	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1.10	85c	1.10	70c	1	90c	1.10	95c
Gila	....	....	....	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodsbaw	95c	60c	75c	65c	1.05	75c	3⅛	1.45
Gould & Curry	6⅛	3⅛	4.85	3.85	4.30	3.85	3.90	3⅛
Hale & Norcross	5⅛	3.10	4.60	3.60	4.20	3⅛	3.60	3
Hillside	75c	....	....	....	50c	....	75c	45c
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	25o	....	50c	40c	40c	....	....	....
Julia	90c	70c	70c	55c	65c	25c	35c	30c
Justice	1.30	90c	1.15	75c	85c	75c	75c	35c
Jackson	3	....	2⅛	....	....	....	2	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	4⅛	....	....	....	4⅛	....	4⅛	....
Kentuck	....	....	2	....	2	....	2	....
Kosouth	....	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	60c	35c	40c	....	35c	....	35o	30c
Leopard	....	....	....	....	....	....	....	....
Leviathan	30c	25c	25c	20c	....	....	25c	10c
Leeds	....	....	....	....	....	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	20c	....	....	....	....	30c	20c
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	90c	....	95c	....	....	....
Martin White	60c	....	....	....	60c	50c	75c	65o
McClinton	55c	35c	50c	40c	65c	40c	65c	50c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	11⅛	8⅛	8⅞	7	10⅛	7⅞	9⅞	8⅛
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	65c	45c	60o	50c	65c	25c	30o	25o
Northern Belle	11⅛	8⅛	11⅛	10⅞	11⅛	10⅛	12⅜	12
New Coso	....	....	....	....	....	....	....	....
Navajo	25	....	20c	....	20c	....	....	....
Occidental	2	1.20	1⅞	1.30	1⅛	1.35	1.40	1
Ophir	11⅞	8⅛	10⅞	8⅛	9⅜	8⅛	8⅛	6⅞
Oriental	....	....	....	....	....	....	....	....
Overman	2⅛	1⅛	2⅛	1.60	2.10	1.35	1.85	1.70
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	....	....	....	....	....	....	....	....
Potosi	3⅛	2⅛	3	2⅛	3	2.70	2.80	2⅛
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	30o	25c	25c	....	25o	....	25c	20o
Richer	....	....	....	....	....	....	20o	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	5	3.15	4.05	3.30	3.55	3.15	3.20	2⅛
Seg Belcher	11	8	8	....	8⅛	8	....	....
Sierra Nevada	18	10⅛	15⅝	12⅛	16⅛	13	15⅝	13
Silver Hill	1	15c	80c	60c	76c	65c	70o	55c
Silver King	4.10	4	5	4⅛	5⅛	....	5	4⅛
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	2	1.40	1.80	....	1⅛	1.85	1.60	2
Scorpion	1.80	1.15	1.65	1.10	2	1.60	1.65	1⅛
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	80c	20c	30c	25c	....	....	30c	....
South Standard	....	....	....	....	....	....	....	....
Star	30c	25c	....	....	....	....	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1⅛	1.10	1⅛	1	1	95c	1.05	90c
Tioga Con	1.90	1⅛	1⅛	....	1.60	1	2	1⅛
Tiptop	6⅛	6	6⅛	5⅞	6⅛	5⅛	7	5⅞
Trojan	5c	....	....	....	....	....	....	....
Union Con	23⅛	18	19	16⅞	22⅛	18	20⅛	18⅛
Utah	14	7	10	8⅛	12⅛	8⅛	11	9⅛
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.40	....	1.70	1⅛	....	....	1.60	1⅛
Wells-Fargo	....	....	....	....	....	....	....	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	7⅞	5	6⅞	5⅛	8	5⅜	6⅛	5⅜

Sales at S. F. Stock Exchange.

Thursday A.M., June 10.

10	Alpha	190	Bodie
200	Andes	15	Belmont
180	Alta	30	Belle Isle
150	B & Belcher	50	Belvidere
470	Bullion	150	Black Hawk
790	Belcher	135	Booker
265	Benton	100	Boston
60	Caledonia	680	Champion
2030	Con Dorado	150	O Pacific
310	Crown Point	100	Concordia
200	Con Imperial	800	Day
525	Con Virginia	155	Standard
50	Chollar	455	Eureka Con
305	California	550	E Mt Diablo
445	Exchequer	825	Grand Prize
70	Gould & Curry	50	Goodsbaw
220	Hale & Nor	100	Golden Terra
305	Justice	100	Holmes
250	Julia	335	Independence
260	Lady Wash	250	Jupiter
215	Mexican	1200	Mammotb
100	Mountain View	60	May Belle
300	Mackey	120	Monro
235	New York	150	McClinton
250	N Bonanza	15	Mt Pototsi
535	Ophir	200	Mt Diablo
50	Occidental	100	Noonday
430	Potosi	120	N Noonday
275	Scorpion	300	Northern Belle
105	Savage	100	Orient
445	Sierra Nevada	250	Oro
900	Silver Hill	100	Queen Bee
175	Utah	50	Raymond & Ely
540	Union	100	Richer
80	Yellow Jacket	250	Red Cloud
		440	Syndicate
	AFTERNOON SESSION.	650	Summit
450	Argenta	300	S Bulwer
500	Albion	50	S Noonday
500	Aurora	50	Tiptop
330	Addenda	1075	Tioga Con
60	Bulwer	200	University
			Wales

THE American rifle team sailed June 3d from New York for Ireland.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt. Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	12	1 00 May 12	June 16 July 7	W Willis	309 Montgomery st
Argenta M Co	Nevada	5	25 Apr 28	June 2 June 22	E M Hall	327 Pine st
Booker Con M Co	California	5	20 May 10	June 15 July 7	W H Lent	309 Montgomery st
Bullion M Co	Nevada	15	1 00 June 2	July 7 July 27	J M Brazell	328 Montgomery st
Caledonia M Co	Nevada	31	50 May 4	June 8 June 28	R Wegener	414 California st
Con Imperial M Co	Nevada	11	10 May 5	June 8 June 28	W E Dean	203 Bush st
Crown Point M Co	Nevada	41	50 May 8	June 11 July 2	J Newlands	203 Bush st
Dudley M Co	California	8	25 Apr 20	May 24 June 22	E C Masten	309 Montgomery st
Gila S M Co	Nevada	7	25 Apr 20	May 24 June 14	W W Parrish	330 Pine st
Hale & Norcross	Nevada	64	50 May 11	June 16 July 3	J F Lightener	309 Montgomery st
Independence M Co	Nevada	6	25 Apr 19	May 25 June 14	E M Hall	327 Pine st
Julia Con M Co	Nevada	12	40 May 12	June 16 July 6	H A Charles	419 California st
Justice M Co	Nevada	32	50 May 22	June 26 July 19	R E Kelly	419 California st
Mexican G & S M Co	Nevada	11	1 00 Apr 28	June 1 June 21	C L McCoy	203 Busb st
Mackey G & S M Co	Nevada	3	10 Apr 25	June 1 June 21	J M Buffington	309 California st
Modoc Con M Co		9	1 50 Mar 18	Apr 26 May 17	J W Few	310 Pine st
Red Cloud Con M Co	California	7	20 May 11	June 17 July 9	W J Taylor	310 Pine st
Sierra Nevada	Nevada	63	1 00 April 30	June 4 June 21	D L Parker	309 Montgomery st
Silver Hill M Co	Nevada	10	50 April 14	May 19 June 9	W E Dean	203 Bush st
Scorpion M Co	Nevada	7	40 Apr 26	June 7 June 30	Geo R Spinuey	310 Pine st
South Standard M Co	California	6	20 April 29	June 3 June 23	C A Sankey	331 Montgomery st
Utah S M Co	Nevada	30	2 00 Apr 26	June 2 June 22	G C Pratt	309 Montgomery st
Yellow Jacket M Co	Nevada	37	1 00 May 1	June 5 July 7	M Otey	203 Bush st
Wells Fargo M Co	Nevada	14	10 May 26	June 28 July 19	A Colburn	318 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Argonaut M Co	Arizona	1	03 May 26	July 3 July 24	J Pentecost	702 Market st
Atlanta M Co	Utah	1	05 Jan 2	June 24 July 19	A F McGrew	420 Montgomery st
Atlas M Co	Utah	1	20 May 19	June 23 July 14	A F McGrew	420 Montgomery st
Black Rock M Co	California	3	15 Apr 2	May 21 June 21	N T Root	225 Bealo st
Concordia M Co	California	3	15 April 1	June 3 Aug 2	Wm J Taylor	310 Pine st
Cumberland G & S M Co	Arizona	1	30 June 8	July 19 Aug 9	Jno H Griffiths	328 Montgomery st
Defiance G M Co	California	5	25 May 20	June 28 July 21	W H Lent	309 Montgomery st
East Mt Diablo M Co	Nevada	1	10 May 7	June 14 July 6	G W Fisber	324 Pine st
Empire G & S M Co	California	2	10 June 4	July 7 July 26	Jno McGeogbegan	316 Pine st
Excelsior Deep Gravel M Co	California	10	10 Apr 21	May 24 June 15	D F Verdenal	327 Pine st
Fairfax M Co	Nevada	2	20 Apr 7	May 26 June 16	O C Miller	324 Pine st
Gover M & M Co	California	42	20 May 5	June 21 July 14	W O Wilson	402 Front st
Morgan M Co	California	6	50 May 14	June 21 July 15	J J Raphael	533 Kearny st
Monte Cristo Con M Co	California	3	10 May 26	July 5 Aug 6	Butler Burris	309 Montgomery st
Mt Potosi Con M Co	Nevada	3	2 50 May 11	June 14 July 6	E A Holmes	318 Pine st
Murchie G & S Co	California	3	25 Apr 20	May 21 June 21	S D Rodgers	328 Montgomery st
Northern King M & M Co	Arizona	4	20 May 24	June 19 July 12	E A Holmes	310 Pine st
Original Keystone S M Co	Nevada	3	50 May 26	June 23 July 21	F E Luty	330 Pine st
Oro Blanco M Co	Arizona	1	20 May 3	June 7 June 28	W O Gould	220 Sansome st
Paris M Co	California	1	10 June 1	July 7 July 30	Wm J Taylor	310 Pine st
Swamp Angel G M Co	California	1	12 June 2	July 24 Aug 12	Chas W Badger	315 California st
Vanderbilt M & M Co	Nevada	1	15 Apr 12	May 20 June 16	J Morizio	328 Montgomery st
Wide Awake M Co	Arizona	10	05 May 22	July 1 July 20	C Hildebrandt	232 Sutter st
Wyoming Coal M Co	Wyoming	2	3 April 21	June 10 July 10		
Wyoming & Dakota W Co	Dakota	2	1 00 May 6	June 16 June 30	T Widman	404 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alpha Con M Co	Nevada	Wm Willis	309 Montgomery st	Annual	June 21
El Tesoro S M Co	——	W H Chickering.	214 Sansome st	Annual	June 15
Mammotb M Co	California	A W Rose, Jr.,	302 Montgomery st	Annual	June 15
Randolph Con M Co	California	W W Bausman	409 California st	Special	June 15
Tybo Con M Co	——	Wm W Parrish	330 Pine st	Annual	June 17
Vanderbilt M & M Co	——	J Morizio	328 Montgomery st	Annual	June 19

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Q M Co	California	W L Oliver	Safe Deposit Bldg	25	May 16
Cherokee Hill Blue Grav M Co	Cal	R N Van Brunt	318 Pine st	4 25	Mar 13
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	May 20
Father De Smet Con M Co	Black Hills	Tbeo Widmann	404 Montgomery st	50	Apr 24
Idaho G M Co	California	C Meade	324 Pino st	2 00	Apr 9
Napa Quicksilver Con M Co	California	Wm W Parrish	330 Pine st	10	June 10
Natoma Water & M Co	California	——	——	2 00	Apr 5
Northern Bell M Co	Nevada	W Willis	309 Montgomery st	50	May 16
Ontario M Co	Utah	——	——	50	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12
Seventy-six S M Co	Nevada	E F Stone	306 Pine st	03	May 24

The Tendency to Processes.

Scarcely a month passes in which there is not somewhere an announcement of the discovery of a new process for the more successful and economical reduction of silver and gold ores. And it is a noticeable fact that the process rarely comes from the laboratory or anyone well grounded in the science and practice of metallurgy, but generally from the much-vaunted "practical" man.

Our miniug centers, especially the new ones, literally swarm with process-men, and their processes invariably savor of the miraculous. There must be a fascination in the business, for the tendency to discover a process for the improved treatment of the ores of the precious metals, seems to be confined to no class or calling. The number of men who can save all the gold or all the silver is legion. No one is safe from the seeming mania. Even the active-brained and ingeuious Edison is diverted from his apparently absorbing experiments with his electro-chemical lamp, to the thinking out of his elcctro-chemical process for the extraction of gold from the mnch-manipulated tailings of placer and gravel claims. And we hear that some one is about to pitch out a process for the use of the water of Mono lake in beneficiating ores. As we have said, processes are generally rife in the newest mining regions. Several years ago the writer went to Colorado, to introduce a new furnace and process. It was up hill work, for that mining community has been processed beyond its credulity. Dilapidated and abandoued works, containing fragments of incomprehensible machinery, were met in nearly every district. One morning in Central City he attracted the attention of a group of men, one of whom asked who the stranger was, and got this reply: "That fellow is our latest saviour and has brought us a new plan of salvation. He is the last furnace-and-process man."

The question occurs: Is there actual ueed for a twentieth part even of the new processes? The operation of extracting the gold from ordinary ore is simple enough and withal satisfactory; and the more complex combinations are snccessfully treated by well-established scientific methods. The reduction of silver ore is a nicer and more difficult matter and demands the largest science and skill. Yet a well known writer on the metallurgy of silver, remarks, "that the earliest method of obtaining silver from its ores, of which we have any knowledge, bears an astonishing resemblance to that in vogue at the present day," and to add point to his remark the writer quotes from the prophet Ezekiel: "As tbey gather silver, and brass, and iron, and lead, into the furnace, to blow the fire upon it, to melt it." The application of cbemical science to tbe operations of metallurgy has led to precision, economy, and almost the minimum of loss. But the largest saving and economy have been obtained by mechanical devices, some of tbe most important of which have been introduced of late years. Here is the real field for the man of inventive faculty, and if such one feels bimself stirred by the impulse of invention let him evolve a new machine; some device to better pulverize, or roast, or amalgamate, or smelt, or concentrate, or lixiviate ores. A device adapted to achieve either of these purposes would confer practical good on the metallurgist and would greatly benefit tbe inventor.

The average process, which generally involves profound cbemical principles, is usually tbought out, but seldom wrought out, by the self-made man. The tendency to processes for treating ores of the precious metals comes from that "little knowledge" which is dangerous. A carefnl study of some standard manual of metallurgy—some hand-book, say like Kustel's "Roasting of Gold and Silver Ores"—would cause many a man to discard his idea of seeking for a new process; would save tbe profession of metallurgy from much discredit, and would prevent the waste of untold thousands.

The Mining Share Market.

Excepting a brisk demand for several of the Bodie shares the transactions in the market differed very little from those reported last week. So far as the Comstocks are concerned the only apparent policy of the managers is delay; if it is so, it is to be hoped that the inactivity will prove to have been masterly. The shares of those mines are now conspicuous for tbeir dullness. The Bodies continued in demand for several days, and prices were maintained against large sales, but they finally broke sharply, and tbe market closed weak and dull.

No changes on the Comstock have been reported from Virginia City, beyond the statement that it will be fully two weeks before the main line of pumps will be in operation down to the 2500 level of the Union shaft, and that when the pumps are in form a drift will be started for the 2500 station of the Sierra Nevada, in running which it is believed ore ought to be found.

During the week favorable reports were received from several mines in Bodie—uotably Belvidere, Mono and Goodshaw—and the promise of the district is large. In Columbus district also valuable developments are reported, and its shares are attracting renewed attention.

MINING SUMMARY.

The following is mostly condensed from journals published in tbe interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MAHONEY MINE.—*Sentinel*, June 2: The men who were on duty at the Mahoney mine for 8 years, guarding the mine, have received their discharge. S. D. R. Stewart has gained possession and will probably start the mine in operation at an early day; and it is reported that a 20-stamp mill will soon be built for the mine.

AMADOR QUERIES.—*Dispatch*, June 6: This is tbe name by which the quartz mine now being developed by Morgan & Co., in Hunt's gulch, is now known. The shaft is now down about 100 ft, at which depth they have a 5-ft ledge of excellent rock, and the ledge continues to widen as they go down. We hope soon to report the commencement of the orection of a splendid mill on the premises.

PLACER MINES.—*Ledger*, June 5: More work has been done in gravel claims around Pine Orove this season thus far than for years. Quirolo & Co. have an hydraulic claim in full blast. The Grass Valley claim is running a good force, under the management of J. Bradshaw. J. T. Wheeler is operating a claim near the Grove. W. P. Hayes and others have been employed through the winter on a placer mine on the Hanly ranch, this side of the Grove. All these claims seem to be turning out satisfactorily.

BUTTE.

WYANDOTTE MINE.—*Mercury*, June 4: Supt. H. E. Winslow started the Cranston elevator to work on the ground of the Wyandotte hydraulic gold mining company Friday. Large returns are anticipated, the bauk of gravel being regarded as exceptionally rich.

ITEMS.—It is reoorted that new mines are being opened near Dry Creek. The new sbaft of the Pacific goes on contract to-morrow for 100 ft.

BLACK SAND DEPOSIT.—Many years ago tbe Blue Gravel company ran a tunnel into a hill located about 2 miles from Dogtown. They encountered a large deposit of black sand, and after digging through it a distance of 350 ft, ceased operations and began anow in another direction. Last fall, Major McLaughlin sent a lot of the sand East to Edison. Saturday last he received a dispatch from E. askiug for further information regarding the deposit, and requesting that another lot of the sand he sent on. Monday the Major again visited the property, took out 60 lbs of the sand and takes it East with him to-morrow. The dispatch, though stating nothing positive, was couched in such language as to warrant a belief that the sand is very rich in gold. Mr. McL. says there are millions of tons of the article, and that it can ho obtained at a comparatively trifling cost.

CALAVERAS.

MINING NOTES.—West Point Cor. *Chronicle*, June 5: Once more our quartz mills are grinding and crushing out the precious metal; all are busy—no idlo men, no idle mills. Our mines are turning out good, and capitalists appear to he pleased by their prospects. There are at present 4 outside companies working in this district, viz., the Louo Star company, Anderson Flat, Enterprise and the Hunter's Flat gravel company, all of whicb are above par. Tbo Champion mine is stoping out its treasure again. Ferhur & Co. have struck very rich rock in the Lockwood mine. O'Neil & Co. have struck a new pay chute in the Lone Star, which is being largely developed under their nanagement. Porteous & Co. have struck good placer diggings at Bummerville. C. Brown and J. Bardsley are taking rich rock on the old Whisky lode.

GRAVEL MINES.—The claims are all in full operation, and the chances are extremely favorablo that they will remain so the balance of the season. We shall ho able to report the biggest clean-ups over made in Calaveras county within the next month.

EL DORADO.

MINING NOTES.—Spanish Flat Cor. *Republican*, June 3: Lumber is being hauled past here every day to erect a 10-stamp mill on tbe Chapparel mine, in Kelsey district. I have seen 3 ounces of gold dust, sold to T. F. Lewis by Jo. Smith, of Dry Creek, the handsomest I have ever seen taken from one claim. He says there is plenty more there just like it. An Indian brought in a piece of gold to-day which he took from a piece of quartz rock. It was very thin and flat, and weighed a little over $2—a good prospect in quartz.

GREENWOOD MINES.—Cor. *Republican*, June 3: Prospecting on various mines is being prosecuted with more or less activity. Mine owners are doing their own work very generally; chiefly running tunnels. Mr. Leavitt will commence work in the morning on a quartz mine below town, which he has lately bonded.

RINGOLD MINE.—*Democrat*, June 5: The Ringold company is pushing along on the old Epley. A little engine has been placed in position at the hoisting works. The old shaft, which is 240 ft in depth, is being repaired as the removal of the water progresses. It has been retimbered to a depth of 30 ft. The hoisting ie done with iron buckets and a steel cable. A substantial building is being erected over the shaft. A quarter of a mile south of shaft No. 1 is a second shaft, which has heen sunk to a depth of 30 ft. Work will be resumed here, also. At this point, for a distance of several hundred ft, the croppings are from 8 to 14 ft in width. Land for a mill site has been purchased from Mr. Albright. The mill will probably be ready as soon as the mine has been thoroughly opened ready for the extraction of ore.

A RICH STRIKE.—The parties who are driving a tunnel into Cedar hill, west of the Diekerhoff mine, have struck a spleudid channel of auriferous gravel. Those who have examined the ground, think it a lead never before touched. It is believed it will yield $3 per car hy washing, and would be still more profitablo if crnshed.

PROSPECT FLAT.—The owners of this mine have good reason to be satisfied with the outlook. We understand their clean-ups are improving every week. They are now stoping pay gravel of such depth that only a portion can be worked on account of the difficulty of timbering. Between Coon Hollow and White Rock there is 10 miles of channel of which not one-tenth has been thoroughly prospected. Good pay has been found all along wbere work bas been done.

ROSECRANS MINE.—This mine is 1½ miles from Garden Valley; its shaft is 100 ft deep on a 4-ft ledge. They are now taking out some excellent ore, much of which prospects as high as $200 per ton of free gold. Tbe sulphurets are of high grade. They are running 2 shifts of 4 men each. The ledge ie nearly perpendicular, dipping slightly to the west. The quality of the rock improves in depth. Tbe main building over the hoisting works is 60 by 36 ft. The hoisting engine is 45-horse power, the pumping engine 20 and the engine in the mill 60-horse power. There are 3 compartments at the entrance of the shaft, 1 each for hoisting, cage and pump. Some 50 yards below is a 10-stamp mill, favorably located for receiving the quartz, wbich is run on a track from the mine. Tbe mill will start up in a few days with 200 tons of ore on hand. These works are all new and first-class in every respect, having been put up last summer.

FRESNO.

RICH DISCOVERY.—The *Republican* of a recent date says there is great excitement ou Sycamore creek, 8 miles from Fresno, over the discovery of a gold and silver-bearing ledge 11 ft thick, and assaying $30 in gold per ton, and is rich in silver. In early days there was a great deal of gold taken out of Sycamore creek hy placer miners, and the stream has heen worked more or less ever since. The gold found in tbe bed and bars of the creek did not appear to have been washed any great distance, and many old miners who have worked tbose placers have heen confident that a rich ledge was yet to ho found in that vicinity. Our informant says the lately-discovered ledge is located for a distance of 6 miles.

LASSEN.

COOK'S CANYON MINES.—Cor. *Advocate*, June 5: Cook's canyon comes into the north arm of Indian valley, between Taylorville and Mountain Meadows, and gives name to this mining district. These mines were discovered by a man named Rider, 3 years ago, and have been worked continuously since, when sufficient water could be procured to wash the gravel. There are now 5 claims or companies at work in full blast, and it is expected that this season's work will prove very remunerative. Good wages have been made in the district heretofore, but the owners of the claims have been compelled to expend all they made in digging ditches, building flumes, etc. A rich channel was struck in the Rising Star claims, owned by G. A. Chipman, on the 20th of May, which prospects as high as 10 to 20 cents to the pan. The gold is fine, and therefore there has been much loss by reason of the primitive methods employed, but improved appliances are now being used. A project is on foot to tap Caribou lake, some 12 miles distant, and when this is accomplished, water will be plentiful for quite a long season's work. There are at present about 20 miners in the district.

MARIPOSA.

ENTERPRISE MINE.—*Gazette*, May 29: This mine, which is located in the neighborhood of Hornitos and the Washington mine, is putting up some extensive works. The ore taken out is immensely rich. Between 15 and 20 men are working at the mine. The owners are contemplating putting up a 40-stamp mill.

MONO.

BODIE DISTRICT.—*News*, June 2: On the 500 level of the Belvidere the main south drift is in 113 ft; progress during the week, 30 ft. The ledge is fully 4 ft wide between the walls, one-half of which is good ore.

TIOGA.—Supt Golding reports: Since last report our west crosscut, 800 level, has been advanced 30 ft. The face still continues to show clay and quartz mixed, yielding assays ranging from $4.84 to $20.64 in gold and silver per ton.

NOONDAY.—Supt. B. B. Taylor reports May 20th: The south stope, 200 level, is as last reported, and from it we are obtaining good ore for the mill. The No. 2 north 300 stope is opening up as fine a body of ore as ever stoped south, and the quality of the ore is also improving. The east crosscut from south end of main south drift, 300 level, has been advanced 10 ft during the week. The face of crosscut to-day is in quartz. No. 1 north drift, 400 level, has been advanced 12 ft during the week. The face of this drift looks very promising. We are still crosscutting the No. 1 south vein, 400 level. The crosscut was run east 11 ft and has been run west 21 ft. The face of the west crosscut was in quartz to-day. The vein is somewhat broken. The entire 32 ft is in the ledge. The south drift, 400 level, has been extended 14 ft during the week. North drift, same level, has been extended 22 ft during the same time. Both drifts and the stope on this level are looking well. The incline from 500 level has been sunk about 18 ft.

JUPITER.—Supt. Holmes reports May 20th: On the 600 level the west crosscut is in most favorable ground, in which we will make good progress during the coming week. We will continue sinking the main shaft until we reach the 700 level, or water enough to run our boilers. On the 500 level, in south drift No. 3, we continue to follow the ledge, still pitching to the east and north, the drift having a course as at date of last report, nearly due east. The ledge maintains a width of from 12 to 18 inches, all good ore. Average assays of ore extracted during the past week, $60 per ton.

STANDARD CON.—*Free Press*, June 5: The north drift from the east crosscut, 700 level, is in 105 ft, having been extended during the week 55 ft. The north drift, 500 level, is in 12 ft. The south drift has been run 14 ft. The work of timbering the drift on the 385 level is now completed. The north drift on the main ledge, 550 level, has been advanced 13 ft; total length, 186 ft. There is no change to note in the appearance of the different stopes throughout the mine.

BULWER CON.—The south drift on the Stonewall ledge, 280 level, has been extended during the past week 12 ft; total length, 90 ft. The ledge is 2½ ft wide and is looking well. The south drift on the Ralston has been run 14 ft; total length, 210 ft. The ledge is 3 ft wide of milling ore.

SUMMIT.—The north drift, 530 level has been advanced 12 ft; total length, 318 ft. The ledge is 3 ft wide. The south drift is in 249 ft; progress for the week, 11 ft, showing a vein in the face 12 ft wide. The east crosscut from the south drift, 530 level, has been run 12 ft, and is at present in hard rock.

MCCLINTOK.—The three compartment shaft of this mine is now 150 ft below the 300 level, and well timbered. The ground is porphyry, interspersed with iron pyrites and bunches of quartz.

MINING NOTES.—*News*, June 4: At the Addenda they are opening up the station at the 500 level, preparatory to crosscutting. At the Goodshaw they are driving ahead on the 550 level and drifting on the ledge lately cut. At the Champion they are sinking the shaft in hard rock. At the Mono they are driving the joint drift on the Bodie and Mono line and raising and sinking the winze to connect the 400 and 475 levels. At the South Bulwer they are driving the north and south drifts on the ledge recently cut on the 550 level. At the University they are sinking the shaft and opening up the ledges cut on the 500 level. At the Noondays they are setting up the machinery on the 512 level at the incline shaft, and are raising daily about 125 tons of milling ore. At the Booker they are driving the east crosscut rapidly forward in a vein formation of the most favorable character.

NEVADA.

GRAVEL MINE ITEMS.—*Herald*, May 29: Hydraulicing has been commenced at A. J. Turner's claim, situated at Hunt's hill. A clean-up was made at the Sailor Flat hydraulic diggings during the present week, and the result yielded two gold bars valued at $10,000. The Wind-up G. M. Co., at Quaker Hill, commenced tunneling a few days ago. The clean-up at John Noyes claim at Quaker Hill, this week, gave a satisfactory yield.

IDAHO MINE.—Grass Valley *Union*, June 2: The bullion product of the Idaho mine for the month of May was the best for many months, amounting to $44,000. The mine is looking well, and there is a probability of a return, during the season, of the old time monthly dividends, which were $5 per share. The June dividend has not yet been declared, but it is announced that it will be $3 per share. The Idahó promises to continue to hold its place as the great gold-producing mine of the State.

SAPSUCKER MINE.—*Transcript*, June 2: The parties having the contract to run 100 ft of tunnel at the Sapsucker drift mine near Quaker Hill, completed the job last Saturday. It is not determined yet whether work will be resumed immediately on the claim.

GRASS VALLEY ITEMS.—A rich lot of quartz is now being milled from the Ford & McDonald claim on New York hill. Ruhe Thomas is "piping" regularly on his claim on the Grass Valley slide, and expects to have a later run than in any previous season.—*Union*.

FORTUNA MINE.—Grass Valley *Union*, June 5: The now hoisting works of the Fortuna mine have been running for a week or more, the machinery being strong and working well. Good provision has been made for handling water, as a 9-inch pump is used to the present depth of the new shaft, 122 ft, and below that point a 7-inch puump will be used for sinking. The water has been pumped out of the mine, and 3 8-hour shifts are now engaged in sinking the shaft, which will be put down 80 ft, which will make the full depth 200 ft, when a drift will be started. The rock now being taken from the shaft is of good quality, and shows well in sulphurets. The ledge is a strong one, and at the present depth is about 9 ft in width. The shaft is perpendicular to the depth of 122 ft, and will be carried down in the same way, as the ledge, so far, is nearly upright between the walls.

PLACER.

HOLLIS MINE.—Dutch Flat *Forum*, June 3: This mine, at Elmore hill, has been piping regularly for the past month, a clean-up was made last week and the result is said to be very gratifying to the owners. The water was turned off Wednesday for the purpose of moving some of the pipe.

QUARTZ MILL AT HUMBUG.—Some San Francisco parties, who were in town last week, have completed their arrangements and will proceed to erect a quartz mill at Humbug mining camp below Green Valley on the American river. The mill is to be shipped and erected at once.

YUBA QUARTZ MINE.—*Foothill Tidings*, June 5: Work has been resumed on this mine, situated on the South Yuba, just above Washington, under the superintendency of Mr. Geo. Lord, of this place, who is now getting the mill in order; and indeed the mill would now be ready to run but for the unavoidable delay in getting the copper plates. Work in the mine is being pushed ahead and the ledge is said to be looking well.

SOUTH IDAHO.—This mine is said to be in a fair way to development, as a San Francisco company are said to be willing to furnish the necessary capital for sinking the 100 ft deeper, which will make it 175 ft from the surface. The ledge in the shaft is a strong one, being 7 or 8 ft thick, and shows well in heavy sulphurets.

SOUTHMAN'S CREEK.—Report is that very rich gravel has been recently found in this mine, and as water is plentiful and the claim in good order, there seems to be no reason why a most prosperous run should not this year be made.

LOWELL HILL ITEMS.—*Herald*, June 5: T. S. Myrick, now at Lowell Hill, in a letter to a friend here, includes the following items: The snow is gone, excepting large drifts here and there. The ditches are full of water. The Little York Co. are running 4 hydraulic claims, one at Little York, one at Christmas Hill, one at Liberty Hill, and one at Remington Hill. The Steep Hollow, Planet, East New York, Swamp Angel and Golden Bull, which are tunnel claims, are rushed forward by their owners.

PLUMAS.

SUNNYSIDE CO.—*National*, May 29: This company had to shut down work for a short time on account of the scarcity of provisions. The snow was too deep to admit of getting in a new supply.

BUTTERFLY MINES.—These mines are in full blast, and showing up well. They will give a good account of themselves this year.

TUOLUMNE.

NEW ALBANY MINE.—Tuolumne *Independent*, June 5: This is the only mine and works at present in active operation on the North Fork. The present company came into possession of this mine 0 years ago, and have in the meantime constructed one of the best 10-stamp quartz mills in the county and also developed the mine with the most flattering showing for a rich and inexhaustible lode. There is water power, high pressure—something like 300 ft, 2 nozzle and 8-ft hurdy-gurdy wheel. This gives power sufficient to drive a 30-stamp mill. Hoisting works, one and water out of the mine, is also by water power, on the same plan, under pressure of 150 ft. The mine dump is 200 ft from the mill dump. The cars conveying ore to mill are operated by action of gravitation, the loaded car hauling up the empty one. The 800 level, which is tho greatest depth worked, the vein is 8 ft wide, and found to widen out as the works continue downward. In connection with the mine and mill the company own a right to 60 inches of water.

OLSEN MINE.—Jamestown Cor. Tuolumne *Independent*, June 5: Last week I visited Golden City, where the famous Olsen mine is situated. The mine is in operation, with a force of 25 men, at 8-hour shifts. They have the hoisting works over the main shaft completed, with an engine, cage, etc. The shaft is a perpendicular one and down 114 ft. They are not working the main shaft at present, being engaged sinking north and south. The south is down 70 ft, the north 80, and is connected with the main shaft. I believe the company are undecided whether to build their mill down on the river, 4 miles distant, or at the mine; but there being no water at the latter, it will be a drawback to them.

TULARE.

EMPIRE MINE.—Visalia *Delta*, June 4: The hoisting engine for the Empire mine has arrived, and on Thursday was forwarded from Visalia. The tramway of the mine has been repaired, and in a few days will be in good running condition. Snow is all off in the flat, and is fast disappearing from the timber.

ITEM.—Mr. Flemming, late Supt. of the Empire mine, will shortly return to Mineral King for the purpose of prospecting work on his claims near Crystal lake.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—Supt.s' Letters, June 5: West drift, 2300 level, extended 30 ft; total length, 158 ft. North drift, 2400 level, 34 ft; total from the incline, 818 ft. East drift, 2400 level, 34 ft; total, 185 ft.

UTAH.—Main incline 108 ft below the 1950 level; ground very hard. On the 1750 level the southeast drift is now out 510 ft; ground soft.

UNION CON.—On the 2300 level the joint Mexican drill hole from the east crosscut has been extended 80 ft. On the 2400 level No. 2 winze has been sunk and timbered 4 ft. The hoisting engine at the top of this winze is now up and ready to be put in operation. On the 2500 level the northwest drift has been extended 11 ft, and is now being timbered up. The south drift has been extended 16 ft. During the week but 45 tons of ore have been extracted from the 2300 level, and as it has not yet been sent to the mill the average assay is not known.

MEXICAN.—On the 1600 level the joint Ophir east crosscut is being repaired. On the 2300 level are enlarging and timbering the north lateral drift. The joint Ophir winze has been sunk and timbered a distance of 14 ft. The joint Union Con. drill hole from the east crosscut has been extended 80 ft. On the 2500 level the joint Ophir upraise has been extended 22 ft, and the north drift bas been extended 41 ft.

OPHIR.—On the 1000 level are repairing and retimbering the north drift and the joint Mexican crosscut. On the 2100 level the drill hole has been extended 70 ft. On the 2300 level tbe jolnt Mexlean winze has been sunk and timbered 14 ft. On the 2500 level the joint Mexican upraise has been extended 22 ft, and the north drift 16 ft.

CALIFORNIA.—During the week there have been extracted and sent to the mills from the 1500, 1050 and 1750 levels, 360 tons of ore of the assay value of $42.78 per ton.

SOUTH VIRGINIA.—On the 2300 level the south drift has been extended 20 ft. During the week there have been extracted and sent to the mills from the 1050 and 1750 levels, 1,503 tons of ore of the assay value of $58.56 per ton.

YELLOW JACKET.—The south drift, 2828 level, towards the Crown Point mine, has been advanced 52 ft during the past week, making the face of same 96 ft from the shaft. The ground is a mixture of quartz and porphyry and very dry.

BELCHER.—Have started work in the face of north drift, 3000 level, which is now in 124 ft from the incline. Work in the face of south drift, same level, will be commenced to-morrow evening. The car track in both the north and south drifts has been repaired, and some necessary repairs have also been made in the north incline.

BEST & BELCHER.—Letter of the 6th says: For the week ending to-day the joint shaft has been sunk and timbered 35 ft; total depth 1,225 ft. Machinory at shaft is in good working condition.

CROWN POINT.—Letter of the 6th says: East drift, 3000 station, now in 141 ft, having made 42 ft during the week.

GOUGH & CURRY.—Letter of the 6th says: During the past week the joint shaft has been suuk and timbered 35 ft; total depth to date 1,225 ft.

SUTRO TUNNEL.—Report of progress in the north lateral braneh for the week ending June 1st: Number of ft driveu at last report, 3,043; number of ft driven since, 106; total number of ft in branch, 3,140. Report of progress in the south lateral hranch: Number of ft driven at last report, 1,013; numhor of ft driven since, 148; total number of ft in hranch, 1,101. During the month of May the north lateral drift was advanced 321 ft; south hranch 315 ft. In the south branch considerable timbering has heen necessary.

AURORA DISTRICT.

REAL DEL MONTE.—Esmeralda *Herald*, June 5: Tbe main shaft has now a depth of 560 ft, and is being pushed vigorously.

THANKSGIVING MINE.—This mine, recently sold to Eastern capitalists, has resumed work under the new management. A mill site has been purchased and a mill will be erected shortly.

EUREKA DISTRICT.

EUREKA CON.—*Aetna*, June 5: Work on the new 3-compartment shaft of the Eureka Con. is being pushed vigorously. Three 8-hour shifts of picked men have been put on. The shaft is now down 63 ft.

RICHMOND.—Early in the week a cave was struck in the drift running from the 200 level of the Richmond. It is 80 ft long, 40 ft high and 40 ft wide, with ore under and above, but of what grade we have been unable to learn. Another cave, 196 ft long, 30 ft wide and 20 ft high, was discovered in the mine on Friday, in a drift going from No. 14 chamber. There is ore in it and some splendid specimens of crystallized lime. Eleven contracts were let in this mine on the 1st.

MARY ANN.—This mine is on the western slope of Prospect mountain, on the north line of Prospect Mountain tunnel, and shows very rich croppings on the surface. We have seen some specimens of rich chloride taken from the bottom of a new shaft 10 ft from the surface which assays $150.

HOOSAC.—Work on the Hoosac has been suspended until air pipes can be secured and placed in the mine, the ventilation being so bad as to render further progress almost impossible. A body of clay 10 ft thick was passed just before stopping, and quartz encountered beyond it. The stockholders are sanguine that the Hoosac will again become a large bullion-producing mine.

MINING NOTES.—A seam of ore assaying $500 has been exposed on the surface of the Silver Stato mine, on McCoy hill, and can be traced for over 200 ft. A quautity of high-grade ore is on the dump of the Original Baltie awa ting shipment. Recent assays from this mine have run as high as $345.

ALTONA.—Robert Young and partners have struck a bonanza in the Altona, and have made several shipments to the Eureka Con. reduction works this week. The breast of ore is 20 ft wide, and works $104.74 and $30.92 in silver, and $67.32 in gold.

IDAHO CON.—The 2-compartment shaft on the Idaho Con. is down 180 ft, the bottom of the shaft being in very favorable ground. The shaft will be sunk to a depth of 200 ft, when connection will be made with the ore body found at the end of the main incline.

ITEMS.—The lessees of the Macon City have 50 tons of ore sacked up ready for shipment. The ore found in the Paul Pry a week ago has opened out to a width of 3 ft. A very favorable change took place in the face of Eureka tunnel on Monday night, and the contractors are making good headway. The tunnel is now in over 1,300 ft. Peter Peterson is shipping ore from the Good Hope, on Adams hill.

NEWARK DISTRICT.

MINING NOTES.—Some 20 men are at work in the Bay State mine. Within the past 3 months this mine has produced $86,000, and they have a fine body of ore on the 75 level. At the Battery mine, owned by R. Sadler, 9 men are at work, and they have struck a vein of ore 2 ft thick, which gives promise of a large ore body opening out. Mr. A. Dewitt is doing assessment work on the Dewitt tunnel and Uncle Sam mine.

PHILADELPHIA DISTRICT.

BELMONT MINE.—*Courier*, May 29: From superintendent's letter of the 27th: All parts of the mine now being prospected show a marked improvement since last writing you. Our drift started north from the upraise 100 ft north of shaft, between 200 and 300 levels, is showing 8 to 12 inches fine milling ore, and as there is a block of unprospected ground between these levels, about 150 ft in length by 100 ft in depth, I do believe we will open up a fine body of ore.

OTHER MINES.—We understand that one or two companies owning mines in Philadelphia district are making arrangements to start up work again shortly. There are good mines in this district that would pay well if the owners worked them properly.

REESE RIVER DISTRICT.

MANHATTAN M. CO.—Letter of the 4th: For the week ending this morning, the mill has reduced 121 tons, 1,010 lbs of ore, assay value of $27,610.59. Of this amount $6,124.94 was from custom ore; $8,043.33 from tribute ores; and $13,442.32 from the Curtis shaft. During the month of May the mill reduced 541 tons of the assay value of $131,070.91. Of this amount, $27,534.85 was from custom ores; $12,663.10 from tribute ores; $82,021.33 from the Curtis shaft; and $7,900.54 from the Frost shaft.

SILVER CANYON DISTRICT.

SADIE L MINE.—Ward *Reflex*, May 29: We learn from parties just from Silver Canyon that the Sadie L has been sunk on 100 ft, and a vein 20 ft in width has been exposed. About 12 ft of the vein, it is thought, will go $150 to the ton. Assays going as high as $2,000 have been obtained from this portion of the vein. The mine, we understand, has been bonded to Eastern people for $18,000. Assessment work is being done on a number of claims in the district. The southern extension of the Sadie L carries in the main chloride ores of a high grade wherever it has been touched. No attempt has yet been made to sink upon it.

BUCKHORN.—This claim crops out boldly 3 or 4 ft above the surface, and [assays from the croppings go $400 and over. This ledge was not worked last winter on account of the deepsnow. The ores are free milling, and it will not be difficult to work them up to 90%. A mill will be put up this summer, and the real worth of the mines of Silver Canyon will then be more practically demonstrated.

SPANISH BELT DISTRICT.

BARCELONA.—The ore in the north drift continues of the samo rich character as the work progresses. This company could now keep a 20-stamp mill running steadily on ore from their mine. Spanish Belt district will be the scene of much activity this coming summer.

WHITE PINE DISTRICT.

WARD BEECHER, ETC.—*News*, June 3: On Monday last Mr. W. B. Bourne, of tbe Ward Beecher Con. mino, on Treasure hill, accompanied by Col. Joseph Fulton, of San Francisco, and Mr. M. Provine, of Grass Valley, Cal., arrived, and have since been engaged in examining the Ward Beecher, Hidden Treasure and Mammoth mines, all of which are principally owned by Mr. B. Work will be resumed on the Ward Beecher to-day, under the superintendence of Col. F. Two shifts of men will be employed sinking the shaft, and the mine will be thoroughly opened. It is kuown that there is a large body of good milling ore in the Ward Beeeher, which will pay to work. Mr. P. is an experienced mill man, and will remain here to put the Manhattan and Big Smokey mills in good working order, and take entire charge of them. These latter are also the property of the company. Col. F. will superintend the mines. We are glad to see work resumed on the Ward Beecher, and hope that the Hidden Treasure will also be started up soon. The Mammoth mine is said to contain, already exposed, a vast amount of $30 and $35 ore, which, we understand, Mr. P. believes will pay to mill.

EBERHARDT & AURORA.—Work is being steadily prosecuted on the prospecting drift in the Eberhardt & Aurora tunnel, and the prospects are more than favorable.

WILLOW CREEK DISTRICT.

PAYMASTER MINE.—Cor. Eureka *Sentinel*, June 1: A note from Willow Creek informs us that tbe new mining discovery recently made at that place, and heretofore alluded to in these columns, is named the Paymaster. The locators are H. H. McColly, Mr. Street, Wm. Reardon, James Edwards and J. H. McAllister. The ledge is about 10 ft wide and the ore resembles that of the Ohio mine in the same district.

ARIZONA.

TOMBSTONE DISTRICT.—*Epitaph*, May 29: Work on the Head Center mine goes on steadily and with floe results. The main shaft is 265 ft deep, and is sinking at the rate of 2 ft daily. On the 132 level a crosscut has been run 50 ft, all in vein matter, over 30 ft being in good ore. On this same level a drift has been run 57 ft south. On the 210 level the south drift is in 100 ft. Ore from this mine carries a great deal of free gold, and some beautiful specimens of this character of rock have been taken out. Chlorides are found in abundance and give high assays. The results so far show a yield of about ¼ gold.

GRAND CENTRAL.—The new wire rope has arrived, and the second reel of the hoister was set in operation, and both are running constantly. Already the main shaft is down 240 ft, where a station will be made for the 4th level. On the south end of the claim, 1,200 ft from the main shaft, is the new prospect shaft which, at the time of our last report, was down 40 ft with a 40-ft drift following the vein north toward the main shaft. This drift is now in 147 ft, following a vein of very handsome ore the entire distance, which averages 2 ft in width. About 100 tons of this high-grade ore are already on the dump.

GLOBE DISTRICT.—*Silver Belt*, May 29: Mr. Keeler has shown us a most beautiful collection of ore from the Shakespeare and Quaker mines, owned by Keeler, Read and others. The Quaker is 10 ft wide, showing at the depth of 10 ft, where the vein is cut, a pay streak of from 5 to 0 ft, carrying both gold and silver, which, collectively, averages about $70 per ton. The Shakespeare is also a large vein, showing an average cropping from 3 to 8 ft wide.

MINING ITEMS.—The news from the Silver Nugget is very encouraging, the rich ore bodies growing in width as depth is attained. Also the Mack Morris is retaining its good name for richness and quantity of ore.

LOST GULCH.—This gulch is destined to become the center of gold mining operations, not a week passes but that propertica located in that belt change hands.

SANTA RITAS DISTRICT.—Tucson *Citizen*, May 31: Mr. Samuel Katzenstein, who arrived in town on Saturday, gives a fine report of mining matters in this district. He says the whole country for 5 to 10 miles around is full of mineral, and the rock is of a very high grade.

SHAMROCK MINE.—Mr. Katzenstein has sunk on the vein of the Shamrock to the depth of 40 ft, and it is believed that the rock, which is a carbonate and Chloride ore, will work up to $60 or $65 per ton.

QUEBEC AND YUBA.—The Quebec mine, owned by P. M. Hilton, shipped 2 tons of tbe ore to San Francisco for milling. Mr. H. shipped 2 tons of ore from snother of his claims, the Yuba, and was rewarded by the handsome return of $478.06 per ton. On this claim he has sunk about 10 ft, and has a vein about 18 inches wide. He will continue the shipment of ore to San Francisco until the custom mill at Charleston comiences work.

COLORADO.

GOLD AT LEADVILLE.—Denver *Tribune*, June 2: In a recent interview with the editor of the *Circular* on "Leadville as a Gold Camp," Manager Daly said: We have had a partial clesu-up in the Colorado Prince, and I thiuk I can see that we can get out, at a cost of about $7 for mining and milling, about 30 tons of ore per day, which will be worth about $20 per ton. I find that all through Breece hill, from the Evans to California gulch, the rock underlying the iron carbonate deposit is quartzite, seamed with fissures, most of which carries gold in large quantities. This is plainly shown in the south end of the Colorado Prince, in the Miner Boy, on the Black Prince, and in the Great Hope, on the north bench of Breece hill. It is my opiniou that all mines on this belt will, at a sufficient depth, enter the same gold-bearing formation.

LARGE ORE SHIPMENT.—The largest ore shipment ever made by a Leadville company in a single day was by the Little Chief, on Sunday last. It has been stated as 270 tons, but the official figures from the Grant smelting company show it to have been 281 toos, 440 lbs.

CENTRAL CITY ITEMS.—*Register-Call*, June 4: Col. P. R. Smith has purchased the stamps, batteries, shafting, etc., formerly used in the Hardesty mine in Nevada, and will erect a 25-stamp mill, as also concentration in North Clear creek immediately below the Dallas mine. Mr. Wain, of the Empire mill, in Black Hawk, crushed a lot of mill ore from No. 11, Gregory lode, property of the Naragansett Co., which yielded 6 ounces gold per cord. An assay of ore from the Robert E. Lee mine on Hamlin mountain, made by Prof. Goodale of the Boston & Colorado smelting works, gave a showing of 359 ounces silver per ton.

IDAHO.

SHAW'S MOUNTAIN.—Boise City *Statesman*, June 3: From Mr. A. L. Rucarson, who was over on Shaw's mountain mines last Tuesday, we learn that the Plowman mill is now running and crushing about 18 tons per 24 hours. There are about 130 tons of ore at the mill ready for crushing. Besides this there is a large amount of ore on the dumps at the mines ready to be hauled to the mill as soon as the roads will permit. There is certain promiso of abundant water this season to run the mill, and from present indications there will be no lack of ore from the mines.

YANKEE FORK.—*Herald*, May 29: Developments are prosecuted on the Unknown with very flattering results. In the present workings the vein is 20 ft wide, of excellent milling ore.

LUCKY BOY.—The shaft on this mine is now 69 ft deep. So far as opened the vein is very solid, and during the past month 20 tons of ore, the assay value of which is from $450 to $500, have been taken out. The shaft is going down at the rate of 6 ft a week. About 180 ft west from this point another shaft 5x8 ft was started down on the hanging wall.

NEW MEXICO.

GRANITE GAP DISTRICT.—Cor. *Grant County Herald*, May 29: This newly-formed mining district adjoins the San Simon. The Granite Gap mine has a shaft 50 ft deep, out of which 18 tons of ore have been taken, yielding by assay at the rate of 16 ounces per ton. The ledge is from 3 to 6 ft wide. Indian troubles have stopped work.

WHITE OAKS MINES.—Las Vegas *Gazette*, May 29: Yesterday was received the first shipment of bullion from the White Oaks mines. It consisted of $600, the result of the clean-up of an arastra run on Homestake ore. There was but 1,500 lbs of ore put into the arastra, and $600 was the result. The arastra was hastily and imperfectly constructed, and a good portion of the rock was not ground up at all, but resnlt is ample and sufficiently satisfactory.

UTAH.

MINING PROSPECTS AT OGDEN.—Cor. Salt Lake *Tribune* May 28: While very light prospecting has been done by many individuals, none or but little vigurous work has been commenced until very recently. Two companies are putting arastras to work, and will within the next few days have them in operation upon ores that at the surface give good returns. Each of these companies has a roaster also. Ore is being taken out of other claims preparatory to shipping to smelters for reduction, that the full value of the claims may be fully computed. The want of capital has caused good claims to lie dormant. Judge Brewster lately organized the Ogden C. D. C. with a capital stock of $1,000,000 in shares of $10 each. James C. Thomas is Pres. and John H. Avery Sec'y and Tres., and Chicago, Illinois, is the headquarters of the company. Eight claims of 600x1,500 are owned by the company, and the property lies between Taylor and Waterfall canyons, and within three miles of the depots of Ogden City.

ALTA DISTRICT NOTES.—*Daily Tribune*, May 27: The Madelon has 12 men running a tunnel and sinking a shaft. Tho Emma, leased by a hand of six, is taking out some rich ore. Litigation over this famous property has started out afresh. The Vallejo has a force of about 15 men. They are engaged in driving a tunnel and shipments are suspended for the present. The Bay City, or, as it is now known, the American Emma, is worked by a force of six men. They will he helped by an additional force as soon as the machiuery is placed.

Protection of Plants Useful to Man.

[By W. N. Lockington.]

Plant life, like animal life, has to struggle for existence. The young plent may bs choked by other species, or crowded out by rivals of its own kind, even though the atmosphere, soil and position are wsll suited to its growth.

Men sows the seads and gathers the crops of such plants as he desires, yet he has hitherto failed to protect them adequatsly, especially in ths pastures upon which he chiefly depends for the food of his domestic cattle, against rival aggressive species of plants. If, in this respect, hs has not done all that he could do, he hes still more signally feiled to protsct his crops against the attack of destructive animals, more especially of insects. That he cen do much towerd this end, if he uses his intslligence intelligently, will, I think, be evident after a little consideration, which, with both plents and animals, may be divided into—

1. Protsction against man's waste and wanton dsstruction.
2. Protection during the season of reproduction.
3. Protection against rival plents.
4. Protection against animal enemies.

First—The forest areas are gradually diminishing throughout the world, and man is, in most cases, the direct cause of ths diminution. A country without trees is arid, unfit for men's hebitation. Man's own acts have thus rendered nninbabitable vast tracts that once were celshrated for their fertility.

In the words of F. L. Oswald, M. D. ("Popular Sciencs Monthly", August, 1877): "Since the advent of the Christian religion, the physical history of our planet records the steedy growth of a dessrt, which mads its first appearence on the dry tahle land of southern Syria, and gradually spreading eastward down the Euphrates toward Afghanistan and westward along hoth shores of the Mediterranean, now extsnds from eastern Persia to the western extremity of Portugal, and sends its harbingers into sonthern France and the southeastern provinces of European Russia. Like a virulent cancer, the azoic sand-drifts of the Moab desert heve eaten their way into southern Europe and northern Africa, and dried up the life springs of districts which, hsyond all dispute, wers once the garden regions of this eerth.

"The Mediterransan ssa, once a forest lake of paredise, is now a Deed sea, surrounded by dusty and burning coasts, often for hundreds of miles without a vestige of organic life."

Ths highlands of Persia and Parthia, once the homss of conquering races who preceded Rome in empire, and successfully repelled her armies, ere now the homes of famine and misery. The once fertile plains of Mesopotamie and Chaldæa ars en alluvial desert; Asia Minor, itself once the seat of powerful empires, a tresless rgion of rocks and ruins; north Africa, the granery of Rome, a sterile dessrt; and even southern Italy, Greecs and Spain only retain a shadow of their former hsauty or of their formsr population. Ths prsponderances of population of Italy and Spain has been transferred to the northern portion of those countries, and Greeks exist chiefly by virtue of their commercial and maritime tendencies.

Champollion, who traced the course of former rivers and brooks, and found tree-stumps upon the plateau of Sidi-Belbez, in the center of the Sahara, exclaims: "This dessrt may oncs have been a region of groves and fountains, and the ahode of happy millions. Is there any crims against Nature which draws down a more terrible curss than that of stripping our Mother Earth of her sylvan covsring? *** Earth was Eden once, and our missry is the punishment of our sins against the world of plants. The burning sun of ths desert is the angsl with the flaming sword who stands between us and paradiss."

Evsn mors northsrn countries ars not innocsnt of tree-slaughter. "Cut down ths trees; every tree shadee enough ground to grow so much wheat," was the doctrine of agricultural writers in England a few yeare ago, and the pernicious advice was largely followed hy the cutting down of hedges, hedge-row trees, and coppices. Southern England has long been denuded, but has now heen partially replanted. The actual need of timber prompted action.

In many parts of the United States, recent as is its settlement, clearing has proceeded too far. The central portions of Ohio, parts of Kentucky and Michigan, and, to a still greater extent, the cotton growing States of Missiesippi, Alabama, Georgia and South Carolina, are becoming arid, and drouths are frequent.

Is it not time, then, to stay the destroying hand, and to foster what we have destroyed? How long will it be before the redwood forests of the coast range of California cease to exiet, and the curse of fallenness fall on the fertile valleys of the coast range?

Let man, in all regions where the forest areas are not eo large as to prevent settlement, leave all the trees above the cultivable line upon the hillsides, and patches in the valleys, hesidee those about watsr-courses, eprings, and huildings. Let him plant the already denuded regions, and henceforth, before he cnt down a tree, let him consider well whether it can he epared, remembsring that what he can cut down in a few hours takes perhaps hundreds of years to grow.

While trees muet be cut down for timber, it is a shame to cut down for firewood any good tree that can he spared. Lopped off limbs, trees that are too crowded, or are deformed, and the hranches of trees cut down for other purposes, should he our sources of firewood.

As man increases in numhers, and as the higher races sattle in the neighhorhood of the immense forest regions of Equetorial America, Asia and Africa, some tree-slaughter must take place to make room for agriculture. If this is done in the same indiscriminate way that has heen followed in the earlier homes of thsss races, not only will many interesting species become extinct, but many trees which yield valuahle gums, resins, fihers, timber, and nuts and fruit, will become scarce or even extinct before their cultivation has extended sufficiently to compensate for the absencs of the uncultivated plants.

Unless some check is put by the growth of reason, enforced npon the unreasoning in the form of a law they must obey, the reign of sterility will ultimately be extended even over the wide-watered lowlands of the Amazons, and the whole earth will he by men's hands converted into a vast Sahara. Nor is waste confined to the "clearing" process. Trees are felled for timher that might with advantage be left to grow, and are killed to procure their resinous or other products, when tapping would answer the purpose as well. These are criminal acts; they ars in direct contravention of Nature's laws, and shonld bs equally so of human laws. In pursuancs of their own selfish ends, individuals thus enrich themselves at the expense of a community which as yet is not sufficiently alive to its interests to visit the crime with fine or imprisonment.

Sscond—Men protects the food-plants that are under his immediate care during the season in which they mature thsir seed; he gathers thoss seeds end preserves a portion for future crops. Tbere are many cases in which he would do well to extend his care to ussful plants and trees which, though like fishes among animals, they ars undomesticated, yet supply him with food or materials of soms kind. Meny a valuahls tree or plant, now comparatively scarcs, might bs rendered abundant by the careful preservation of the fruit whenever accessible to men; and by the transplentation of young trees and saplings from locetions where they are certain to be crowded out by the oldar plants around, to places where thsy cen be sure of light and air and space in which to grow. In this way, without actual cultivation within enclosed fields, man can bring his powsr to the assistance of Nature, to the end that he may still continue to maintain his plac in Nature.

Third—Man takes care of his cereals and rootplants, preserving their seed, prsparing the ground for them, and to a great extent destroying the rival plants that encroech upon their domain. But in pasture lands, whether such are sown by man, or untouched by the plow, hs to a great extent leaves ths useful plants to struggle for existencs as best they can.

In the meadows and uplands of such an old settled country as England some care is taken; but in newly settled countries like ours the agricultural population allows "weeds" of various kinds to extend themselves over the fields, and then wonders where they came from.

If the fight were fair and all things left as they were before ths advent of civilized man, the useful species might, in many instances, prevail; but in fields cropped hy sheep, cattls or horses the fight is not fair. The grassss and edihle plants are eaten off close, and have no chance to mature their seed, while evsry dock, thistle, nettle, ranuuculus or other inedibls or poisonous plant safely grows and, undisturhedly, ripens and sheds its seeds. Who then, possessed of common sense, need wonder at the prevalence throughout this new country of such introduced weeds as the stinking mayweed (*Maruta cotula*), the spurvey (*Spergula arvensis*), the Spanish thistle (*Centaurea solstitialis*), ths blessed thistle (*Silybum marianum*), the wild mustard (*Brassica nigra*), or many others. Who, under such circumstances, need wonder than in autumn the fields of California are a mass of compositæ, mostly untouched hy animals—a mase among which the various species of "tarweeds" (*Madlia sativa* and others) are most conspicuous.

The myriad seeds of these weeds cannot be confined to the pasturee. They invade grain fields and gardens, vineyarde and orchards, and, backed by the vast reserve country over which their reign is estabiished, often successfully hid defiance to the farmer by flourishing amid his most precious crops and under his windows.

The only remedy is intelligent industry, and the misfortune of man's social habits is, in this as in other matters, that any industrioue man must euffer somewhat if his neighbors are idle. He may mow down his thistles, mayweed, tarweed, mallow, etc., before they can seed, but unlese his neighbore do the like, he must he on the watch againet a perpetual invasion.

The disappearance of many native plants before the inroade of others, hrought by colonists, has been remarked wherever the European has settled. He hrings his cereals, and with them cannot avoid bringing the seeds of the common wild plants of Europe.

These have already been through the ordeal of adaptation, and have conquered. They are the victors of a long strife which has resulted in the total extinction of some wild species, and the banishment of others to out-of-the-way cornere. They have held their own against man in hie own domain, and some have even learned to grow on the patbs he treads.

In a new country, in competition with a hitherto undisturbed flora, with plants that have for ages sattled ths balance of power among themselves, the emigrant plants, like the emigrant people, have it all their own way, especially at first; hut just as in time a remnant of a nativs race of men recovers itself, fits itself to the new conditions, and again becomes prominent—as ths Indian has in Mexico, Chile and Peru—so is it with some among the invaded plants.

It is noticeahle that in Celifornia most of the native plants that hold their own, or increase and become pssts to man, are of the composite order. The compositæ are the most specialized of plants, and, so far from being created for man's use, are evidently adapted to live in spits of him. Few of them are of any use to him; few furnish food to his domesticated animals. Thus they remain uneaten, and scatter hroadcast seeds which—each enclosed in a separate seed vessel and separately stuck upon a recsptacle—are sure of a considerahly wide dispersion, and which, moreover, are in many cases provided with a downy crown or pappus, hy the aid of which they are horne by the hreeze afar from ths parsnt plant.

But man's efforts towards the destruction, or at least diminution in numbers, of hurtful plants, must not he limited to his fields. If the world is to be really turned to his use, he must commence at once to cleer away undergrowth from his timber trees, and to judiciously thin out ths crowded trees in his plantations. There are many feral species which, though they do not injure his crops, injure useful trees, and against the too great prevalence of these man will ultimately have to teke preventive measures.

Hitherto only flowering plents have been spoken of as enemies to other plants; but thers is a tribs of vegetahls organisms whose raveges are more secrst and more difficult to dsal with, viz., ths fungi. The higher fungi might bs made to furnish much additional good food to man, but the lower arc his deadly enemies. Under such names as smut, bunt, rust, ergot, they attack our cereals; as hlack moulds they destroy foliage; as hlue monlds they feed on bread, cheese, preserves, fruits, etc. Nothing is safe from them. The air swarms with their spores, waiting only for a suitable combination of temperature, moisture and habitat to burst into fungoid life. The spores of a singls fungus may run into the billions. If thsy all were to fructify, the world would at oncs he covered with fungi, and ell things else would dis. But fungi can only live in a suitable nidus, and eacb species attacks some particuler plant or animal, or a certain series of plents or animels, and lives on no other. A very large proportion of ths spores remain unfertilized, for the arrangements for fertilization are uncertain. Besides this a peculier blending of heat and moisture is required for the development of fungoid spores, even when the pehulum they require is plsntiful.

Thanks to these limitations, fungi have not yet dsstroyed the higher orgsnisms; or rather, nature has provided the fungi with an almost incalculehle fecundity that they may continue to exist under such conditions.

At present man can do but little against tbese subtle enemies. A field of wheat may be ruined in one night with rust; in a few hours the labor of months may go. The potato-rot is a fungus, so is the grape-mildew, and so are all these mildsws and hlights which still are deemed by many mysterious dispensations of providence.

Stamping ont by ths thorough destruction of the plants they have attacked, is ths surest cure known, it is costly, but less so than the unchecked spread of the fungus. Various chemical suhstances have also becn tried with variable success; but, as said before, man has yet much to learn before he can greatly keep down the numbers of the microscopic germs of such fungi as feed on living plants.

Fourth—The present geological period is often styled "the age of man," and ths tertiary period "the age of mammals"—to distinguish them from the preceding psriods in ths strata of which reptilss and fishes ars ths predominating forms.

But, though the mammalia as a class dominate over all the other vertehrata, both on the land and in the ocean, and though man, to a considerahle extent, dominates over the other mammals, it cannot yet be said that either man or any of the lower vertehrata have acquired full dominion over certain forms of the invertebrata.

Parasitic forms of the most varied structure dwell within, or live at the expense of, the higher animals. Tape worms, round worms, thread worms, flukes, torture the lives of heast and bird, reptile and fish; nor do they spare the invertebrata. Crustacea, of low degree, inhabit all accessible outside and inside parts of marine animals, and on the land insects are even more aggressive in their attempts on plants and animals. Indeed so abundant, eo omnipresent, is insect life on the land and in the air, so countless are insect forms, and so wonderful the metamorphosee which they pase through, and the adaptations by which they gain access to their victims, that the present period may fairly be called the age of insects. Even man is not exempt from the attacks of many, while his lordly frame furnishes food to others. These direct enemies are sufficiently annoying, but they are as nothing to the indirect ones which attack the plante he uses for food.

Beetle and moth-larvæ in growing trees, eating them into dust and riddling them with tortuous gallerice; "grubs," chiefly of beetles, but often of other orders, in fruits and nuts and seeds; gall insects on leaves and twigs—all these pursus slowly, unohtrusively, relentlessly their work of destruction, hiddeu from the sight of man until the evil is done. The foliage of man's cherished gardsn trses, of his fruit trees and choica exotics, and worse still, of the crops upon which he depends for sustenancs, is destroyed before his eyes by a countless host of caterpillars which he is powerless to kill. The scale-insects (*Coccidæ*) and "smother flies," or aphides, cover the stems, leaves and flowers, aliks of his roses and of his cauliflowers, his green-house darlings and his kitchen herbs.

In his endeavors to destroy thess pssts he is often worsted; at other times conquers only by the sacrifice of his crops or trees, lest the plague should spread. Tiny acarids, as the phylloxera, atteck his vines, and ths vintege is lost. Bsfore thess enemies he has too often stood helpless—helpless through ignorance.

But so great have been insect ravages, so widespread the misery wrought by them, that, in a few instances, governments have employed investigators to search a cure. The phylloxera in Francs, the grasshopper in the United States, forced recognition of their importance as chacks upon humen lifs, and commissions were appointed, which have already done great servics.

By a study of ths life history of eech hurtful spscies, it is usually found that there ars other species which feed upon it, end which should, therefore, be encouraged. Also, that at some period in their lives they can be more readily destroyed than at others; or tbat diffsrent methods of destruction are most efficient at different periods of their lives.

Some idea of ths methods to he pursued may bs ohtained by the enumeration of thoss recommended for ths destruction of ths Rocky Mountain locust by Messrs. Riley, Packard and Thomas in their report for the year 1877.

These methods may be divided into (1) encouragsment of natural agencies, (2) dsstruction of the eggs, (3) destruction of young or unfledged insscts, (4) destruction of the mature or winged insects, (5) preventive measures.

The first is ensured hy, as far as is possihls, assisting the multiplication of the various insect ensmies of the locust, such as the *Anthomyia* fly, which lays its eggs within ths locust eggs; the flesh fly, which does the same; various ground beetles, blister-beetles and soldier-beetles, which usually, while in the larva stegs, eat the locust sggs; the locust mits (*Trombidium locustarum*), which destroys hoth eggs and adults, fastening itself under the wings of the latter and sucking them dry; various *Carabidæ* and *Cicindelidæ* among beetles, and *Asilus* and *Tachina* among flies, all of which prey upon the edult locust, and also by fostering such birds as prey upon them. Bleckhirds, robins, prairie-chicken, quail, lerks, poultry, turkeys and crows all aid in the work of destruction, and should bs fostered hy man for the purpose in infested districts.

Harrowing in the autumn, plowing under and irrigation are mentioned as methods of destroying the eggs. Ths larvæ can bs killed by burning the grass, by mechines carrying an open-grate with a fire of pitch-pins, covered hy a metal-sheet to force the heat downward; by locust-crushers of various descriptions; hy trapping in nets, pits with winged fences, digging and trenching; by coal-oil and coal-tar, which act as a poison, the former being the more ussful; and hy catching and bagging in machines of various kinds.

In Missouri and Minnesota bounties are paid for destruction of grasshopper eggs and young. In Kansas and Nebraska a certain amount of forced labor is enjoined. The breeding-grounds are known, and on them the fight cau bs most advantageously carried on, but something can hs done even against the winged swarms, by the simultaneous combustion of largs quantities of straw and other matters, producing clouds of smoke.

When the whole courss of life of the dsstroysrs of apple and plum, and pea and bean, of wheat, cotton, maize, and every other product man considers his own, is known to those who cultivate the soil, thers is no question that their ravages can be greatly reduced.

In the dcstruction of insects, birde play the most important part, but some, unfortunately, are themselves vegetable-feeders, while others subsist on a mixed diet. Man has too often, indiscriminately, slaughtered his avian friends in mistake for enemies. The truth is that the great majority of birds do man far more good hy their destruction of insect life than mischief hy devonring his crops, although there are occasions when the latter need protection from them.

The English sparrow—a finch, and, therefore, principally a seed-eater—wae an unfortunate introduction to the United States.

Whcn it is remembered that the chinch-bug in one year caused a money loss of $73,000,000 in Illinois; that the annual loss from the cotton-worm is from $25,000,000 to $50,000,000; and that in 1874 the Rocky Mountain locust caused a loss of nearly $50,000,000, it hecomes evident that the suppression of these insects is equivalent to a great expansion of production, and, therefore, of human life.

Among the domesticated animals are some which, brought from the desert, and accustomed to live upon the few dry herhs of an arid region, have made a desert of the lands where they have been introduced. Such are the camel and the goat—browsers by nature—killing young trees in prefereuce to eating grass, and thus doing incalculable mischief.

The sheep, except in localities covered with

chaparral, is far preferable to the goat; and it is devoutly to be hoped that the range of the camel will never be extended, and that its threatened introduction in California will not take place.

European Influence on American Currency.

One of the strangest spectacles of modern times is that of a great country, known throughout the civilized world by the products of her skill and industry and the aggressive and tireless enterprise of her inhabitants—a country that has made her influence felt in every trade-center of the world, and can control the prices of production everywhere—meekly asking every morning of the money loaners of a city 3,000 miles away, and on the other side of the ocean, what her own coins are worth, the ore for which was dug out of her own mines, and stamped with the seal and pledge of her government.

Here is a country with inexhaustible stores of precious metals, easily mined, that are needed to develop the untouched resources of its broad prairies and teeming forests, practically locking up its vast treasures, and allowing its broad expanse of territory to lie unimproved, for no object in the world but the benefit of the money lenders in Europe and their agents here. Many papers are in the habit of quoting the price of silver in London, with the remark that this makes our dollars worth 87 or 97, or some other number of cents. Our country is in a position to-day to state, and her people to demand, the fact that here an American dollar is worth a dollar, whether the price of silver among the brokers of London be more or less. The best interest of our country imperatively demands that the money it may need should come out of our mines instead of the coffers of the money lenders of Europe. The interest that we have paid them would have peopled our territories, built railroads and schoolhouses, and covered our wildernesses and plains with cities and towns and manufactories, and made us the producing nation of the world. The future greatness of our people and nation depends largely upon the wisdom of its legislators and financiers in regard to the great question of mining. The bleeding artery of interest money that enriches the old country so that they are fattened as upon blood, and impoverishes us, can be closed by a proper encouragement of our mining industries. Our own mines can supply us with all the money that the industries of the country require. The mineral deposits already discovered are sufficient to guarantee a supply of precious metal for more than one generation, and we have as yet by no means begun to comprehend the extent of our mineral resources. The individual or nation is most unwise and foolish that borrows money and pays interest when they have in their possession resources that would bring the money and save the interest. The spectacle is presented to the world to-day of a great nation locking up her own treasures of gold and silver and precious metals, and paying interest for the gold.

Our people are patient and long-suffering, but we shall be surprised if there is not soon sent a petition that must be heard from the mining interest, against the injustice of a legislation, or want of legislation, that is doing it a positive injury. When that voice comes it will demand attention and action, for mining has almost in a day become an interest vast and important.—*Chicago Mining Review.*

The Dangers of Tunnel Driving.—The disease and mortality among the laborers in the St. Gothard tunnel has been excessive. The distance between the entrance to the tunnel and the places where the perforatore were at work, which was nearly five miles on the north side, coupled with the frequent freezing of the compressers, rendered ventilation extremely difficult; and the air was further fouled by frequent explosions of dynamite, the smoke of some 500 oil lamps, and the exhalations of 400 men and horses, working in a temperature of 80° to 95°. The horses, although working only eight hours in the twenty-four, died at the rate of 25% per month, often dropping down suddenly in their tracks, as though shot dead. The men died in large numbers of a disease called tunnel trichinoses, from the presence of an entozoon in the intestines. Three or four months' labor in the tunnel brought on the disease, and twelve months generally made the laborer a confirmed invalid, even if he survived. The symptoms were yellowness of skin, features drawn, eyes half closed, lips discolored, skin humid and gait difficult. Even when the food was taken with appetite it would not digest, and wine was invariably rejected. The Italian doctors pronounced the tunnel "a veritable hell."—*Engineering and Mining Journal.*

Mining Prospects in Idaho.—This year, says the *Idaho Statesman*, promises to be unequaled in the history of stampedes. Residents of the country have long been familiar with the extent and importance of her placer mines. Fabulously rich ores have been encountered in different localities in Ada, Alturas, Owyee, Washington and Lemhi counties, and their extraction and reduction cannot long be deferred. Here in the heart of the Territory, surrounded on all sides by grazing and farming lands, are 20,000 square miles of mineral country, the treasures of which await only an influx of prospectors and capitalists to be made available to the nation.

Useful Information.

Signaling Instruction.

Many of our readers no doubt have often seen United States officers, surveyors and others signaling or talking together at a distance by the waving of small flags. Telegraphs and telephones are well enough in their place, as when we wish to converse often over any given place; but on shipboard, or in the field, at a distance from those conveniences, we need some other device. No sailor ignorant of the ordinary signal code should be allowed to go to sea in any capacity of command. Signaling should be taught in all our schools. We give below, for the benefit and instruction of the curious, the alphabet and system in use by the U. S. army, which is claimed to be superior to any other.

The second columns are the equivalents for which the corresponding letters may serve as contractions. With four of any two kinds of things, fixed signaling can be done. Calling one's right side one, and his left side two, he can transmit any message by waving a handkerchief according to the following table:

Letters.	Word Equivalent.	Signal Number.	Letters.	Word Equivalent.	Signal Number.
A	after	22	P	put	1212
B	before	2112	Q R S	quiet	1211
C	can	121	T	are	211
D	did	222	U	station	212
E	of the	12	V	the	2
F	for the	2221	W	you	112
G	ground	2211	X	very	1222
H	have	122	Y	wood	1121
I	if the	1	Z	next	2122
J		1122	&	why	111
K	o'clock	2121	ing		2222
L		221	tion		1111
M		1221			2212
N	not	11			1112
O	of	21			

If we have four apples and four oranges, and we designate the apples ones, and the oranges twos, with them then we can spell out anything. Thus to spell the word *system* we would from our right to left (so that they may come in regular order for the reader) first place an orange, then an apple, then an orange (=212=S); after withdrawing the S place an apple, an apple, and an apple (=111=Y); next repeat the S (an orange, an apple, an orange), next place an orange (=2=T), next an apple and orange (=12=E), and last an apple, an orange, an orange, an apple (=1221=M).

With a small flag a sweep to the left, two to the right, and one to the left would spell *be*. A great many contractions can be made and are introduced in the code.

Refining Spelter by a New Process.—We have lately been shown a sample of spelter, save the *Iron Age*, showing unusual sharpness of crystallization and brilliancy of fracture, which is said to be as nearly chemically pure as the metal can be made. It was made from common spelter, under a process patented by Mr. A. Harnikel, 83 Maiden Lane, New York. We also have a piece of sheet zinc rolled from it cold, which exhibits great ductility and unusual toughness. We are informed that the specific gravity of the new spelter is 7.2, and that its resistance to dilute sulphuric acid is many times greater than that of any grade of this metal hitherto experimented with. For fine brass, cartridges, German silver and artistic castings, we should presume it would have great utility. The price ranges from eight and a half to nine cents.

India-rubber Hose for High Steam Pressure.—At a late meeting of the Edinburgh Association of Science and Arts, held recently, a short communication was made by Mr. Wm. Firth on the use of india-rubber hose for steam and high-pressure purposes. He exhibited a piece of canvas and rubber hose capable of withstanding a pressure of 4,000 pounds to the square inch, and also several other pieces of canvas and rubber packing, which, he said, were most useful for engineers.

Restoring the Black Color of Cloth.—It is a very common and easy practice to restore faded black colors by simply brushing them over in succession, first with a solution of logwood extract, and then a weak solution of bichromate of potash. Another way is to take first a decoction of crushed nutgalls, and then a solution of sulphate of iron. In either case the black color is easily restored by a brush or sponge. We prefer a stiff brush.

A Light Locomotive.—H. K. Porter & Co., of New York, have completed a locomotive which is said to be the lightest ever made for actual service. The cylinders are but six inches in diameter. It is to haul ore, on a 20-inch track, from the mines of Friedenstraw & Co., of Arizona. Its capacity on a level track is 150 tons.

Phosphoresoence.—A tube of "Canton's phosphorus," or sulphide of calcium, prepared more than a century ago, is found to be still capable of phosphorescence. As it is to this substance that the phosphorescent properties of the new luminous paints are due, the durability of the latter seem to be thus assured.

An all Important Screw.

The identical old model of the telegraphic instrument made by Prof. Morse in 1835 was in a N. Y. court room recently in charge of E. N. Dickerson, counsel for the Western Union Telegraph Company, the owner of the Page patent, in the course of the argument on the demurrer to the petition of the Holmes Burglar Alarm Company. David Dudley Field claimed that the original model of Prof. M. contained a set-screw governing the play of the armature, and that, such being the case, the portion of the Page patent covering that part of a telegraphic instrument could not be sustained. When Mr. D. came to reply, he produced Prof. M's. original model and exhibited it to the court. He declared there was no screw in it such as Mr. F. claimed, and that there never was such a screw there.

The screw in question, and upon which the decision of a case involving many millions of dollars may turn, is not an ordinary screw. It is a screw which was in common use many years ago, before the gimlet-pointed screw was invented. At that time when a carpenter designed to put in a screw, he was obliged to bore a hole in the wood. The invention of the gimlet-pointed screw obviated the necessity of boring the hole, because the screw could be driven into the wood with a tap of a hammer, and then made tight with a screw-driver. The screw in question seems to be, therefore, just such a one as Prof. M. would have been likely to use in 1835, and it would have then served the purpose of a set-screw, such as is now claimed by Mr. P. to be a part of his invention, and which claim is allowed by Judge Blatchford. If this decision is correct, it covers every telegraph instrument in use, and would place every telegraph company at the mercy of the Western Union. On the other hand, it is claimed that the screw in question was put there for some other purpose than to govern the play of the armature. As a matter of fact the screw in question does not now govern the play of the armature, because at the point of the armature opposite the screw there is a hole in the wood, as though it had been but there to prevent the end of the screw from performing that office. Whether that screw was really put there by Prof. M., or was a subsequent addition to the model by somebody, seems likely to be a matter of protracted dispute at law.—*Manufacturer and Builder.*

Good Health.

Sores.

Some time ago, a little child had a pimple on its breast, which became a little sore; an amateur doctor advised a "simple" remedy to be applied to it, which was done; neither the advice nor the remedy cost anything, except the child's life in 48 hours.

A gentleman had a small running sore on the top of his foot; he was anxious to have it "cured up." We advised him to keep it running, but that was troublesome, and it was healed up. In a short time a cold set in, and he died of consumption at the end of a year.

The son of a merchant wanted to reduce a swelling in the side, which began to "run;" general remedies were proposed, with advice to let the "sore" alone. This did not suit his views, so he had it healed up, and died of consumption within two years.

A lady had a sore on the leg; it interfered with her walking. She was impatient to have it "cured up," but was advised as to the consequences, but this was disregarded. The sore was healed up, and she died of consumption.

A lady, aged 70, had a sore leg, and was extremely anxious to have it healed up. She was advised, by all means, to make no application to it, but merely to keep it under control by general remedies. An old woman was applied to, and with various salves a wonderful "cure" was the result. Within a few weeks the lady took dinner in usual health, and died in an hour.

A lady, aged 66, had a long-continued, violent and painful cough. A "running" took place under the toe nail; she feared mortification, and was anxious to have it healed up. She was told that it was the best thing that could have happened to her, inasmuch as it would probably cure her cough and add years to her life; while, by improving the general health, the running might slowly dry up of itself, all of which proved to be so, and now, in her 74th year, she has better health than half our women at 40.

Our object in stating these facts, which have occurred in our own experience, within a comparatively short time, is to impress upon the reader's mind the signal danger of tampering with sores, especially such as are sometimes called "old sores," for they are the outlet to disease, and if injudiciously closed, what they would have discharged will be thrown in upon more vital internal organs, causing apoplexy, consumption or fatal congestions as certainly as the boiler of a locomotive will be shivered to atoms if the fire is continued and all escape of steam is prevented. In all cases of old sores, apply to a physician of age and experience. If that is not practicable, the safest and best plan is first, to diminish the amount of food eaten each day one-half and keep the parts in a cleanly condition by washing them twice a day in soft, milk-warm water until relief is given.—*Hall's Journal of Health.*

Physiology of the Turkish Bath.

Most accounts of the Turkish bath have been confined to general descriptions of the details of the process, and of the sensations experienced during its use; while comparatively little attention has, until lately, been paid to the more important consideration of its influence on the bodily functions. To supply this need, Mr. William James Fleming, M. B., lecturer on physiology in Glasgow, began some years since a series of careful experiments with the action of the bath on his own person. Mr. Fleming's experiments were all made between lunch and dinner, from 4 to 6 P. M. The experiments usually began with a heat of about 170° Fahr. for a few minutes, in order to produce sweating rapidly, followed by a temperature of about 130° Fahr. during the remainder of the stay in the hot rooms.

Omitting a description of the manner in which the experiments were conducted, and also the detailed result obtained, the following are the conclusions drawn by the author from those results. It was shown:

1. That a very large quantity of material can be eliminated from the body in a comparatively short time by immersion in hot, dry air; and although the greater part of this is water, still solids are present in quantity sufficient to render this a valuable emunctory process.

2. The temperature of the body and the pulse rate are markedly raised. The respiration falls at first, but afterward is less influenced than would be expected. Arterial tension is increased, due probably to the rapid action of the heart and the gorged condition of the capillary circulation.

From these the following practical considerations as to the use of the Turkish bath in medicine are deduced: Its most important effect is the stimulation of the emunctory action of the skin. By this means we are enabled to wash, as it were, the solid and fluid tissues, and especially the blood and skin, by passing water through them from within outward to the surface of the body. Hence, in practice, one of the most essential requisites is copious draughts of water during the sweating.

Excessively long duration of the bath seems to produce more or less depression, as shown by the fall of the pulse and temperature after 55 minutes.

The great advantage of the bath seems to be the power it gives of producing a free action of the skin in persons of sedentary habit, or suffering from disease. Beside, and along with this, it is an efficient means, if resorted to sufficiently early, of relieving internal congestion.—*Science Monthly.*

Shaving.

The more I reflect upon the mysteries of neurology and animal chemistry, the more confident I am that, while we are the least suspecting it, trifling errors in our daily life are producing important effects upon our corporeal systems; and I declare it as my deliberate conviction, that the habit, which may almost be styled American, of using the razor upon the face, is sufficient to cause a large proportion of the lamentable evils which affect the human race in this country.

It appears by experiment that the beard, if shaved, grows four to five times faster than if unshorn. In this calculation, an item is omitted which it is difficult to estimate, *i. e.*, the stimulue given the beard, by the first application of the razor in adolescence, the experiments being made upon beards after they have acquired an unnatural rapid growth. The effect of this early stimulus may be fairly counted at double the natural growth; then reckoning the difference in size and weight of the fiber, which is treble, and we find the frightful truth to be, that we raise 30 times the natural quantity of beard! Thus it is evident that the true beard is exhausted at a very early age, after which the system is forced to supply a substitute. Now nature will not submit with impunity to extraordinary demands upon her vigor, and that which requires her to produce in a lifetime 30 times as much beard as she was first inclined to, must certainly be considered as such. She is fatigued in proportion to the effort, let the particular kind be what it may; although her recuperative powers are great, she insists upon having repose, even when working at a rate chosen by herself. If that repose is denied her, she takes her revenge by breaking down the mechanism.—*Journal of Health.*

How to Keep Cool.—On going once into the Medical Museum in Edinburg, on a summer's day, we felt chilly, and on looking at the thermometer we found it at 68, while out of doors it was oppressively warm. Sixty-eight degrees in summer there, is quite cool enough for a sitting apartment; but if you go into a room of that temperature in mid-winter, a feeling of suffocation, of oppressiveness, comes over you. The noon of a day whose morning is 68 will give over 90 in the sun. If on getting up in the morning, every window and door of "*a floor*" are thrown open and thus remain until about sun up, and are then closed, shutters and all, it will be nearly night before the thermometer is materially raised, and persons coming into our office, often exclaim, "how delightfully cool your office is, how do you manage it." If we close our doors in mid-winter to keep the warmth in, may we not do the same thing in summer to keep it out?—*Journal of Health.*

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The Week.

Since our last issne we have had delightful, bracing summer weather in this city. The reports from the interior of the State ebow that a high temperature prevailed in the great valleye, while the foothille and the Coast Range rejoiced in the mild summer warmth of the young eeason.

The north wind which blew over the entire length of the State for several days, did considerable damage in some sections by sbrinking the wheat; hut the general prospect for a heavy crop of grain is excellent.

From all the mining counties of tbe State the reports of extended work and valuable developments are highly encouraging, and tend to the assurance that the product, hoth from placer and quartz claims, will be largely increased this year. Equally cheering news comes from all the outlying mining regione of the coast.

It may be seen that the House agreed to all the Senate amendments, increasing the appropriations for the improvement of harhors and rivers on the Pacific coast. And also, that the Committee on Military Affairs reported favorably on Horace Davis' hill to allow S. F. to use a part of tbe Government reservation, near Lime Point, for quarantine purposes.

The excitement over the unusual contest in the late convention at Chicago—an excitement which eeemed to be national rather than partisan—was intense in this city, and apparently etirred all parties. On the last day of the convention the etreets were thronged, and men were ecarcely ahle to restrain their emotion; and finally, when the result was made known, a feeling of grateful relief was widespread.

The ehipmente of hullion and the etate of the mining share market are detailed in the proper columns.

THE *Arizona Quarterly* is the name of a periodical to be issued soon by Thomae Gardiner, of Tucson, Arizona.

A General Business Revival.

There are cheering signs all around of a general revival of business. The depression which prevailed in this city and Stats and throughout the coast for the last two years has very generally ebated. Two years of comparative stagnation in husiness is a severe ordeal for a phsnomenally-active people; hut it is a short time compared to the periodical crises which convulse the commercial and manufacturing communities of the Atlantic seahoard. There the depression is all-pervading and prolongsd, and causes widespread misery. Fortunately, California is not suhject to the major evils which follow over-production and financiel derangement. It is true the stupendous speculativs wave which rolled over the country at the close of the civil war, and stimulated inflation and over-production, reached California at lest and caused a gradual hut severe check to industry and entsrprise. Our mining operations had hegun to flag under the effscts of decreased production and the heavy hut apparently necesssary assssments to meet the tremendous difficulties encountered hy the Comstock compenies. Of course the mining share merket felt the general reaction end fell into a condition of chronic dullnsss, and, as its ramifications are coextensive with the Pacific slope, every industry began to languish. But we think all the signs tend towards a general improvsment in business.

It will he conceded, we helieve, that in the relation of things, an industrial depreseion in Calfornia can only he temporary. For the reeourcee of the great young State are ee varied as they are vast. Gold, wheat, wine—her present great products—alone yield annually eboht $100,000,000, to make no mention of various lesser hut growing industries which contribute greatly to ewell the annual product. Her products are, too, equal to coined gold, and are in demand in the markets of the world. In addition to these home industries, the coutiguous States and Territories are largely tributary to thie city, end literally pour their treasures into her lap. In all of them, mining for gold and silver is the chief industry. They get a large psrcentage of the required capital here, and here also they buy their machinery, tools, and supplies, aud as soon as their mills produce bullion it is shipped to this city. These large sums enter into the general circulation and their distrihution quickens every hranch of husiness. The extent and value of this commerce with the outside mining districts cannot he overetated. For example: a gold or silver mine may he locatcd in tho very core of Arizona and owned in California or at the East. But, wherevcr it may be owned, the parties are likely to come to this city for their mining machinery—where there is the largest experience and the highest skill in that line—just as they would he likely to go to Pittshurg, New York or Boston for locomotives. A similar relation exists to parts of Mexico, and tho importance of this trade will grow immensely with the lapse of time. Some of our foundries get the contract to build a mill for these distant regions; wages are paid to our mechanics; various suppliss are bought here; end, finally, the hullion produced is almost certain to he sent here. All these transactions distribute money and promote husiness generally.

While the revival of business is general, the reaction in this city has heen perhaps a little slower than in the considerable towus of the interior. But it is apparent here in almost every department; for the demand alone for goode for countless mining camps has stimulated the husiness pulse, and enterprise is once moro afoot. So far as the mining share market is concerned, it may he said that the outlook is at least hopeful. Developments on the Comstock, or in Bodie, or in Columbus, or in some district of less note, may occur any day, and lead to a lively revival in mining shares.

WORK ON MINING CLAIMS.—Congressman Daggett, of Nevada, having been appealed to by some of his constitnents as to the proper interpretation of the new law regnlating work on mining claims, answers as follows: After consultation with the Land Commiseioner, I find that he has formally decided that the work on a claim may be done at any time within the 12 months beginning with the 1st January after the location has been made. Consequently locators have an entire year, together with the portion of the year preceding the 1st of January, following the location to do their firet annual work. Hence, a claim located now (May 15, 1880) would hold without work until January 1882, hut eome time between January 1, 1881, and January 1, 1882, the work must he done. This is the interpretation given hy the Attorney-General, and may he accepted as the law.

CONFLICT OF TITLE SETTLED.—We learn from the Bodie papers that the conflict of title hetween the Universal and Maryland Consolidated mining companies, which involved the right to a piece of ground lying hetween the companies, was settled amicahly May 31st, and the injunction suit commenced by the Marylaud has been dismissed. The ground which was in dispute is said to be valuable, as it ehows on the 500 level a vein carrying over four ft. of eolid ore rich in hoth gold and silver. The companies are to he commended for tbeir rational adjustment of the difficulty.

Arizona.—No. 7.

Yuma.

Yuma county occupies tbe soutbwestern angle of Arizona, from Bill Williems Fork on the north to the Mexican boundary on the south, and from Maricopa and Pima counties to the Colorado. Yuma, ths county seat, is es unlike an Amsrican town as possihls. The inhabitants are principally Mexicen, the houses one-story adohs, the streets narrow, and the whole aspect of the plece dirty, yet it is a modern place. It was founded in 1855 and named Colorado City. Then the name wes changed to Arizona City, and finally to Yuma City, in honor of Fort Yuma, on the Californian side of ths rivsr. The Indians (Yumas) constitute ahout half of the population, and thsir village adjoins ths town. An area of above 500 square miles on the north side of the Gila is taken hy ths Castle Dome mining district. Here a great numher of veins, passing from north to south, with an average dip of 75 ft., have heen traced for two or three miles. The ore is argentiferous galena in fluorspar gangue. The most noted mines are Castle Dome, Arkensas, Caledonia, William Penn, Little Willie, Flora Templs and Norme. In the district are also some copper and gold minss. A few miles north of Gila City ars the Cormorant and Las Flores mines, and a placer district to ths west of them; the latter discovered as far hack as 1858.

Forty-seven miles north of Yuma is the comparatively uew Silver district, including the settlement of Eureka. This district has some extremely rich ores. North of Silver is Eureka district, containing the Vernon, Bronco and Buena Vista mines; and north of this the large Weaver district extends heyond Ehrenberg to the Colorado Indian reservation, a narrow strip ahout 40 miles hy 10, lying along the Colorado, principally in Arizona, although a small portion is across the river on the Californien eide. Ehrenherg, ahout 80 miles from Yuma hy land, hut 140 hy water, contains about 600 inhabitants. The houses are of adohe. A few miles higher up the river are the Barriers, where the Colorado rushes through hetween two great rocks only 70 ft. apart. Copper is worked profitahly at the Planet mine, near Bill Williams Fork, and the county ie the principal galena field of the Territory.

Except portions of the Colorado valley, almost the whole of Yuma county is an apparent desert. But all is not desert that so appears. And much of the land needs only water to make it fertile. Over 1,600 square miles lie helow the level of the Colorado, and can he irrigated. There are great plains, or *playas*, of a deep, unctnous hlack soil, as heavy and rich as the land around Stockton. Water can be ohtained everywhere hy digging, and, where thie hae heen tried, along the stage road or railway; grain, vegetables, fruits and alfalfa prove the fertility of the land. The date-palm and paper-fiher yucca are fit plants for portions where water cannot be procured. The butte-like ranges of hills that rise up ont of these plains are full of ore. Gold, silver, lead, copper, ashestos and salt occur ahundantly; also borax, gypsum, selenite, pumice-etone, sulphur and soda.

"Thermal springs," says tbe Yuma *Sentinel*, "in sulphur and chalyheate, occur in many parts, as do those of warm, huhhling, medicated mud. The Indians know well their healing properties in all forms of rheumatism and of skin and venereal diseases. Potter's clay is ahundant enough, and the decomposition of feldspathic rocks has given the desert extensive beds of kaolin." The famous "gramma" grass and bunch grasses which form valuable pasture grow ahundantly. At present the scarcity of wood and water, and the deficiency of agriculture, are great drawhacks to mining operatione in Yuma county. As was previously noticed, the soil aloug the lower Colorado valley is exceedingly rich. Hinton eays that, after the overflow of the river in May and June, "the vegetable growths are amazing; pig-weed persistently runs np to 12 ft. in eix weeks, with a diameter of eight in.; wild hemp grows in ahundance 6 to 12 ft. in the same time; grass, simultaneously, grows from two to five ft. The depth of the overflow on the hottom is from one to three ft., and is eeven ft. above low water. The soil, if kept from overflow and irrigated, is well adapted to cotton, eugar-cane, grain, hemp and semi-tropical fruits."

Maricopa and Pinal.

The central countiee of Arizona are Pinal and Maricopa, which occupy together a rectangle of ahout 170 miles hy 100. As the district hetween Salt river and the Gila, including some of the most valuahle mines in the Territory, is divided between these counties, we will consider them together. The larger portion of Maricopa county extends over the open plains north and south of the Gila, but its northeastern portion, including the lower course of Salt river and its fertile valley, is mountainous.

As has heen hefore stated, a large portion of the Gila bottom, so unattractive and apparently desert, can he made to hear ahundantly hy irrigation, and the advent of the railroad will douhtlese canse this region to improve greatly. As Florence and Phœnix, on the Gila and Salt rivers, and the capitals of their respective counties, are approacbed, the signs of agriculture increase, and the country assumes a cheerful look. Alkali occurs hsre only where the ground hes been overflowed. The most conspicuous nativs plents here are the mesquit, greasewood and the "arrow resd"—a name given to a plant from which the Indiens make arrows, and which forms clumps of reed-like shoots rising from a common root to a hight of six to eight ft. The San Ysidro ranch, of 1,500 acres, is irrigated, and grows abundance of barley, wheat, hay, figs, grapes, etc.

The capital of Pinal Co., with ths classic name of Florencs, is situated on the Gila, 75 miles from Phœnix, 78 from Tucson, and 225 from Yuma. In 1877 its population was said to he ahout 2,000. It is, like Yuma and Tucson, in great part a Mexican town, with edohe houses of one story; but the Anglo Sexon American's cottage, and the "tepis" of the Indian, vary its constructions. Around it is a heautiful valley hottom, with rich, loamy soil. Ths streets are cooled by running streams of fresh water, brought from the Gila, and edged with cottonwood or willow. Extending along the hanks of the Gila, from within 15 miles of Florence to neer ths junction of Salt river, is the long and narrow tract reservsd for the Pima and Maricopa Indians, and kept hy them in a tolerably good state of cultivetion, corn, grain and vegetables attesting their industry. The Maricopas now numhsr ahout 1,500, the Pimas several thousand. The trihes livs in peece with eech other, and intermarry, hut in this cass the hushand addresses his wife in the language of his own trihe. Ths Pimas are slightly the taller men. Thess trihes are said to look for the return of Montezuma, and they have a tradition that their last revered monarch is huried heneeth the Sierra de la Estrella, a range which crops up from the plain north of Maricopa Wells, and west of the Gila, which bere hende to the north. On the southern extremity of these mountaine can be traced the prohle of a gigantic head, eyehrows, nose, forehead, lips and chin carved hy the forces of nature on the rocky slopes. The Indians call this the head of Montezuma, but irreverent Americans think it will do quite as well for Washington.

Phœnix, the capital of Maricopa Co., and of the Salt River region generally, is a neat little town, coustructed principally of adobe, with some brick stores, and inhahited in great part by Americeoized Mexicans. The streets are wide, and bordered with cottonwood trees, and the entire place hetter laid out than most semi-Mexican towns. The approach to the town is through groves of trees and fields of grain, giving it a pleasant aspect, and there are six grist mills in or neer it.

Phœnix is the center of trade of Salt River valley, which contains a great quantity of good land, and much of which is cultivated. In 1877 about 9,000 acres were laid down in harley, wheat and alfalfa. Hayden's near Phœnix, has a flour mill, a store, and several dwellings. About 10 miles from Phœnix, and extending thence to Maryville, on the Salt River hottom, 10 miles further, is a reservation granted to the Papago Indians in 1878.

Wickenburg ie a small town in the northwest part of Maricopa Co., on the borders of Yavapai, and ahout 60 miles from Prescott.

Ahout 15 miles eouthwest of Wickenburg is the Vulture mine, one of the oldest in the north of Arizona, and now, after a period of disuse, in active operation. The ore yields largely in gold. A mill of 80 stamps ie to he erected, and water furnished from the Hassayampa, 12 milee distant. Ahout eight monthe ago thie mine, discovered in 1862, was hought by the Central Arizona mining company, of New York. This company has a capital of $10,000,000, and is ready to expend $200,000, if necessary. The vein walls are mica slate, and the vein, which is 60 ft. wide, dips at an angle of 37°.

Ahout 30 miles north of Phœnix is the Cave Creek gold region. But the chief mining dietricts of central Arizona lie hetween the Gila and Salt rivers, partly in Maricopa and partly in Pinal, the lodes running with a very natural disregard of county lines. These districts, the principal of which are the Globe and Pioneer, are in general well eupplied with wood and water from the Pinal, Apache and Superstition ranges, on which they are located.

Bullion Shipments.*

Since our last issue, we have noticed the following hullion shipments:

Northern Belle, June 2d, $9,101; Tombstone, May 29th, $4,381.16; Contention, May 29th, $8,676.70; Christy, June 3d, $11,358; Con. Virginia, June 4th, $145,878; Paradise, June 3d, $4,496.73; Lseds, May 31st, $4,750; Bodie, June 2d, $5,477; Tombstone, first week in June, $40,000; Bullion, June 5th, $4,000; Northern Belle, June 5th, $9,618.29; per Union Pacific Express Co., June 5th—Ontario, $4,918,79; Barbee & Walker, $1,716.39; Christy, $1,642 87; total, $8.278.05; May product of the Star, $26,400; May product of Bodie, per Wells, Fargo & Co., Noonday and North Noonday, $63,873.95; Bodie Con., $23,389.99; Bulwer Con., $15,651.99; Standard Con., $190,747.19; others, $1,814.85; total, $294,977.97.

*Desirlng to make our list of Bullion Shipments as complete as possible, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

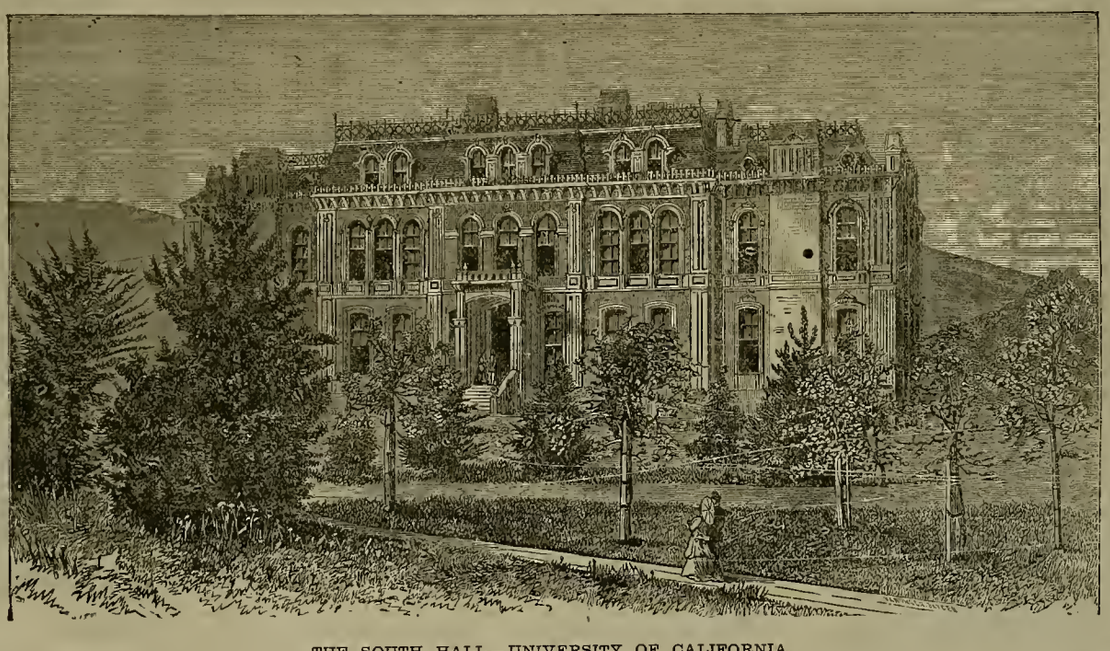
PROCTOR, the astronomer, in the June *Scribner*, punctures the fantastic theories of Jevone about the connection of sun-epots with financial panics.

The University of California.

On Thursday morning, August 5th, prox., another academic year will begin at the University of California. We have deemed it timely, as many of our younger readers are now thinking about taking up new courses of study, to present a few facts about our State University, and to grace the statement with an engraving of the South Hall, the handsomest building of the University group.

Rather than enter upon abstractions as to the art and science of education which are too wearisome for the vacation season, we shall confine our allusions at this time to the leading facts in the history of the University of California and the requirements demanded in those who are admitted to its classes. For these facts we are indebted to the official "Register" of the institution. Though they may already be familiar facts to many of our readers, there are numbers more who never have seen the University nor been informed as to its scope and methods.

The University of California is located in Berkeley, Alameda county. It is a State institution, established by the Legislature in accordance with the Constitution, and intrusted to the care of a Board of Regents, which includes the Governor, the Lieutenant-Governor, the Speaker of the Assembly, the State Supt. of Public Instruction, the President of the State Agricultural Society, the President of the Mechanics' Institute of S. F., the President of the University, and 16 other Regents. To this body of Regents the State has committed the administration of the University, including the finances, care of property, appointment of teachers, and determination of the interior organization in all particulars not already determined by the laws. The instruction and government of the students at Berkeley are intrusted to two Faculties, which have hitherto acted as one body—the Faculty of Science and the Faculty of Letters. The Medical and Law Faculties, in S. F., are distinct bodies. In accordance with the law, eight Colleges have been organized, as will be seen by the following. These Colleges or Courses are designated in the Political Code as follows: 1. College of Letters; 2. College of Agriculture; 3. College of Mechanics; 4. College of Mining; 5. College of Engineering; 6. College of Chemistry; 7. College of Medicine; 8. College of Law.



THE SOUTH HALL—UNIVERSITY OF CALIFORNIA.

The University was instituted by a law which received the approval of the Governor, March 23, 1868. The instructions were commenced in Oakland in the autumn of 1869. The commencement exercises of 1873 were held at Berkeley, July 16th, when the University was formally transferred to its permanent home. Instructions began at Berkeley in the autumn of 1873, two excellent buildings having been constructed at the expense of the State. The site of the University, at Berkeley, is a domain of about 200 acres, situated on the slope of the Contra Costa hills, about five miles from Oakland, facing the Golden Gate. It is traversed by two water courses, is much diversified in aspect, and is adapted to a great variety of culture. A part of the site is reserved to illustrate the work of agriculture and horticulture, and is now under cultivation. The grounds have been thoroughly surveyed and studied, with reference to their adaptation to all the wants of the University. So far as possible, such students as desire to earn something by their manual labor will be employed upon the grounds. For admission to the Colleges of Science, candidates must pass a satisfactory examination in higher arithmetic, in all its branches, including the extraction of square and cube roots, and the metric system of weights and measures; algebra, (Davies' Bourdon or equivalent) as far as the general theory of equations; geometry, the nine books of Davies' Legendre, or their equivalent from another author; English grammar, rhetoric, geography and history of the United States. It is believed that these requirements can be met by a bright and determined scholar residing in any part of the State. The proper text-books are easily procured. The examination is meant to be thorough and strict, but it is not meant to be so technical or exacting as to deter scholars who have not had the best advantages of tuition. Students who show a capacity to pursue with profit the course marked out, are sometimes admitted on condition that they will make up their deficiencies. At the same time, thorough preparation, where it can be had, is of the greatest importance.

Tuition in the Colleges of Science and of Letters is free to residents of California. Students from other States pay a matriculation fee of $25, and a tuition fee of $50 per year. A small charge for chemicals is made in the chemical laboratory. Young ladies are received as well as young gentlemen. Board is obtained in private families at Oakland and Berkeley, at from $20 to $30 per month (lodgings included). The hours of recitation are such that many students reside in Oakland and San Francisco. Steam connection with S. F. brings the University within one hour of that city.

The rules of the University are few; the exactions are strict. Good behavior, under all circumstances, regularity and punctual attendance at all appointed exercises, diligence in study, and the maintenance of thorough scholarship, are expected from all the students. Failures or negligence in any of these respects will render the student liable to private and public admonitions, to dismissal, and, in cases of heinous misdemeanors, to expulsion. Formal reports are not regularly transmitted to the parents, but the Professors will be ready to give information respecting the standing of a student, to his parent or guardian, whenever it is requested.

Oregon Swamp Land Commission.—Sec'y Schurz decided June 7th, the Oregon swamp land cases arising in the Oregon City Land Office which were appealed last November. The Secretary reverses the decision of the General Land Office, and holds that the Oregon swamp grant was one *in priori*, that there has not been any forfeiture, either as to the land surveyed prior or subsequent to March 12, 1860, or whether selected within two years from the adjournment of the State Legislature or not, and consequently that all lands in Oregon actually swamp, must be certified to said State. This, and the Dennis Crowley decision, terminates in favor of the State of Oregon, all disputes between the U. S. and the said State, that have been pending under the Swamp Land act of March 12, 1860, for 20 years.

Cheap Concentration.—It appears that the low-grade ores of the Freeland mine in Colorado are concentrated at the rate of 50 cents per ton. This information was given to the *Enterprise* by Mr. Osbiston, a well-known Comstock mining expert, and now manager of the Freeland. The Freeland machinery is driven by water-power; and it is suggested that the mines of the Comstock, several of which contain thousands of tons of a low-grade ore, could also use water-power by running their ores through the Sutro tunnel to Carson river. It is evident that the time is coming when the poor ores of the Comstock will be utilized and made profitable by simple and cheap concentration.

Carson and Colorado Railroad.—On Monday, May 31st, work was commenced on the Carson and Colorado railroad. Mr. Yerington, President of the company, threw up the first shovelful of dirt about one-half mile east of Mound house, near Carson, and immediately afterward about 80 workmen, under the direction of Supt. Laws, were set to work. The total force of white laborers employed on the road numbers nearly 300, who receive $1 per day and board. A gang of 100 Chinamen are at work at Walker's lake, in a barren section where, from lack of wood and water, white men have refused to work.

Patent Office Models.

There is a common impression abroad that inventors no longer need prepare models to send with their applications for patents to Washington, and that drawings alone will now answer the purpose. This is a mistake. Some weeks ago the Commissioner of Patents issued an order that models need not be filed "except when required by the examiner in charge." It is this order which has led to the misapprehension.

It happens, however, to be a fact that many of the examiners can, with difficulty, "read" drawings, and require the model in order to understand the drawings. An inventor is, therefore, liable to be called upon any day for the model in any case, and in order to be prepared to meet the call promptly, the inventor should send his model, through his agent, with the specifications and drawings.

If the case is forwarded without models, there is liability of great delay, which generally happens when least expected. As the inventors furnish the models, and as they are necessary for making proper drawings, it is much better to have them, anyhow.

After the case is filed in the Patent Office, and has waited its turn two or three weeks, when it is taken up by the examiner and he demands a model, it delays the business of procuring the patent very materially, since, instead of receiving definite news about the application, the inventor receives a notice to furnish a model. Inventors on this coast would be then greatly delayed. It will take a week each way for the letters, a week or more to make the model, and then the case must again wait its turn. Then it is difficult to make a model to agree exactly with the drawings already filed, and these must agree according to the Patent Office rule. It may be, therefore, necessary to make new drawings, which will entail still further delay, since the specification must then be altered to suit the changed drawings.

Altogether those familiar with Patent Office affairs will see that it is as necessary now to furnish models as it was before the Commissioner's order was issued.

Gold and Silver in N. J.—The N. Y. *Sun*, May 22d, tells a story of discoveries of gold and silver near Plainfield, N. J., which excited the most lively interest. The story runs that the discovery occurred in an old and abandoned copper mine known as the Field mine, and that the lucky finders obtained assays from the rock of a highly satisfactory character. The mine was at once leased for 12 years, and a prominent capitalist, after a "thorough inspection and examination," offered to advance all the money required to carry on the operations. Already, it is stated, some $50,000 worth of machinery had been ordered. And shortly—the account adds with charming *naivete*—"the ore, or what is said to be ore," will be transported to the mills which have been secured at Plainfield. Nothing seems to excite such a lively faith as gold and silver mines.

Montana Lead Bullion.—We learn from the Glendale *Atlantis*, Montana Ter., that the smelting works at that place had shipped June 1st, 184,000 pounds of bullion (about 19 narrow-gauge car-loads), besides having some 10 car-loads on hand. Several lots of copper matte were also shipped.

The Treasury Department has purchased 438,000 ounces of fine silver, for delivery at the Philadelphia and S. F. Mints.

The Old Vulture Mine.

The Vulture mine, once the most celebrated in Arizona, is now the property of Chicago capitalists, and is styled the Central Arizona Mining Co. The property is situated in Wickenburg district, Maricopa Co. The operations of the original company were attended with great difficulties, not the least of which was the scarcity of water. The cost of transporting the ore from the mine to the mill was enormous. The present company has wisely resolved to keep mine and mill together. For this purpose they have undertaken the project of conducting the water from Hassayampa creek to their new mill, a distance of about 15 miles. We learn from a note just received from a correspondent at Seymour, that the mill is progressing rapidly, and that all the sheet-iron for the water-pipe has arrived from Pittsburg, Pa. The pipe is made on the ground at the rate of 2,500 ft. daily, and is more than half completed. Hassayampa creek will afford a copious supply of water for all the requirements of the mill and have a large reserve. It is estimated that the cost of conducting the water from the creek to the mill will be about $60,000. The new mill will be finished, it is hoped, in the early fall, and will be the largest and best equipped in Arizona.

The ore body of the Vulture is reported to be of great width, holding the gold free, and averaging from $10 to $12 per ton. Owing to the size of the vein or body, and the facility with which the ore can be mined, it is estimated that the expense of mining and milling will not exceed $4 per ton. Work on the new double compartment shaft was commenced March 1st, and has been since carried on night and day. The east compartment is now 200 ft. deep, and the west 185 ft. Levels are being run at the depth of 150 feet; and, as the ground is easy to work, good progress is made in shaft and levels.

We believe the original company on this celebrated mine was not successful, for it must be remembered that in the early days of Arizona the wily and ever-present Apache rendered prospecting and mining exciting, but hardly profitable, to say nothing of the extraordinary expense of labor and supplies in that wild and vacant country. The prospector is tempted fate. The miner literally held the pick in one hand and the rifle in the other. While one party entered the mine to work another stood guard on the surface to prevent a surprise from the savages. At the mill, rifles were kept within reach of the workmen. But the Apache has gone, to return and vex no more. In nearly every part of the Territory mining and business operations, thanks to the present and coming railroads, may be carried on without molestation and at reasonable expense. Under these new and auspicious conditions the Central Arizona mining company has a fair opportunity to develop its splendid mine, and to render the later history of the Vulture mine more famous than its first.

Rich Gold Ore.—According to the Sacramento *Bee*, an abandoned gold quartz claim at Walltown, nine miles south of Folsom, has just disclosed a rich nest of ore, only two ft. from the point where work was stopped several years ago. Some idea of the richness of the rock in the claim, which is a sort of decomposed quartz and is easily removed with a pick, may be formed when it is known that from nine sacks of the ore 42 lbs. and 10 ozs. of gold were taken, and as the value of the gold is $17.50 an oz., the lucky finders cleaned up about $9,000. The "pocket" is about the size of a 25 by 15 room, and it is estimated that there is in it quartz which will "pan out" over $100,000. The ore is easily milled, and can be worked with satisfactory results in a hand mortar.

Extraordinary Work.—They are doing extraordinary work in the Sutro tunnel. During the month of May, says the *Territorial Enterprise*, the north branch of the Sutro tunnel was extended 321 ft., 106 ft. of which was during the last week of the month. During the same month the south branch was extended 315 ft., 148 ft. during the last week of the month. This is all splendid work, but that done in the south drift is the best ever done on the Comstock, and it is boldly asserted, the best ever done in the world. It is really remarkable when we consider that the branch is 10 ft. wide and 8 ft. high.

The Auburn Mines.

The revival of gold mining in California is general, and old Auburn, in Placer county, feels the new activity. During the past year a large amount of capital from the East has engaged in mining enterprises in that region, which has aroused general interest in its mines of gold quartz. The Julian mine, five miles below Auburn, situated on the granite belt, was sold a few months ago to Eastern parties for $200,000, and was considered a cheap property. The Crater mine, formerly owned by the St. Patrick Co., is now under individual ownership, and is being managed with system and profit, its product in the last four months having been $50,000. The Bellevue, another mine that failed in the hands of San Francisco men, is making a regular profitable output under local control and ownership. The Shurtleff mine, on Duncan hill, a locality that is prolific in quartz ledges, has for several years given a yield of over $25 per ton. The Conrad, on the same hill, an old location, is being opened by E. W. Roberts, an experienced miner, who recently made his first crushing of 20 tons, which gave a yield of $106 per ton. He has opened on a fine ledge that averages from 20 inches to two feet in size. The ledges of that locality are in metamorphic state. The Ohio, in the vicinity of the Crater mine, is another very promising mine in the course of development. The custom mills are kept constantly running on ore for prospectors or companies not owning mills. One of these custom mills reports that in a crushing of over 1,000 tons from 25 to 30 different ledges, the average yield was over $22 per ton. There are also in the country to the south of Auburn, some old river bed deposits found in the ridges, formerly worked, but latterly receiving more attention, as the price of water has cheapened, and several such claims are now being worked to a profit. The Yankee Hill Co. cleaned up last week, after a 10-days' run, $2,000, on a labor and water expense of about $400. Altogether the country about Auburn, by means of its fruits and mines, seems to have entered upon a new era of prosperity.—*Grass Valley Union.*

ARIZONA.—It is assumed by most writers on Arizona that it is none other than the famous "Arazuna" of the Spaniard. Mr. R. A. Wilson, in one of his works on Mexico, says: "We have the following record in evidence of the masses of silver extracted at Arazuna: Don Domingo Asmendi paid duties on a piece of virgin silver which weighed 275 pounds. The king's attorney (fiscal) brought suit for the duties on several other pieces, which together weighed 4,033 pounds. Also for the recovery, as a curiosity, and therefore the property of the king, of a certain piece of silver of the weight of 2,700 pounds. This is probably the largest piece of *pure* silver ever found in the world." Ward, the British minister to Mexico, says in his report that he saw the correspondence in regard to these masses of virgin silver, that he obtained a certified copy of the decrees, and that its authenticity was unquestionable. The aggregate weight of those nuggets amounted to 6,908 pounds, which, at a valuation of $17.60 per pound, gives the sum of $121,580.80. Silver nuggets have been picked up of late years in many parts of the Territory, and veins containing the precious metal in an almost pure state have been discovered.—*Conservative.*

CATFISH IN THE BELCHER MINE.—During the late suspension of pumping in the Belcher, the pump nearest the surface was overhauled, and at the clack were found a number of catfish, one being nine inches in length and fat as mud. There were some 20 smaller ones, ranging in size down to less than an inch in length. About two years ago W. P. Bennett purchased a lot of these fish and placed them in the Belcher tank on the surface, where they grew and bred. A very fine wire screen was placed over the outlet of the tank to prevent their escape. These fish must have wiggled through this screen when very small and then found their way through the connecting pipes to the pump column. It is a mystery, however, how these fish could have lived in the hot water raised by the pumps, for if one from ordinary water is placed in it, it immediately scalds the skin off. But the fact that they did live in it and thrive on it is attested by their presence there, and the fine condition of the large one taken out.—*Gold Hill News.*

Rainfall West of the Sierra Nevada and Cascade Mountains.

[By PROF. JOHN LE CONTE.]

At first sight, we might suppose that as all the great belt of country lying west of the Sierra Nevada and Cascade mountains, is exposed to the full influence of the vapor-bearing west winds coming from the vast water surface of the Pacific ocean, it would receive an unfailing and bountiful supply of rain. The interposition of the comparatively low coast ranges, between the great valleys of California and of Oregon, and the vapor-bearing winds from the Pacific, could hardly be expected to produce any very great diminution in the supply of moisture reaching these valleys. Yet the fact is far otherwise. Indeed west of the coast ranges, no less than on the great California valley, the rainfall, although usually sufficient to assure a remunerative return to the farmer, is frequently very scanty, especially the southern portions. Considering the comparative proximity to the great water-surface, and the direction of the prevailing winds, it is astonishing how little rain falls on the Pacific coast between San Diego and Cape Mendocino. Not only is the amount of rainfall smaller than might be expected, but it is quite irregular, and thus involves the element of uncertainty. For example we have the following extreme fluctuations in the annual rainfall at San Francisco and at Sacramento:

SAN FRANCISCO.		SACRAMENTO.	
Season.	Rainfall.	Season.	Rainfall.
1850-51	7.40 in.	1850-51	4.71 in.
1861-62	49.27 in.	1861-62	35.65 in.

Table of Rainfall.

The following table exhibits in a striking manner the increase of rainfall as we advance northward along the Pacific coast.

Rainfall West of Sierra Nevada Mountains.

Stations.	North Latitude.	Coast or Valley.	Average Rainfall in Inches. Spring.	Summer.	Autumn.	Winter.	Year.	Extent of Record in Years.
Fort Yuma	32° 44′	.....	0.25	0.68	1.49	1.04	3.46	9¾
San Diego	32° 42′	Coast.	2.02	0.45	1.43	5.21	9.16	13
Drum Barracks	33° 39′	Coast.	2.93	0.60	3.90	11.83	19.26	2¼
Monterey	36° 36′	Coast.	5.23	0.25	2.42	7.39	15.29	4
Fort Miller	37° 00′	Valley.	7.25	0.00	2.93	8.81	18.99	6¾
San Francisco	37° 48′	Coast.	5.48	0.07	3.58	14.91	24.04	23
Stockton	37° 57′	Valley.	3.33	0.32	1.21	8.33	13.69	3½
Sacramento	38° 34′	Valley.	5.75	0.10	2.63	11.03	19.56	18
Camp Far West	39° 07′	Valley.	9.01	0.00	3.13	8.41	20.60	2½
Fort Humboldt	40° 45′	Coast.	9.36	0.73	6.50	10.33	35.92	11½
Camp Gaston	41° 10′	Coast.	13.17	1.21	12.13	35.64	62.20	4½
Fort Terwah	41° 49′	Coast.	14.20	3.30	22.16	30.27	69.93	2½
Camp Lincoln	41° 55′	Coast.	15.25	1.17	12.26	52.91	81.59	1½
Fort Orford	42° 44′	Coast.	18.26	3.11	19.92	29.30	70.59	3
Fort Umpqua	43° 42′	Coast.	16.33	2.86	15.64	32.08	67.41	6
Blockhouse	44° 25′	Coast.	26.28	2.53	31.15	36.33	96.29	1¾
Fort Haskins	45° 02′	Coast.	14.09	2.65	14.88	34.49	66.71	6¾
Fort Yamhill	45° 21′	Valley.	13.10	2.39	13.20	26.90	55.59	9¼
Astoria	46° 11′	Coast.	19.62	5.63	18.44	34.91	78.60	18
Fort Stevens	46° 12′	Coast.	9.14	6.54	19.12	51.02	85.82	1
Cape Disappointment	46° 17′	Coast.	14.37	7.20	23.88	29.45	74.90	2
Fort Steilacoom	47° 10′	Coast.	9.97	3.42	11.76	18.83	43.98	16
Neah Bay	48° 22′	Coast.	28.13	11.62	36.73	46.37	123.35	3½
Sitka	57° 03′	Coast.	14.51	15.66	30.99	22.23	83.39	10½

Abnormal Distribution of Rain on the Pacific Coast.

A glance at the foregoing table reveals several remarkable and seemingly abnormal results in relation to the distribution of the rainfall along the Pacific coast. (1.) The annual rainfall augments with increase of latitude. Thus, the annual amount of rain varies from less than four inches in the Yuma and Gila deserts, at the head of the Gulf of California, to eighty inches on the coast of Washington Territory. Now it is well known, that the general law is that the average fall of rain is greatest near the equator, and diminishes as we proceed towards the poles. This law evidently depends upon the relation which the tension of the vapor at the water surfaces usually bears to the efficiency of the solar radiation incident in different latitudes. Under normal conditions, the greater perpendicularity of the solar rays, incident in lower latitudes, imparts a higher temperature to the oceanic surfaces, consequently a higher tension to the aqueous vapors contained in the superjacent air; so that an equal reduction of temperature must precipitate a larger amount of moisture in a warm than in a cold climate. Thus the following table shows the average annual rainfall in different latitudes, according to the estimates of Prof. Loomis and Guyot; to which are added two columns, likewise indicating the decrease of rainfall with increase of latitude:

Loomis. Rainfall in ins.	Lat	Guyot. Rainfall in ins.	Annual Rainfall in inches.		Annual Rainfall in inches.	
104	0°	100	Tropics.....	102	Tropics..	96
85	20°	80	Temperate zone.....	36	Italy.....	45
70	30°	60	Frigid zone	12	England..	37
40	40°	40			N. Germany..	22½
30	50°	30			St. Petersburg...	17
25	60°	20				
20	70°	10				
	80°	5				

It is evident that on the Pacific coast this general law is completely reversed, and it is equally obvious that there must exist some active physical cause adequate to produce this anomalous result.

(2.) The second abnormal result indicated by our table of rainfall on the Pacific coast is that at Cape Mendocino (or about latitude 40° to 41°) there is a sudden increase of the annual rainfall from about 20 inches to 44 inches, or more; with a more gradual augmentation from this latitude in advancing northward along the coast. (3.) The third abnormal result, indicated by the same table, is that between San Diego and Cape Mendocino (from latitude 32° 42′ to latitude 40° 26′) scarcely any rain falls during the three summer months; but that north of the latter point the rains are more uniformly distributed throughout the different seasons, although the winter still continues to be the period of greatest precipitation. The contrast in this respect between the distribution of the rainfall according to seasons on this coast and that on the Atlantic coast of the United States is strikingly exhibited by the following table of the average rainfall, according to seasons, at various points along the latter:

Table of the Rainfall Along the Atlantic Coast of the United States.

Stations.	North Lat.	Average Rainfall in Inches. Spring.	Summer.	Autumn.	Winter.	Year.	Extent of Record in Years.
Fort Pierce	27° 30′	9.56	22.62	14.74	10.80	58.02	6¾
Jacksonville	30° 20′	10.91	21.07	12.04	8.70	52.72	6
Savannah	32° 5′	10.05	20.02	8.03	8.42	48.32	23½
Charleston	32° 47′	8	22.93	8.42	8.27	45.11	22
Fortress Monroe	36° 59′	10.17	15.32	10.57	10.67	47.04	10½
Philadelphia	39° 57′	10.19	10.23	9.37	9.51	41.10	23
Fort Columbus	40° 41′	11.35	11.05	10.07	8.91	41.95	23
Newark	40° 45′	11.58	11.58	10.84	10.04	44.85	23½
New Haven	41° 18′	10.84	11.71	11.53	10.70	44.78	21½
New Bedford	41° 38′	10.73	9.75	10.52	10.42	41.42	54
Providence	41° 50′	10.54	10.14	10.48	10.22	41.33	35
Boston	42° 22′	10.40	9.51	0.48	9.35	33.54	20
Concord	43° 12′	0.54	10.57	11.31	0.27	40.00	83
Hanover	43° 42′	9.57	11.09	10.53	9.03	40.32	19
Brunswick	43° 54′	11.71	11.71	11.42	0.94	44.68	32
Gardiner	44° 11′	10.57	10.46	10.49	10.27	42.00	27
Fort Sullivan	44° 54′	8.57	10.46	9.46	10.02	30.41	83
Washington	38° 53′	10.10	12.77	8.10	10.02	41.65	5

(4.) The fourth fact shown by the table of rainfall on this coast is not anomalous, being in conformity with the general laws of rain. It is that the amount of annual rainfall in the great California and Oregon valleys is considerably less than it is on the sea-coast west of the the Coast ranges. This is much more conspicuously true in latitudes north of 41°, where it is surprising how quickly the atmosphere becomes drained of its vapors as we leave the coast and proceed inland. The Coast Range mountains along this portion of the coast being cooler, act more powerfully as condensers as the vapor-bearing winds are forced up the western slopes.

CHESAPEAKE AND DELAWARE SHIP CANAL.—It is said that the congressional committee to whom was referred the question of a proposed ship-canal to connect the Delaware and Chesapeake bays, will shortly report (if they have not already done so) in favor of a route leaving the Chesapeake at Queenstown, Md., running across to Lewes, Del., and terminating at the Delaware bay about five miles above the Delaware breakwater. The total length of this line will be 51 miles. The canal will be 200 ft. wide and 25 ft. deep, and will therefore be capable of accommodating vessels of the largest class, and of allowing two such vessels to pass each other. On this route there are no natural water ways, and the whole line will require to be excavated. There will be no locks except tide-locks. It is believed that the canal can be built for $31,000,000, though the report it is understood, will ask for a somewhat larger appropriation. Respecting the advantage of this much discussed project, it is to be noticed that vessels bound to any European port north of the Mediterranean would be able, by going through the canal, to save the time consumed in sailing down the Chesapeake and around the capes. It would make the trips of the trans-Atlantic lines of steamships entering and leaving the Chesapeake nearly two days shorter. The report will also recommend that the canal he constructed under the supervision of the War Department.

WRECKLESS WRITING.—The young mining departments of the great dailies are impatient to make a reputation for smashing something—to become terrible, as it were. One prints correspondence which annihilates a company per line, and such companies as the North Bloomfield and Spring Valley at that, and hydraulic mining in general; still the gravel mines of California continue to yield 12 to 15 millions per annum, and have averaged that for 20 years. This correspondence admitted in the financial columns of the *Tribune* is calculated to do serious injury; but such dangers are incident to building a mining market on "news." Some irresponsible correspondent may come along and demolish months of reports and telegrams from experts and superintendents with one fell swoop of his pencil.—*Bullion.*

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In witness whereof we have hereunto set our hands and seals, this first day of May, A. D. 1880.

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In witness whereof, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written. SAM'L S. MURFEY, Notary Public.
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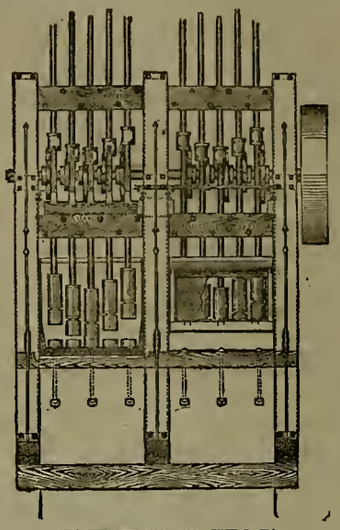

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FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.
We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,550.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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Rock Breaker and Pulverizer combined in one machine for pulverizing very fine.
Furnaces for chloridizing and desulphurizing ores.
Concentrating Jigs and Slime Machines for concentrating

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Amalgamators, and plans for working ores by the various processes. Address

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Care of Prescott, Scott & Co., San Francisco.

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING JUNE 1ST, 1880.

228,260.—GUIDING HEADERS—W. H. Keene, Woodbridge, Cal.

228,267.—PNEUMATIC ANNUNCIATOR—D. and T. Morris, S. F.

228,234.—ELEVATOR GOVERNOR.—I. H. Small, S. F.

228 419.—EYE FOR HOES—J. R. Thomas and T. A. Paul, Calpella, Cal.

228,198.—PRESERVING FRUITS—H. G. Hulburd, Placerville, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patsnt Agency, the following are worthy of special mention:

RAILROAD RAIL JOINT.—Silas Harris, 7 Liberty St., S. F. The ordinary form of rail joint is made by means of fish-plates on each side of the rail, crossing the joint, slots heing formed through the fish-plates and rail, so that holts may pass through them, these holts heing secured in place hy nuts. The difficulty with this connection is that the nuts are continually being shaken loose until the holts fall out and the plates drop off, leaving the meeting ends of the rails without proper support. This difficulty is ohviated hy discarding the screw holts entirely, and using holts which are held in place hy an eccentric, which, while it can he loosened when desired, will not jar loose hy the passage of trains. This device consists in hinding the fish-pla e against the sides of the rail hy means of an eccentric horizontal holt or fastening connected with said fish-plats through peculiarly-formed holts or plates. The eccentric joins the parts together immovahly, and dispenses with all nuts or screw-holts.

ELEVATOR GOVERNOR.—Isaac H. Small, 574 Brannan street, S. F. Patented June 1, 1880. No. 228,284. This invention relates to that class of elevators wherein the safety-clutches are operated hy rotating governors, independent of tbe hoisting rope. As the elevator is raised and lowered hy the cahle in the usual way, the friction ratchet, or rope connected with the end of the governor-shaft, causes the governor to revolve whenever the cage is in motion. If at any time the rope should hreak or any accident occur which would cause the epeed of the elevator to be accelerated to a higher degree than safety warrants, theu the governor revolves with proportionate speed. At a certain point the collar of the governor will have moved the sleeve with its dog far enough forward to release the end of the hell-crauk lever from said dog. The spring then draws the hell-crank lever down and moves the bar or rod over, and this, in its turn, by heing counected with the arms of the dogs or catches, throws said dogs into the sides of the guides, and they hold the elevator.

GUIDING-HEADER.—Walter H. Keen, Woodbridge, San Joaquin Co., Cal. Patented June 1, 1880. No. 228,260. This invention contemplates forming a peculiar jack-staff, carrying the caster guide-wheel helow, and arranged above as a guide for the cutter-har level, the whole heing in front of the driver, so that a seat may he provided at the rear end of the heam, upon which the driver may sit during his work. The tiller for steering the header is swiveled on the rear end of the cutter-har level, and so combined with it as to serve also as a means of raising or lowering said lever. It further consists in forming in a peculiar manner an automatically movahle fulcrum for the cutter-har lever, to keep the header on an equal halance, so that the cutter-bar is raised with little friction, and the strain relieved from the links connecting the cutter-har frame with the pole carryiug the guide-wheel and driver.

HAME RING.—A. J. Larsen, 420 Jackson St., S. F. Patented May 25, 1880. No. 227,982. This invention relates to improvements in what are known as the "hame-rings" upon working harness; and it consists in a rein-leading ring for hames, consisting of the slotted, ewiveled rod provided with the semi-circular extension, the sliding-ring section provided with the hook or loop, and a coiled spriug, all attached to the hames. In driving horses to or from their work without the vehicle it is customary to douhle the reins up and push them through the hame-ring upon the near side, or to hang them upon the end of the hame itself, and when the hridle is removed for the purpose of feeding it is hung upon the hame. In either case the reins or hridle are liable to become displaced and fall to the ground, and this invention prevents such accidents, hesides making it very easy to introduce or remove the reins.

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held on Monday evening last, Prof. Davidson in the chair. Among the gifts to the Museum, was a peculiar spider, akin to the scorpion, from P. S. Buckminster, of Bellville, Esmeralda county, Nevada. It was classified as *Galeodes*, and is the first of the species known to have heen found in America. Mr. Gullichsen, of the Pacific Rolling Mills, presented, through Prof. Davidson, some pieces of crystallized iron taken from a cavity found on the hreaking up of a shearing machine, supposed to have heen cast in the ordinary way. The crystallizations, which had hecome shaped in a sort of cavity within the iron, were formed like miniature cedar trees, were very heautiful. The Smithsonian Institute, at Washington, presented, through Prof. Baird, a collection of 178 specimens of marine invertehrates, collected hy the U. S. Fish Commission on the Atlantic coast, to he retained for scientific comparison.

Mr. P. S. Buckminster read a paper on "Cyclonic Winds," which he described as moving from right to left. He observed small whirlwinds in Nevada, having a diametar of 20 ft., with half a dozen smaller fringing whirlwinds of a foot diameter, moving at 20 times the velocity, moving within its area in a circle, thus showing whirlwinds to have three separate motions of different velocities, the third heing the forward motion of the whole column of air. He argued that electricity is either an involved agent or an evolved condition of the storm. Mr. Buckminster then read another paper on soms "ice forms" in mines of Nevada, very unlike crystals formed in the external air. Hs thought the peculiar determination of form was not accidental. At the closs, Prof. Davidson offered some highly interesting explanations of how the formations took place, quoting freely from Sir John Herschell, Mr. Elliott and Prof. Jos. Le Conte, who had previously ohserved, and Prof. Le Conte had explained, their formation.

Mr. C. W. Brooks then made some remarks on ethnology, saying: The many interesting problems of ethnology, which arise while tracing the early migrations of races have led us to consider the scattered fragments of an ancient people whose descendants may now be traced over large groups of islands in the Pacific ocean.

A careful study of all co-related evidence leads us to the firm helief that the present hed of the Pacific ocean was once an area of earth's surface ahove the level of the sea, and hecame suhmerged hy some spasmodic catastrophe when the equilihrium of earth's forces was temporarily disturhed, involving conditions which depressed new heds for water, and while estahlishing new water-lines as the houndaries on continents, necessarily formed islands of peaks and mountain summits lofty enough to remain unsuhmerged.

Such a Polynesian continent was undouhtedly inhahited hy early ancestore of the North American Indian, the Japanese, the Hawaiian, and the hroader classifications we term the Malay race. All races at the pressnt day are, to a certain extent, composite or mixed races; hut a majority of the Hawaiians are prohably descended from the ancient Malay race which formerly inhahited a vast continent which many thousands of years ago was hroken up and depressed amid one of those mighty physical convulsions which have at long hut systematic periods of interval changed the form of continents hy upheavals and depressions of large hut local areas of the earth'e crust.

Later intermixtures of races may he traced, hy a careful study of traditional histories, among the different groups of the Polynesian Islands, which should now he carefnlly collected and preserved hefore the impending chauges of civilization, now moving westward, and permeating the whole area of the Pacific, allows them to fade from memory, or pass heyond recovery of scientific research.

To perpetuate such testimony of certain historical facts relating to the Hawaiian group of islands, on which the distinguished English navigator, Captain James Cook, attempted to impose the name of Sandwich Islands, hy right of so-called discovery, Hon. Henry A. Peirce who, for eight yeare past, has resided at Honolulu as Minister Resident of the United States of America, has prepared, at my request, a thorough reliahle etatement of the earliest discoveries of these islands hy various navigators of modern, commonly called western natione. Mr. P. has a thorough knowledge of the Hawaiian language; having learned it over 50 years ago, when he first landed upon those islands, in 1828, since which time he has resided there nearly quarter of a century, and conversed frequently with many intelligent natives who were present and witnessed the landing of Capt. Cook. His sources of exact information are therefore not only exceptionally good, hut are also most trustworthy and reliahle.

Mr. Brooks then read a detailed account, prepared hy Mr. P., of all the voyages where early navigators reached the Hawaiian Islands.

AVERAGE SPEED ON RAILROADS.—The average speed on English railroads is 46 miles an honr; on the French roads, 37½; on the German, 40, and on the American, 37. On the English roads, 6½-ft. driving wheels are quite common; and some of the fast lines have 8 and 9-ft. wheels, and one line has 10-ft. wheels.

Pacific Coast Affairs in Congress.

Ths House Committee of Conference on the River and Harbor Appropriation hill agreed, June 9th, to retain in ths hill all the Senate amendments increasing the amounts for Pacific coast improvements.

The House Committee on Military Affairs reported favorably, June 9th, the hill of Horace Davis, to allow the city of San Francisco the use of a portion of the Government reservation at Lime Point, hetween "The Points" and Point Covella, San Francisco harhor, for quarantine purposes, for such time and under such restrictions and regulations as the Secretary of War may require. The point sslected for the station was recommended hy the Secretary of War at the suggestion of Gen. McDowell, who thinks it morc conveuisnt and hetter adapted for a quarantine station than Angel island, which was first suggested.

Favorahle reports from committees on the following matters of interest to the Pacific coast were made to ths House. A hill to pay Edw. Vollum a sum not to exceed $700 for property lost when the hrig *Fawn*, hound for Fort Umpqua, Or., 1858, was wrecked. A hill authorizing the deputy-inspectors of customs at San Juan island, Puget Sound district of W. T., to enter and clsar vessels. A hill providing that the validity of any patents for puhlic lands shall not he questioned in suits or court proceedings after the expiration of 10 years from the date of issue, except when the issue was ohtained hy fraud or allowed hy mistake. The hill providing for ths survey and disposal of unsurveyed lands helonging to the U. S., was reported hy the House Committee on Puhlic Lands June 9th, to he printed and recommittsd.

Bills granting pensions to Rebecca E. Hasken, Mary J. West and Margaret Costello of S. F. were reported favorahly to ths House.

A DIGEST of decisions of ths Land Office in relation to mining laws; a list of patented mines; the laws regulating the disposal of mineral land; and the instructions of the Land Officc thereunder, are to he found in "Copps' Hand Book of Mining Laws," recently puhlished. This is a little work useful for every miner or prospector in the country. Price $1, for sale hy Dewey & Co., 202 Sansome street, San Francisco.

EVERY new suhscriher who doee not receive the paper, and every old suhscriher not credited on the lahel, within two weeks after paying for thie paper, should write personally to the puhlishers without delay, to secure proper credit. Thie is necessary to protect ourselves and euhscrihers against the acts and mistakes of others.

REPRESENTATIVE DAVIS, at the instance of the Bunker Hill Association of California, has procured an order from the Sec'y of War, directing that a Federal salute he fired on the 17th instant from all the forts in San Francisco harhor.

Pocket Mining Atlas,

Containing tbe principal mining districts in the United States. Complied from the latest official surveys and the most authentic sources by Edwin Bolitho. Sent, post-paid, on receipt of $1. Address, Dewey & Co., 202 Sansome St., S. F.

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Conferred upon tens of thousands of sufferers could originate and maintain the reputation which AYER'S SARSAPARILLA enjoys. It is a compound of the best vegetable alteratives, with the Iodides of Potassium and Iron, and is the most effectual of all remedies for scrofulous, mercurial or blood disorders. Uniformly successful and certain in its remedial effects, it produces rapid and complete cures of Scrofula, Sores, Boils, Humors, Pimples, Eruptions, Skin Diseases and all disorders arising from impurity of the blood. By its invigorating effects it always relieves and often cures Liver Complaints, Female Weaknesses and Irregularities, and is a potent renewer of vitality. For purifying the blood it has no equal. It tones up the system, restores and preserves the health, and imparts vigor and energy. For forty years it has been in extensive use, and is to-day the most available medicine for the suffering sick anywhere.

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Attend to This.

Our subscribers will find the date they have paid to printed on the lahel of their paper. If it is not correct (or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omissions of agents.

SAMPLE COPIES.—Occasionally we send copies of this paper to persous who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

EXTRA COPIES can usually he had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco.

News in Brief.

THE Empress of Russia died at St. Petershurg June 3d.

AN Oakland (Cal.) mother is happy in the possession of a one-pound hahy.

THE forests of the glohe ars estimated to covsr ahout ons-fifth of the land surface.

IT is said the phylloxera has appeared in Coimhra and on the Douro, Portugal.

THE wool clip of eastsrn Oregon will this season far surpass that of any previous year.

TWO Chinese girls 14 and 15 years of age committed suicide June 3d at Portland, Or.

AT this time in the National Treasury at Washington city there are 500 tons of silver dollars.

AT Coldstream, near Truckee, May 6th, 1,000 ft. of snowsheds of the Central Pacific were hurned.

THE ex-Empress Eugenie reached Zululand, at a point near where the Princs was killed, May 28th.

AT Nevada City, Cal., June 5th, a disastrous firs occurred which destroyed $50,000 worth of property.

PARIS omnihuses carry on an average 28 passengsrs. The averags distancs covered is five miles an hour.

SELLING cigars at a hotel on Sunday has heen decided hy the Supreme Court of Indiana to he a "work of necessity."

THERE are six schooners engaged in seal-fishing at Neah hay, W. T. The total catch this year up to June 1st is 4,469.

THE captain of a Canadian Cricket Club, playing in England, has heen arrested as a deserter from the British army.

THERE is a fund in Texas of $200,000 derivcd from the sale of puhlic lands, and set apart for the huilding of a State University.

ANDREW AIMERS, the oldest compositor in Scotland, lately died in Edinhurgh. He had helped to set up the Waverly novels.

THE wheat crop of California promises to he immense. The indications are that it will he the largest ever produced in ths State.

JOHN BROUGHAM, the actor, died in New York, May 7th. He was a native of Duhlin, Ireland, and in the 70th year of his age.

HERMAN LISSBERGER, metal msrchant and importer, New York, suspended, Juns 2d, with liahilities hetween $2,000,000 and $3,000,000.

IN the opiuion of the *Pall Mall Gazette*, Irishmen will he most likely to hecome as contented as Englishmen hy heing treated like Englishmen.

THE white sage is hlossoming finely in Los Angeles and San Bernardino counties, and a large yield of honey from thie eource is expected.

THE Merced *Express*, June 2d, says the valne of the canal is apparent on the sand lands near Atwater. On irrigated land the crops are splendid.

SENATOR BOOTH has heen appointed one of the congressional visitors at the annual reception and graduation exercisee of the Naval Academy.

IN thc past eight years the numher of marriages in Germany has greatly fallen off. Military service and emigration are douhtless the causes.

HARVESTING has commenced along the foothills of Tulare, and within 10 days horse-power and steam threshers will commence turning out the grain.

THE Del Norte *Courier* reports that some hoye of Crescent City recently cantured a water-snake, which had long, sharp teeth and preyed upon fish.

A SERIOUS accident occurred on the Berlin and Magdeburg railway, Germany, June 3d. A train run off the track, killing two persons and wounding 32.

A DEMURE, diminutive girl, aged 18, is under arrest in Philadelphia for higamy. She has three living hushands, all of whom she has married within two years.

THE Geary St. R. R. Co. claim to have carried 344,000 passengers last month. The receipts, therefore, would he $17,200. The expenses were $7,000.

CAPT. EDWARD COX, mnrderer of Judge A. Alston in the Capitol of Georgia, has heen put to work in the coal mines in Dade county under his life sentence.

AN effort is heing made in Mexico to induce the Government to declare as national property all of the archæological monuments and other relics in the republic.

CAPT. CLARK, of the San Simeon whaling fleet, has captured a whale in whose hody he found a harpoon which he fired into the body of the animal over two years ago.

A HANDSOME dome is to he constructed over the new capitol in Baton Rouge, La., hroad enough to accommodate a dancing party, at the hight of over 100 ft. from the ground.

THE Repuhlican convention for the nomination of candidates for the Presidency and Vice-Presidency met in Chicago, June 2d, and continued in session until June 8th. The candidates finally nominated were James A. Garfield, of Ohio, for the Presidency, and Chester A. Arthur, of New York, for Vice-President.

THE nunnery at Ehstorf, Province of Hanover, Prussia, celehrated the millenium of its foundation on March 22d. The church connected with it was huilt in the twelfth centnry.

AN elahorate series of experiments in a new system of suhmarine mining and torpedo warfare is ahout to he carried out at Bantry hay, Irelaud, hy several ships of the Channel sqnadron.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

DIVIDEND NOTICE.

OFFICE OF THE

Napa Consolidated Quicksilver M. Co.

No. 330 Pine St., Room 10, S. F., Cal.

At a meeting of the Board of Directors of the above named Company, held on THURSDAY, June 3d, 1880, a Dividend (No. 10) of

10 Cents per Share

Was declared upon the capital stock of the Company, payable on

Thursday, June 10, 1880.

WM. W. PARRISH, Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

San Francisco, June 2, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, Dividend No. 16 of Seventy-Five cents (75c.) per share was declared, payable on SATURDAY, June 12, 1880, at the office in this city, or at the Agency of the Nevada Bank of San Francisco in New York.

WM. WILLIS, Secretary.

Office—Room No. 20, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

Office of the Spaulding Gold and Silver Mining Company—A Stock Dividend has this day been declared, payable to the Stockholders of this Company, on and after the 10th day of June, of three shares of the Republic Mining Company's stock for each five shares of this Company's stock, on presentation of the certificates of stock of this Company.

JOHN HEIN, Secretary.

Office—117 Battery street, San Francisco, Cal. Saturday, May 29, 1880.

Spring Valley Water Works.

The Annual Meeting of the Stockholders

OF THE

SPRING VALLEY WATER WORKS,

For the election of Trustees for the ensuing year and for the transaction of such other business as may be brought before the meeting, will be held at the office of the Company on

WEDNESDAY, JUNE 16, 1880, at 12 M.

By order of the Board of Trustees.

WM. NORRIS,
Secretary.

Atlanta Mining Company.—Location of principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 29th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, May 21st, 1880, and day of sale to Wednesday, June 23d, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, June 24, 1880, and day of sale to Monday, July the 19th, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

Gover Mining and Milling Company.— Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Fifth day of May, 1880, an assessment (No. 42) of 20 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of June, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the Fourteenth day of July, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Palmer Ice and Refrigerating Company.— Location of principal place of business, San Francisco, California. Location of Works, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 2), levied upon the Twenty-First day of April, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Certificate.	No. Shares	Amt.
C C Palmer	7	200	$1,000 00
Wm E Wood	8	50	250 00
August Remmo	5	100	500 00

And in accordance with law, and an order of the Board of Directors, made on the Twenty-First day of April, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 303 Montgomery street, San Francisco, California, on Thursday, the Seventeenth day of June, 1880, at the hour of one o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

C. C. PALMER, Secretary.

Office—No. 303 Montgomery street, San Francisco, California.

REMOVAL NOTICE.

The office of the following Companies have removed to

No. 327 Pine Street,

The S. F. Stock Exchange Building, Room 8.

Belcher Silver Mining Co.,

Manhattan Silver Mining Co.,

Champion Mining Co.,

New York Mining Co.

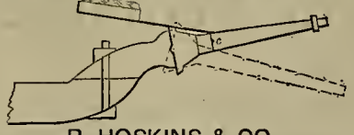
N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

Manufactory, 17 & 19 Fremont St., S. F.

Some fine sunny offices (next to the PRESS office), to rent (at very reasonable rates), by Dewey & Co., at 202 Sansome street, corner of Pine.

HOSKIN'S DEFLECTOR.



R. HOSKINS & CO.,

EMPIRE FOUNDRY, Marysville, Cal.

Manufacturers of Giaot's, Perkins & Hoskins Deflectors, Mill and Mining Machinery.

Amusements.

BALDWIN'S THEATER.

I'HOMAS MAGUIRE .....Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

MISS ADELAIDE NEILSON.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily

BUSH STREET THEATER.

CHAS. E. LOCKE.....Lessee and Manager

BOCCACCIO.

Open every evening and Saturday Matinee.

W. T. GARRATT'S

BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings

Hooker's Patent Celebrated

STEAM PUMP

☞ The Best and Most Durable in use. Also, a variety of other

PUMPS

For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF

IRON PIPE AND MALLEABLE IRON FITTINGS.

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES.

To Railroad Men, Mining Superintendents, Street Railroads and Lumber Dealers!

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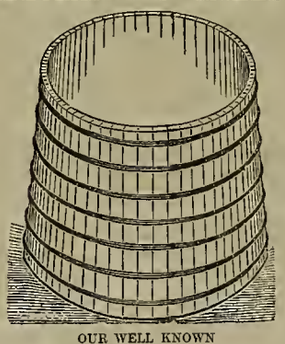

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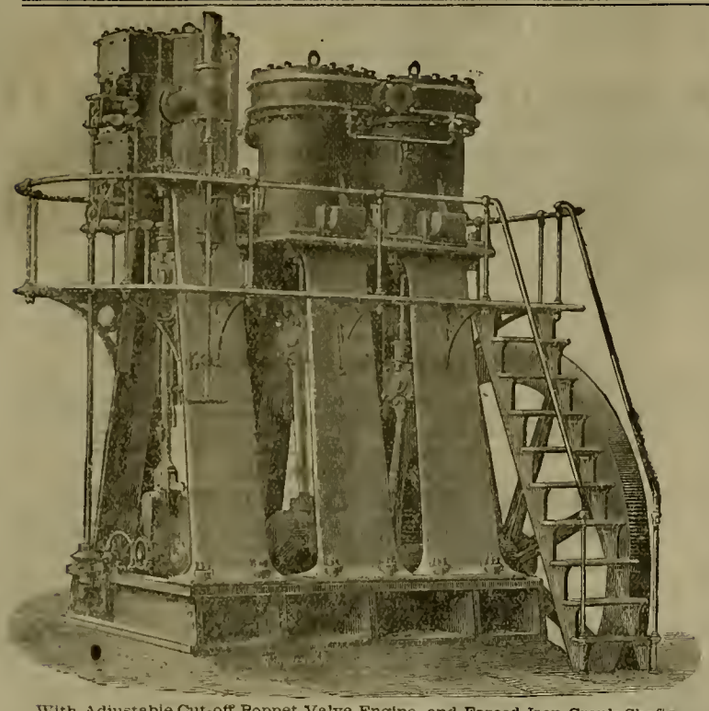

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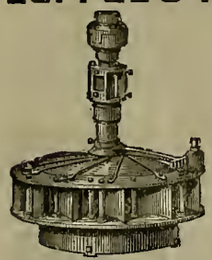

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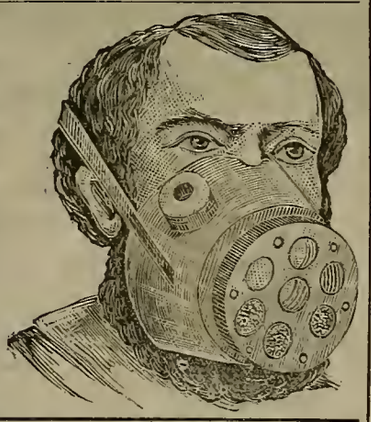

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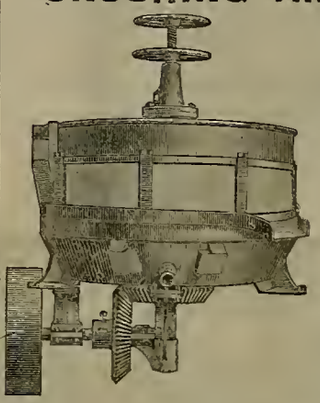

This pan is designed to receive ore direct from a rock breaker, and reduce it to the fineness necessary for amalgamation, thus taking the place of the ordinary stamp battery. The cost of this Mill places it within the reach of all; and one point of advantage not to be overlooked is the fact that the cost of erection, which adds so much to the expense of the stamp mill, after it leaves the foundry is, in this case, reduced to a fraction, as the Mill is complete in itself, and requires no expensive foundations, bed logs, battery frames, etc., but can be placed in position in a few hours after it arrives on the ground, without the aid of skilled labor. This simple arrangement, durable as it is simple, is a most important improvement in the working of gold ores, as it enables parties to construct and erect a mill at half the cost of a stamp mill, and with a great saving of time, and size of mill building. Each pan is capable of reducing 10 tons of average ore in 24 hours, the ore being first broken in a rock breaker, small enough to go through a half-inch screen. There is an important point in the action of this Mill, to which we desire to call the attention of miners and millmen. We allude to the grinding and scouring action on the gold before it is discharged. The value of this point cannot be over estimated, and it is not necessary to do more than mention the fact, as it will be at once recognized by all competent millmen who examine the pan in operation, and especially by those who have had to deal with tarnished or rusty gold, as it is commonly called, and which is often encountered in our mines, and which is such a cause of loss. The pan of feeding is the same as in the stamp mill, either an ore feeder or hand feeding being adopted, as may be desired. Parties interested in mining and mills can see the Pan in operation by calling at the OCCIDENTAL FOUNDRY, STEIGER & KERR, 137 First St., S. F.

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SAN FRANCISCO, SATURDAY, JUNE 19, 1880.

VOLUME XL Number 25.

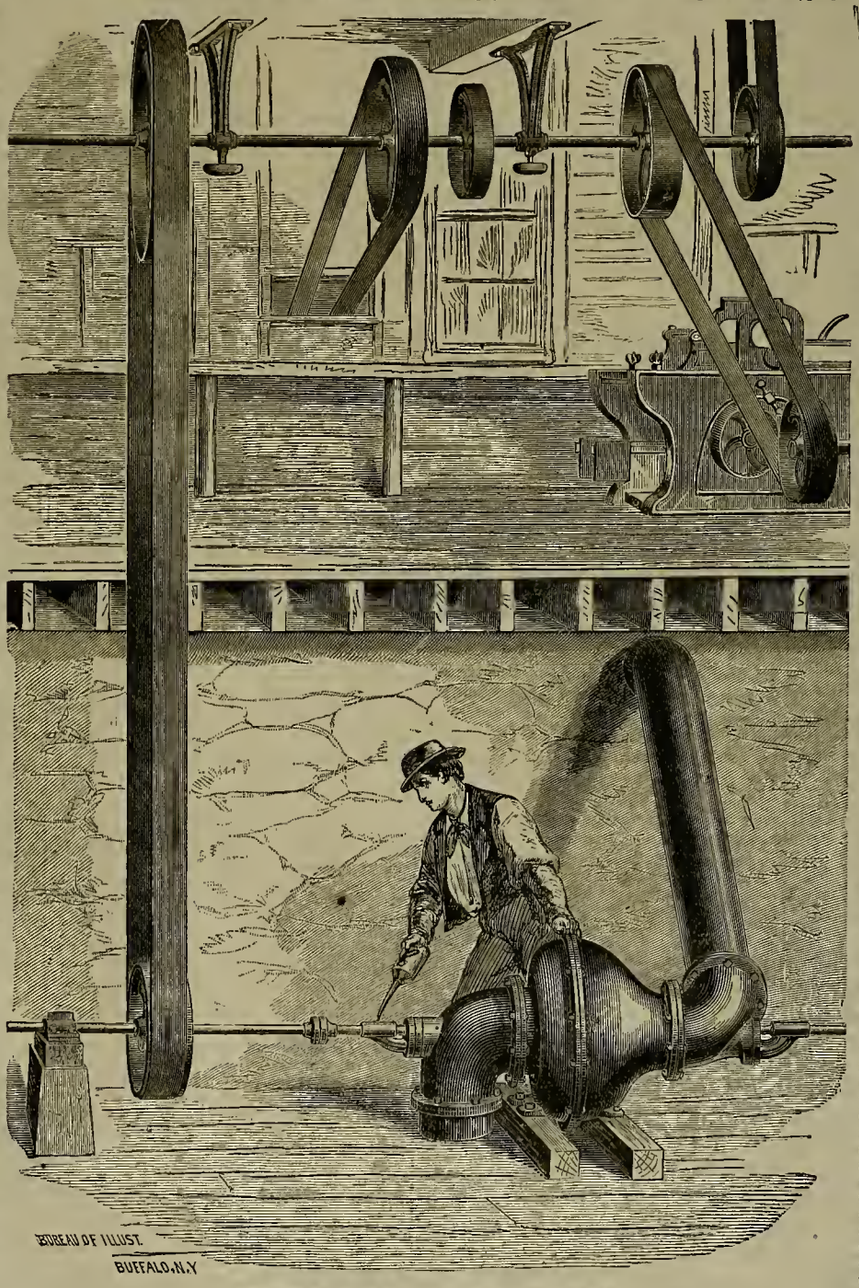
Morals of Silver and Gold Mining.

Mining for silver and gold has such undisputed antiquity, that by this time one would imagine it had acquired a well-defined status. Yet every now and then we find some one writing in defence of the industry in a half apologetic manner, and almost conceding that the business was a necessary evil. The use of silver and gold in some form is interwoven with the history of every people, and they will continue in use doubtless until the end of time. They have contributed so much to promote civilization that it seems doubtful whether it would exist in its present elevated form without their presence. The search for silver especially, and its mining and reduction, has been from the beginning a fine school of discipline. It is attended by such numerous obstacles that men have been taxed to the utmost of their power to overcome them. After one has found his vein and followed it into the depths, he is compelled to devise some new expedient to subdue the water which constantly threatens to flood his mine and destroy his labor. Having overcome this difficulty, he next finds himself unable to work for want of fresh air, and his highest ingenuity is brought to the task of supplying it. These and countless other difficulties which accompany mining and the separation of the metal, encouraged the study of the sciences, in order that the results obtained by observation and demonstration in the laboratory might be applied to the business.

Several of the most extensive engineering works connected with mining owe their existence to the search for silver. We need only mention a few that occur to us: The great tunnel for draining the Schomnitz mining district in Hungary was undertaken during the last century and is about nine miles long; the tunnel at the silver mines of Freiberg is eight or nine miles long; and the mining district around Clausthal is drained by a great tunnel—also begun in the present century and finished about 1835—some 12 miles long, which taps the mines about 1,000 ft. below the surface. These vast works were undertaken by government, and, considering the time and the conditions under which they were begun, they must be regarded as triumphs of engineering skill. And our own great Sutro tunnel, undertaken and carried through to the present day by private enterprise, is second to no engineering project of the time. It must be remembered that silver mining gave the impetus to these vast schemes.

Objection is made to gold and silver mining that the business is, now-a-days especially, associated with the stock exchange, and is in that way productive of evil. Many of the great and beneficent industries of every civilized community are obnoxious to the same objection. We all know, it is presumed, how railroads are built and manipulated. We have heard, it is supposed, of "corners" in wheat, by which not only the pockets of rich speculators were pinched, but likewise the stomachs of thousands of the innocent poor. But it would surely be a sorry reason for checking railroad enterprise or the growth of wheat because they were the occasional or habitual means of speculation. There is this to be said of speculation in mining shares—which leads, of course, like any other speculation to inflation and collapse and gain and loss—that it is not apparent how the stupendous mining operations on the Comstock could be prosecuted without the agency of the stock market. In fact, it may be said that there is no other practicable method of meeting the enormous assessments required. Under the present system, the mining share market impels the community through the instinct and hope of gain to a practical co-operation in the business of mining.

MINERALS IN MEXICAN GRANTS.—A large number of people still entertain the belief that the old Spanish or Mexican grants of agricultural or pasturage lands carried with them titles to all mineral land included within their boundaries. A notion has prevailed, too, that the U. S. Supreme Court decided in the memorable case of Fremont vs. the United States that such grants carried the mineral with them; whereas, the court did not pass upon the question in that case. The only question before the court then was the validity of the title, and whether there were any mines on the land, and if so, what were the rights of sovereignty in them, were questions to be discussed in another form of proceedings. This point, however, was decided, in 1862, in the case of the United States vs. Andres Castillero. The court decided that Spanish or Mexican titles to land for grazing or agriculture did not embrace a title to mineral land, and showed that not only Spain and Mexico, but most all nations of Europe and America, retained complete titles to all mines and minerals in lands granted for pasturage and agriculture.



IMPROVED HORIZONTAL MINING WHEEL.

LAST YEAR, says the Yankee Fork *Herald*, Idaho produced nearly $500,000 in bullion more than Arizona, about two-thirds as much as Montana, and about half as much as Utah. This estimate is made without reference to the ore shipped out of the Territory for reduction.

New Improved Horizontal Mining Wheel.

We give on this page an illustration of a comparatively new method in the application of turbines to mining purposes. For many years wheels have been located in horizontal positions, proper arrangements being made in each instance to suit the circumstances. The illustration gives a view of a new design and casing, a convenient modification of the "Patent Globe Case," which has been in use a number of years. The object attained in this new arrangement is economy of space and the application of an extremely small inlet and head-pipe, this latter being accomplished by a peculiar arrangement in the upper or interior part of the casing. The new design affects also a great saving of power, by means of the use of anti-friction bearings, which can be oiled, the whole being accessible and subject at any time to examination. The design is intended particularly for mining purposes and for small wheels under high heads, where the use of gears is not only difficult of arrangement and of keeping in order, but frequently impracticable otherwise.

The horizontal shaft of the water wheel on which is placed a pulley, affords not only the simplest, but the most efficient means of connecting the power to the point where it is desired to be used. This is easily effected, and any amount of power transmitted and motion obtained that may be desired, by properly proportioned pulleys, with light but sufficient belting. The method is not only applicable to mining purposes, but frequently may be attached to saw-mills and other machinery where a simple and efficient arrangement is desired. The improved horizontal wheel is admirably adapted for mining, pumping and other purposes, and where it is desired to have the greatest power in the least possible space, having the smallest conducting pipe that can be used and the simplest communication of the power to the work. The Pacific coast agents for this horizontal mining wheel are Messrs. Parke & Lacy, 21 and 23 Fremont St., S. F.

AN UNSETTLED QUESTION.—One important question to miners which has never been satisfactorily settled is, what constitutes $100 worth of labor and improvements? We often hear of trouble resulting from claims being jumped by parties who hold that the necessary amount of work required by the U. S. statutes has not been done in the manner prescribed by law. Some persons have expended annually $75 or $80 for actual labor and $20 or $25 for tools and other material, making the total of $100. The parties who have relocated such claims hold that actual labor to the value of $100 must be performed, independent of cost of material used, etc. The law on this point is not very definite and allows of a liberal construction. The following is the literal reading of the statutes: "On each claim located after the 10th day of May, 1872, and until a patent has been issued therefor, not less than $100 worth of labor shall be performed or improvements made during each year." This point as it now stands is liable to cause considerable litigation. The Commissioner of the General Land Office has never, to our knowledge, decided as to whether the money expended for powder, fuse, tools, etc., can be counted as part of the $100 worth of labor required. Until such decision is rendered, miners will have to be controlled by the by-laws of their own districts, each mining district being accorded the right to make regulations for its own government, not in conflict with the laws of the United States, or of the State or Territory in which the district is situated.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Tulare and Kern County Mining.

Editors Press:—Many of your readsrs will remember the White River mining excitement of 20 years ago and more, which caused a rush of proepectors to that part of the foothills of the Sierras that now lie on hoth sides of the houndary line hetween eastern Tulare and Kern Cos. For a time the White River mines were all the rage. Considerahle gold was taken from the placer mines along White river, Grizzly gulch, and other canyons, where sufficient water could he had. The largest nugget found was in a emall guloh in sight of what ie now White River P. O., or what was hetter known in early days as

"Tail Holt."

Thie nugget wae worth over $400. Long siuce, however, the general intereet in these mines died away, the prevailing impression heing that they were "worked out."

The regular rounds of your correspondent have lately taken him to this region, and the same fact was impressed upon his mind that he learned and expressed in your columns eome years since, when traveling up the Yuha river, through Downieville and Sierra City, viz: The frosts and rains of each winter are disintegrating our gold-hearing eoile and rocks, and washing them down into our canyons and gulches, thus euppIying the old placer mines again with gold. It seems, too, that in eome localities where these placer diggings are lcft undisturhed for several years, they almoet attain their formcr richness. Consequently when as wet a winter comes on as the last, euch placere can he and frequently are worked over with considerahle profit. This re-working of the placer mines of California and its henefits fall chiefly to the lot of our Chinese population, who are unquestionahly good miners, as they are first-class gardeners. In illustration of this fact, I am reliahly informed hy C .T. White, mining recorder of this district, that last winter, nuggets worth from $25 to $40 were found in White river, just hslow the postoffice, hy some Chinamen, while othere of them took from Fine Gold gulch, near hy, three nuggets, valned together at $50. Mr. White saye rich float ahounds in White river, as much so as in any stream in California. Yet most of the gold here is fine, rather than coarse.

No Systematic Mining

Hae heen done in this district of late years. Yet 20 yeare ago a large amount of mining was done here with arastras. Usually no shafts have heen sunk more than 10 to 30 feet, though 12 yeare ago one was put down 90 ft. There is running water in White river ahout 8 months each year. It heads only eome 12 miles ahove the poetoffice. From Mr. White I also learn the following facts: The ledges on Bald mountain, ahout two miles east of White River P. O., are well known. Along the surface of the main lead for three miles at eight different points, ore has heen lately taken that yields from $20 to $500 per ton. The gangne rock in the lower hills is slate, in the higher ones granite. Claims can he hought along this ledge for $1,500 to $2,000 now, whore the prohahle average yield would he $100 per ton. Any one wishing further particulars ahout these and several promising new ledgee, can gain the desired information from Mr. White at the office ahove named. He helieves a little ready capital is all that is needed to make good profits from these ledges. He asserts that monntains of gold-hearing gravel exist ahout Posa creek, Gordon's gulch, Rag gulch, and Willow springs. In prospecting, these pay all through them from ½ cent to 12½ cents per pan. All that is needed to get good profits hy working them is water enough for the hydraulic process. Enough can he hrought for this purpose hy a ditch 25 miles long from the north fork of the Kern river. Or at a distance of 10 miles on heade of Deer creek and White river plenty of water can he had for six months of the year.

The gold-hearing ledges on Bald mountain vary from one inch to six feet in width. As you go down on them some "pinch out," othere widen. Few have heen examined to auy depth.

An Odd and Very Promising Ledge

Of dieintegrated and decomposed gold-bearing quartz, was found last year hy Thos. Williams and partners. It is located on the southern elope and near the top of what they now call Bowlder hill. This hill is a prominent point among the foothills about five miles southeast of White River P. O. It is immediately north of Blue mountain, and separated from that ridge hy Grizzly gulch. The rough hill, eparsely covered with scrubby pines and oaks, is, in the main, a mass of huge granite houlders. Learning that much of the dirt around the ledge yielded $4 in gold to the pan of dirt, your correspondent wished to examine it, and made his way to it on horsehack over the narroweet and most rugged of traile, and across ridges without trails. There, after a rough, wearisome climh, he found Thos. Williame and W. H. Popple, present owners, and Wash. Williams, one of the first discoverers, finishing a horse arastra that was to hegin work next day on 40 or 50 tons of finely-hroken, reddish quartz, like rosin mixed and set in a whitish cement. An odd feature is that all of thie, whether quartz, or clay, or decomposed granite, whsn crushed and washed in a minsr's horn, shows a large psrcentage of fine, pure gold. It is estimated that this ore will average from $50 to $100 per ton. These men first located the ledge in June, 1879. Thsy found evideuces of prospecting nsar it that was prohahly done as long ago as 1857. They named the first ledge found Vulture, hut are now working on its southeru extension. Here they have a tnnnel 140 ft. in. Throughout thie distance the ledge proves to he from 8 to 30 inches wide.

A Geological Description

Of this ledge and its surroundings hy Oliver Cox is in suhstance as follows: The period of formation is Jurassic. It contains gold commhined with hisulphide of iron, hematite and hydrous oxide of iron, with traces of galena. Associated with these are talc, porphyry, kaolinite and feldspar. It is encased in much semi-decomposed granite. The surrounding rocks are granite with porphyry dikes, greatly disturhed, evidently hy earthquakes and other volcanic action. A percentage of silver in the gold makes its valne $14 per ounce. Placer gold around the ledge in the debris carried down in the Pliocene period.

Mr. Williams informed me that the water for their arastra will he supplied from a shaft eunk 40 ft. deep on the ledge ahout 200 ft. above the arastra, which is near the mouth of tho tunnel. Wator will he brought out hy lead syphons and pipe.

Ledge rune nearly north and south and dips east hetween 30° and 40°. It is in the northern edge of Kern county. The tunnel and arastra are from 800 to 1,000 ft. ahove the hed of Grizzly gulch. The hight ahove eea level is, perhaps, not far from 2,500 ft. The view of San Joaquin valley, with Tulare, Buena Vista and Kern lakes, and the Coast range in the distance, is very fine on a clear day. We may reasonahly expect to hear a good account from this uew mine. I have heen shown hy Charles Winkler, former engineer in the Sumner miue, at Keruville, specimens of a very finely grained clay, not unlike kaolin, or more like ocher, in that quite a variety of distinct colors is found in the same ledge. These colors are hright red, like cinnahar, yellow, lilac, hluish and white. A emooth surfacc when dry, has a glossy look and smooth feeliug like soapstone. It hes heen tried for paints, and found to work well. Can it not he utilized in the manufacture of paints? So large is the ledge, it can furnish many thousand tons. It is fouud upon the hlnffs of Kern river eome 15 miles from Sumner on the S. P. R. R. Any one wanting farther information ahout it, can inquire of Mr. Winkler at Bakersfield. J. W. A. W.

Kern Co., June 4th.

Silver in Shasta County.

Editors Press:—Thcre are wonderful things in the country as well as in the city. People raised in the city are as awe-struck hy what they see in the monntains as our country cousins are hy what they see in the city, and our country cousins enjoy our exhibitions of verdancy as much as we do theirs when we see tbem "gawking" at ohjects familiar to us in the city. Upon the whole they have us rather at a disadvantage. Our wonders are artificial, theirs are natural. It is easy to understand and comprehend art, but nature is inscrutahle. Dnring our trip hy private conveyence, through the valley to the mountains, a distance of 300 miles or more, good crops and juhilant farmers were found everywhere. The ahundance of the wheat crop is simply wonderful. Heretofore when the fields promissd ahundance, the farmers would fret and worry hecause the abnndance of the crop hespoke hard work and low rates, or a meager crop high rates. The firet promised hard work and little pay, the latter moderate compeusation and less work—the latter to he preferred; hut now they all seem willing to work, expecting fair prices.

Sacramento county will grow larger crops and more of it than any year previous; even the red hill land has an ahundant yield. Placer, Yuha and Butte, alwa's celehrated for their great yields in their rich river hottoms, will reach far ahead of any previoue year. Tehama will he no exception to the general rule, and Shasta, where more water falls than perhaps any other county of the State, wherever there is arahle land, will do her full duty.

The mines never looked more promising, and old gruff prospectors who heretofore would sit down and growl that the Chinese have taken possession of the country, are now scratching their sleepy eyes and are talkiug quartz, leads, silver, gold, porphyry, slate, and even are heginning to know more than the experts. A new era is dawning on our mining regions. Where heretofore they expected to fiud ouly placer diggings, is now fonnd the most valuahle quartz ledges, and where only gold was expected, rich silver mines are found.

At this particular time and in this part of Shasta county the silver hoom is up high, and such expressions as the "most extensive, richest and most valuable silver ledge the world has ever seen" are frequent.

Some five or six miles from the ancient and dilapidated town of Shasta, was known to exist what was called the Iron mountain. Nothing was expected of it, and no one prospected thsre. A curious expert came from tho city and has heen secretly looking at its formations, assays have besn made of his finds and now the whole country is wild and claims are staked off for miles. A new silver belt has heen discovered, the assays of which go away up into the hundreds. The mountain is inhabited and the sleepy miners are all awake and alive to ths new interest. I will soon visit it myself, and when I have tested its quality will give yon the rssult of my investigations.

A. Myers.

Whiskytown, Shasta Co., June 3, 1880.

Meadow Lake District.

Editors Press:—We have heen ramhling and have fallen, or rather stumhled upon the old, aoandoned and much ahused Meadow Lake mining district. Although at one time there were thousands of people in this district, for years it has lain unnoticed, except when some venturesome individual has pitted his intelligence throngh means of some complicated process against its rehellions ores. Now, however, indications are favorahle for a revival of the old camps thereahouts, as it has heen practically demonstrated that the ores are not only rich, hut can he cheaply worked. Realizing this fact, the

Cieco Con. Gold Mining Co.

Have eecured hy location and purchase the following named claims, each containing 1,500 linear ft.: the Badger, Riddle, Blackhawk, Charlick, Last Chance, Cisco, Reynolds and Keystone, all of which, except the Keystone, are situated on Red mountain. The Keystone was formerly called the Eclipse, and ie situated near Meadow Lake, while the others are from three to five miles from the lake, hut show the eame character of ore and country rock.

This company is incorporated under the laws of the State of New York, with a capital stock of $10,000,000 divided into 100,000 ehares.

They have heen and are still engaged in working the Badger claim. They have reached the ledge hy means of a tunnel, and have crosscut it for a distance of 34 feet, all good ore, and at present have uo indications of reaching the foot wall. The ehaft they are now sinking is down 70 ft. in ore all the way, hut no crosscuts have heen run to determine the width of the ledge. The first 15 aseays made from the croppings and working level, averaged a little over $290 per ton, some of it running as high as $690.

Machinery has heen ordered from the East to work the ore, of which they have a vast amount on the dump, and it is expected to arrive daily. When it does the mill will he erected as speedily as possihle, and ere long we shall douhtless hear of the payment of dividends hy this company.

Across Red Mountain

From thè Cisco Con. Co.'s works we reach the U. S. Grant mine. The mill of tbie company, which was crnshed hy a snowelide in April, ie heing repaired, and as soon as it is in running order the music of its stamps will be heard. They have an eight-ft. ledge giving eplendid assays.

The Gazelle Mining Co.,

Owning an extension of the Grant location, are developing their property, and have great confidence in its future value. The ledge where they are working is ahout 30 ft. wide and givee good assays.

Other mine ownere are waiting for the ground to dry out a little more hefore commencing work, and hefore next fall there will he many mines hrought to pnhlic notice on their actual merits that have heen unnoticed for years.

A. B. C.

Truckee, Cal., June 7, 1880.

Chinese Steel.—A considerahle steel-making industry exists in the present day in China, on the Upper Yangtze, wbence the eteel ie sent to Tient-sin for shipment and distrihution. It fetchee much higher prices than the Swedish steel imported into the country. The Chinese metallnrgists recognize three kinds of steel—namely, that which is produced hy adding unwrought to wrought iron while the mass is suhject to the action of fire; pure iron many times eubjected to hre; and native steel, which is produced in the southwest. The different namee for steel are twan kang, or hall steel, from its rounded form; kwan kang, or sprinkled eteel; wei tee, or false eteel. The Chinese, apparently have known how to manufacture steel from the very earliest ages, and in the time of the Hau dynasty ironmasters were appointed in several districts of the old Leangchou to superintend the ironworks.

A Paper-Mill Project.—The Los Angeles *Express* advocatee the starting of a paper mill in that city, and enumerates many advantages existing there, such as plenty of pure water—an essential in paper-making; a fair article of coal from adjacent mines, which can he delivered at $6 per ton; an ahundance of straw, to he had at nominal rates; great quantities of rags and waste, now ehipped to San Franciseo at a meager profit; and plenty of idle capital and unemployed lahor. The most important advantage mentioned, however, is the fact that a fiher of a cactus, which growe in ahundance on the Mohave deeert (accessihle hy rail), has heen demonstrated to make an excellent pulp for white paper. These are certainly good reasous why such an enterprise ehould he considered, and, under the proper auspices, capital from San Francisco might possihly he enlisted in it.

Sensible Advice.

One good corrsspondent, who wonld faithfully and psrsistantly present the claims of sach mining camp to the Eastern capital that lies hoarded up, and to the Eastern intelligence that is quick to catch all the advantages, and ou the alsrt to avail itself of opportunitiss for profitahle investment, would hs of incalculahle valus to the mining indnstry of this country. The people of the East are eagerly ecanning the mining field, every avenue of information is hesieged for news. The papers here devoted to tbe mining interest are glad to pnblish facts from any great mining field. The people hcre care nothing for ramhling, windy letters from the professional correspondent who knows nothing of what he writes except the business coaches of the deadheading railroad and the accommodations of the advertising hotels. They want the facts written rather hy the clumsy hand that has wrung the pick all day in the mine, or hy the man who has personal or practical knowledge of the country, and the minerale of which he writes. There are thousands of dollars to-day in many Eastern citiee that would go into the development of a mine at once if one-half of the certain advantages which hundreds of localitiee possess would he made known and substantiated. Hundreds of rich mining camps are slowly dying out or harely clinging to the ragged edge of exietence for the want of capital that would hasten to vitalize and fill them with prosperous activity, if their real value and promise were only presented in a light that would attract and hold the attention of thousands seeking favorable opportunities for investment. There seems to he a feeling in eome portions of the mining country that the times aro hard and capital is slow to reepond. The facts are that there prohably never was greater activity manifested in every line of industry in the East than at present. There never was a time when so much hoarded capital was seeking the channels of husiness, and never a time when so much favorahle consideration has heen given to mining investments hy the husiness men of the country. It doee not matter how valuable and rich the prospecte and mines of any locality may he, if the facts of its existence is not known. The advantage to a district and the certainty of success depend largely upon the amount of knowledge disseminated concerning it, and the attention it has heen ahle to attract. Many rich and promising districts are lauguishing for capital. Capital is rusting in crowded vaults hecause an opening has not heen presentcd. Let a liue of communioation he opened up hetween them, and a mutual henefit will he the immediate result. Miners, write of your prospect holes, write of your mines, write of your district, write of your State, of the minerals, of the rock, of the assays, of the depth, of the value, of the improvements, of your needs, of anything that will he of interest to those who are anxious to learn the exact condition and promise of your district. Men, money, mills, mails and towns will come rapidly to those places which keep their advantages hefore the puhlic. Let your light shine.—*Mammoth Herald.*

Capital and Commerce.—What are the forces that keep thousands from starving in England to-day? Are they not the forces of capital and commerce? Who are the men that thne feed the hungry? Are they only the philanthropists, the reformers, the advocates of this or that panacea for the ills that affiict humanity! Far from it. They are the Garretts, the Scotts and the Vanderhilts, the Cunards, the Allane and the Leylands, and all the less-known memhers of the unlearned profession, who, perhaps aware of, or more or less ignorant of, their true function, are yet the agente hy whose work natione are sustained. No henevolence, no almegiving, could possihly reach the need; and if it could, it would pauperize those who received, and ruin those who gave—it would work hoth moral, mental and material degradation. It is hy the use of capital that the vast crope of the great West are produced; it is hy the nse of capital that they are moved; and it is the work of commerce, condncted hy husinese men seeking woalth for themselves only, that distrihutes the vast stores over wider and wider areas, and thus renders the struggle for exietence less arduoue for each eucceeding generation of men. We are more nearly a nation of shop-keepers than any other, and we may well be thankful for the distinction.—*Atlantic Monthly for June.*

Swelling Clays.—A great nuisance iu mining on the Cometock are the swelling clays that are occasionally encountered. They move in all directions. Often they rise np from the hottom of a drift or tunnel and displace the track. Cut down the clay and level the track, and it is hut a short time hefore the same work must again he done. In a tunnel in American Flat au account was kept of the different cnttings, and it was found that over 30 feet was cut off hefore it ceased to rise. In places along the Sutro tunnel this epecies of clay is giving a good deal of trouhle; the same is also the case in the Union ehaft. The clay may either rise up from the hottom of the drift or push its way in ou one or hoth sides. Some have compared the creeping of this epecies of clay to the motion of a glacier, hut it ie more like the swelling out of a piece of some pithy or spongy substance that has heen suhjected to powerful pressure. All that can he done is to keep cutting it away as long as it crawle out and gives trouhle, until it has lost its elasticity or the power hehind can no longer force it forward.—*Territorial Enterprise.*

MECHANICAL PROGRESS.

Tempering Steel.

Twn nf the most important processes in blacksmithing are the hardening mid tempering of steel. Great judgment particularly, as well as experience, is required to temper dies and tools. With good judgment, a person will soon learn to temper; and without judgment, tempering can never be successfully learned. A man may learn to do one special kind of work, but put him in a large manufacturing establishment, where all kinds nf dies and tools are used, with hardly any two requiring the same temper; and without judgment, the difficulties connected with such a position can never be overcome.

To harden and temper a piece of steel, it should always be properly annealed; otherwise it is almost certain to spring or warp. It is a very general idea that you can draw all the temper out of steel, without heating it red hot all over; but such is not the case. Heating the face of a die and covering it up in ashes does not thoroughly anneal it by no means. Possibly in that way you can get it in such a condition that it can be worked; but it will not be very soft, and will not harden and temper as well as if it had been heated all over.

The best way to anneal steel (when you do not have a kiln for that purpose) is to heat it all over in a slow charcoal fire; the slower it is heated the better. Do not heat very hot, but all over and all through. Then take it out and cover it up in fine charcoal, and let it remain till cold.

In heating a die for the purpose of hardening, it is not necessary to heat it all over, unless you want to harden it all over. The only way, in my judgment, that dies can be tempered as they should be, is for the one that tempers them to see, from time to time, how they work, as they are being used; and in that way he can tell if they require more or less temper and the particular places where they should be hard or soft.

It is useless for any one to undertake to tell how to temper anything that is used in a manufacturing establishment; such knowledge can only be acquired by experience, combined with good judgment and mechanical ingenuity. I will try, however, to explain my way of hardening and tempering.

Trip-hammer dies may seem very easy to handle, but a blacksmith without experience would meet with many difficulties. Take, for instance, a die seven or eight inches long, one and a half inches thick and four and a half inches wide with several impressions cut in it, leaving several small points which are liable to fly off as soon as they are hardened or when you are drawing the temper. Now, my way to prevent the corners from coming off, and keep the dies straight is this: I heat my die very carefully in a clean charcoal fire, being careful not to get it any hotter than is necessary to have it harden. When the proper heat has been obtained, grasp it with the tongs near one end in such a way that it can be put in the water perpendicularly, and while in the water I turn it to a horizontal position and take it about halfway out, letting it remain until it is cool enough on the face to take out entirely for an instant without permitting the temper to run down. Then I withdraw it and return it to the water several times very quickly, until it is cool enough to take out and scour off. The temper can then be drawn to suit, without any danger of the corners flying off.

The object in putting it in the water perpendicularly is to keep it straight; and, as it cools off all alike, when you bring the back out of the water the heat rushes up towards the back, and expands it, taking all the stianie off the face of the die and preventing it from breaking.

By plunging it into the water and withdrawing it very quickly, the face of the die has time to get cool gradually, and the corners are thus prevented from flying off.

This process will work well on any dies or tools hardened in this way. I have tried it hundreds of times with the best success.—*Cor. Blacksmith and Wheelwright.*

Effect of Use Upon the Quality of Iron. In the summer of 1878 Prof. Banschinger superintended some repairs upon a chain bridge which had been built in 1829. He examined several of the links by various tests, and found that there was no evidence of any diminution in the strength of the iron, nor of any change in its structure or its elasticity during the use of nearly half a century to which it had been subjected. In 1852 von Pauli tested several bars for another bridge, which was repaired in 1878, when Bauschinger subjected some of the same bars to new tests. He found that the mean strength was still the same, after 25 years' use, and that no change of structure appeared to have occurred since the time of von Pauli's original tests.—*Dingler's Journal.*

Spectacles by Machinery.—It is said that there is but one establishment in this country for the manufacture of spectacles by machinery, and that is located at Reading, Pa. The glasses are not only ground by ingenious machinery run by steam power, but the frames and all the processes needed to complete the spectacles are wrought by mechanism.

Making Riveted Sheet and Plate Iron Pipes by Machinery.

Machinery for the production nf finished tubes or pipes made of sheet or plate iron is now in successful operation. The sheets nr plates nrs first cut or rolled into strips nf suitable width, a machine then rivets or welds them together, forming a continuous length; thus prepared, they are fed into another machine, which forms, punches and rivets them, delivering a finished tube in one piece, the length of which may hs extended indefinitely and sawed off as required. In pipe or tnbes made by this process the seam takes n spiral form—uniform interior diameter, being secured by an offset on the outside edge of the strip eqnal to the thickness of the sheet or plate used. Senms thus constructed are superior in strength to the body nf the iron, and add greatly to the rigidity of the pipe, which also has the advantage of the tonsile, instead of the transverse strength of the sheet, for which reasons a tube made of ¼-inch iron, with a spirnl seam, would resist as great a bnrsting etrain as one made of soant ⅜-inch iron with a straight seam, thus effecting a saving of over one-third in the material employed. Recognized engineering authorities give the strength of a longitudinally riveted soam to be only about 55% of the strength of the iron of which it is made.

Recent tests of spiral seam pipe, made up of galvanized sheet iron and regalvanized after formation, gave, upon a Belfield gauge, the following extraordinary hursting pressures :

12-inch	pipe of	No. 16	gauge iron	450	lbs.	per square.
8	"	" 18	"	490	"	"
6	"	" 18	"	650	"	"
4	"	" 20	"	750	"	"
3	"	" 20	"	900	"	"

As yet no heavier iron than No. 12 wire gange has been used, hut experiments having proved the applicability of this system of manufacture to the construction of pipes for hydraulic engineering, boiler shells and flues, and other cylindrical strnctures for purposes demanding heavy pressures, provision is being made for extending the production in that direction, the chief advantages being the saving of expense over hand labor, the better quality of work produced and the economy in material. The lighter kinds of the spiral pipe are attaining a very general use for leaders, ventilating shafts, blown and suction fan connections, furnace pipe, smoke stacks and a great variety of uses in connection with house construction.

Pernot Steel.—A correspondent in Johnstown writes as follows: Pernot steel, until lately, has been known in this country only hy name, hut its manufacture has been commenced this year, on a large scale, at Johnstown, Penn. As is well known, the Siemens gas regenerators have been utilized for making open-hearth or Siemens-Martin steel, and also for melting crucible steel, but their application to this new improvement threatens to supersede hoth grades. The quality is fully equal if not superior to crucible steel for most purposes for which that has been used, and the expense of manufacturing decidedly less. In each furnace is a pan that can contain 20 tons of steel, which is revolved by a connection with the engine employed for that purpose. After the pan is charged, the gas flames playing over and around it hring the contsnts to the desired state of fusion, while the revolving of the pan causes the most intimate intermixture of the ingredients; thus overcoming the objection to melting steel in larger receptacles than crucibles. The operation is completed in a little more than five hours. The only concern that furnishes merchant steel made hy this process in the United States, is the Gautier Steel Co. Limited. They are preparing to furnish 40,000 tons per annum of this grade, which will be almost entirely additional to their present production.—*American Manufacturer, Philadelphia.*

Spence's Metallic Compound for Pipe Joints.—In our issue of April 3d some allusion was made to the new metallic compound, known as Spence's metal, and the various important uses to which it seemed applicable. Among others it was said to be peculiarly applicable for making joints in water and gas mains. According to the London *Journal of Gas Lighting*, it appears that subsequent experiments and observations go to show that owing to the hrittle nature of the metal and its rapid cooling, it will be inapplicable for such purpose. Still there are many uses to which this new compound may be put, which will nndoubtedly aecure for it a large commercial value and very general use in the arts.

An improved foundry ladle is described hy *Engineer*, hy the use of which, it is claimed, the production of clean castings is considerably facilitated. The ladles are made of wrought-iron, and have at their side, near the bottom, an opening which permits the iron to enter a lip riveted along the side of the ladle. The probability of any surface scoriæ getting into the mold is thus prevented.

To Discover Flaws in Shafts or Defects in Welds.—The *Blacksmith and Wheelwright* in referring to this subject says that if a piece of iron appears to have an unsound weld, or if it has a crack apparent upon the surface and it is desired to know how deep it penetrates, heat the part to he tested to a red heat and pour a fine stream of water upon the faulty spot, hut mainly on one side of it, and the iron on that side will lose its redness more rapidly than the other side, and plainly indicate how deeply the defect extends.

SCIENTIFIC PROGRESS.

The Milky Sea—Character of the Phenomenon.

Ths phenomenon of a milky sen has been known to occur in certain parts, hnt has not been very thoroughly scrutinized. Soms havs cnnsidered the luminous appenrancs in question an electric effect in thunderstorms; othsrs havs attributed it to cadavaric decomposition of marins animal and plnnts; others to abundant spawn, with fishes moving ahout in it. But ths truth appears to be that it resnlts from an accumulation of nnimalculæ capable of becoming phosphorescent, spontaneously or by friction. Some interesting information on the subject, (of nn exact character) has been recently published hy Liout. Poornaim, of the Freuch iron-clad *L'Armide*, which in February met with a milky sea in the passage from Point de Galla to Aden. The nights of Febrnary 9, 10, 12 and 13 were characterized hy the phenomenon in all its splendor, the ship during this time traversing 660 miles (1,100 kilometers) in a mean latitude of 12° north hetween the meridians of 61° and 51° east longitude. There was no thnnderstorm, the sky was clear, the moon new, the barometer, the thermometer and hydrometer were regular, and a gentle northeast monsoon was blowing. The temperature of the surface of the water was constant at 25°. The sea was like a snow-covered field in a clear night, and all trace of nndnlations was lost sight of. The milky look was hardly disturbed hy the motion of the ship and working of the screw (which shows that the layer had considerable thickness. By day all disappeared; hnt the hue of the sea was somewhat altered. Looked at attentively over the ship's side at night the water was seen to contain an enormous numher of luminous particles pressed closely together, and more brilliant close to the side where disturhed. Some 400 of these corpuscles, one or two centimeters long, conld be connted in a bucket holding 10 liters of the water. Drawn out, these were seen to he of gelatinous snhstance, which dried quickly and disappeared, leaving a dark glohule one millimeter in diameter, which, in the microscope, presented a transparent ovoid animalcule filled with eggs, and moving its fins and tentacles incessantly. A drop of water added to the dark glubule brought back its luminosity, and when the creature was bruised in the hand it gave a bright mark which was quickly extinguished and which had no smell. The milky water kept till day and looked at in the dark, showed no luminosity even though agitated; nor does the water procured hy day and hronght into darkness. It remains to be determined what causes the luminosity of these animalculæ, and the information is also desirable as to the position of the various milky seas on the globe, the times of their appearance, whether they persist or not in the same place, etc. Several of the officers on board *L'Armide* had witnessed the phenomenon hefore, hut never so brilliant or continuous. The *L'Armide*, in going out, had passed 30 leagues further north in Feh., 1878, without encountering anything of the kind.—*London Times.*

Premium for Scientific Research.

Uriah A. Boyden, Esq., of Boston, Mass., has deposited with the managers of the Franklin Institnte of Philadelphia, the sum of $1,000 to he awarded as a premium to "Any resident of North America who shall determine hy experiment whether all rays of light, and other physical phonomena, are or are not transmitted with the same velocity."

Among the conditions is the reqnirement that each competitor must transmit to the Secretary of the Franklin Institute a memoir, describing in detail the apparatus, the mode of experimenting, and the results; and all memoirs received hy him before the first day of January, 1881, will, as soon as possihle after that date, be transmitted to the Committee of Judges.

The Board of Managers of the Institute shall, before the first day of January, 1882, select three citizens of the United States, of competent scientific ability, to whom the memoirs shall be referred; and the said Judges shall examine the memoirs and report to the Franklin Institute whether, in their opinion, and, if so, which of their memoirs is worthy of the premium. And, on their report, the Institute shall decide whether the premium shall be awarded as recommended hy the Judges.

Every memoir shall be anonymous, but shall contain some sign hy which it can he recognized and designated, and shall be accompanied by a sealed envelope, endorsed on outside with same sign, and containing the name nnd address of the author of the memoir. The memoirs presented for the premium shall become the property of the Franklin Institnte, and shall be published as it may direct.

Effects of Heat on Granites.—Mr. Hiram A. Cutting, State Geologist, of Vermont, has been testing the capacity of different sorts of granite to withstand heat. He tested 22 specimens of the best known quarries, and found thnt while all were unaffected hy 500° Fah., damage usually began at 600°, was serious and frequent at 800°, and at 1,000° all the specimens were ruined, the stone from Mount Desert standing the test perhaps hetter than any other. He gives it as his opinion that the effect of water on heated granite is rather apparent than real.

Where Does Coal Oil Come From?

This is one of the qnestions that has long agitated the scientific world, and npon the answer to it more depends than seems to at first sight. If we know its source we can fairly determins as to the naturs and extent of ths supplies, and as to where to look for them. Ths *Scientific American* says: Some have thought that the oils have been produced by a slow distillation dnring the process of coal formation. A fatal objection, however, to this theory is found in ths fact that Great Britain, which has immense coal beds, contains nothing of ths kind, though suppesed traces have been found here and there.

The silurian and devonian rocks, which contnin the sources of most of the oil wells now in existence, have great quantities of fossil remains, and this has suggested the theory that the oils have resulted from their decomposition.

Prof. Mendeljeff thinks that on the first formatinn of the earth vast reservoirs of inorganic iron and carbon existed in the interior of the glohe. These were reached by the water condensing on the newly formed land and percolating beneath its surface. The heat decomposed the water into its component parts, oxygen and hydrogen, the first forming with the iron oxide of iron, the latter with the carbon petrolenm and other hydro-carbons. If this theory he the correct one, there still exist in the center of the earth reservoirs of petroleum that are to the sources as yet known as the ocean is to the spring, whose waters finally find a resting place in its hosom.

Dr. T. Sterry Hunt, of Massachnsetts, propounded in 1861 a theory to which he still adheres. He thinks that many of the animated beings of early ages were half vegetahle, half animal, and that the decomposition of their tissues produced what is known as mineral oil. Certain magnetic oliferous limestones have been found to contain 4½% of their bulk of petrolenm. A square mile of these 35 ft. thick would yield nearly 8,000,000 harrels, and as the area of these rocks is very great, they may contain supplies calculated to last an indefinite period of time. The subject is one well worthy the attention of all interested in oil wells.

Compression of Gaseous Mixtures.—If five volumes of carbonic acid and one volume of air are compressed in a proper apparatus the carbonic acid readily liquefies. If the pressure is carried to 150 or 200 atmospheres the meniscns of liqnefied acid is gradually effaced, and the liquid finally disappears. The tube then appears filled with a homogeneous matter, which resists all frther compression, as a liquid would do. If the pressure is then gradually diminished the liquid suddenly reappears, at a pressure which is constant for fixed temperatures; a thick mist arises, vanishes in a moment, and marks the level of the liqnid which has reappeared. The phenomenon cannot he explained by the heat of compression, for the tuhe is plunged in water which keeps it at a constant temperature, and the compression is made slowly enough for the cooling to be always complete. Cailletet thinks that the gas and liquid are mutually dissolved, so as to form a homogeneous compound. He has extended the experiments to a pressure of 450 atmospheres without varying the result.—*Compt. Rend.*

A New Phenomenon of Magnetism.—It is well known that the ratio hetween the residual and the temporary magnetism of a har of steel enveloped hy a magnetizing coil diminishes as the har hecomes shorter and thicker. Ang. Kighi was led hy theoretical considerations to a conclusion which is opposed to the ordinar phenomena, hut which experience has confirmed in every particular. It is this: If we take bars of the same steel and of the same diameter, but of diminishing lengths, we finally reach a length which shows no magnetization, and with still smaller lengths we obtain a residual magnetism which is opposite to that of the coil.—*Comptes Rendus.*

Spontaneous Generation. — Bastian has again visited Paris in order to try to demonstrate his views with regard to spontaneous generation. Being unahle to come to any agreement with Pasteur as to the manner of conducting his experiments, he decided to return to London. But hefore setting out he described his operation in detail, and Pasteur asked him how he cleansed his retorts. He replied "by rinsing them with very pure water." Pasteur assured him that there were hacteria even in the purest water, and advised him to repeat his experiments after having heated all the apparatus thoroughly in the fire. Nothing has since heen heard of spontaneous generation—*Les Mondes.*

The New Metals—M. Delafontaine has been examining the supposed new metals, and in the *Comptes Rendus* of the Academie des Sciences, he expresses his helief that the earths ytterhia, decipia, and philippia are real additions to scienc; and he then states that he cannot receive the other alleged new elements, which depend upon ohservations of "ahsorption spectra," as genuine.

Science Award.—The French Academy of Sciences has awarded *an extraordinary prize* of 3,000 francs to Dr. William Crookes, in recognition of his distinguished services to science hy his stndies in molecular physics, and his contribution to our knowledge of the propertiea of radiant matter.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 27.		Week Ending June 3.		Week Ending June 4.		Week Ending June 17	
Alpha	6	5¼	6¼	5¾	6	4¾	6	5¾
Alta	2.60	2¼	2.70	2.40	2¼	2	2.40	2.05
Andes	95o	75c	95c	75c	80o	75c	80c	65o
Alps	....	....	....	....	....	....	....	....
Argenta	20c	....	45o	20c	50c	45c	55c	40o
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	50c	30c	55c	35c
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	3.16	2.60	3.15	2.70	2¾	2	2.30	2.10
Belmont	40c	....	25c	....	15c	....	....	....
Best & Belcher	11¾	....	11	10	9¾	8¾	....	2¼
Bullion	3¼	2.80	3	2¼	2¾	2	2¼	2
Bechtel	1½	1.30	1¾	1¼	1½	1¼	1¾	1.10
Belle Isle	500	45c	50c	....	45c	....	60c	40c
Bodie	8.60	7¾	8¼	8	8	7¾	7¾	6¾
Benton	1.70	1¼	1.60	1.45	1.30	1	1.30	1.05
Bulwer	6	5¾	6	5¾	5¾	5	5	4.90
Boyle	....	....	....	....	....	....	....	....
Black Hawk	65c	....	65c	60c	80c	75c	90c	80c
Belvidere	2¼	2.40	2¾	2¼	3¼	2¼	2.80	2.60
Booker	40c	35c	40c	35c	60c	30c	75c	60c
Caledonia	60o	40c	40c	25c	80c	60c	70c	60c
California	2.30	2.05	2.20	2	2.15	2	2.20	2
Challenge	1.55	1¾	1¾	....	1.45	....	1.05	1
Chollar	3.80	3¼	4	3.30	3¾	3.15	3.40	3.10
Confidence	6	5¼	5¾	5¼	5¾	5	....	....
Con Imperial	45c	30c	85o	30c	40c	35c	40c	35c
Con Virginia	3.15	3	3.45	3	3.35	3.10	3.45	3.15
Crown Point	1.90	1¾	1.95	1¾	1.90	1.35	2	1¾
Con Washoe	....	....	....	....	....	....	....	....
Champion	75c	60c	70c	60c	1¼	66c	1.20	85c
Concordia	80c	75c	60c	45c	85c	60c	90o	75c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Dacey	....	....	....	....	....	....	....	....
Day	85c	70c	80c	60c	75c	65c	60c	....
Eureka Con	18	17¾	18¾	17¾	19¼	18¾	19¼	18¾
Exchequer	2¼	2	2¼	2.10	2.10	1¾	2	1.90
Endowment	....	....	....	....	....	....	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1.10	70c	1	90c	1.10	95c	1.05	1
Gila	....	....	....	....	....	....	....	....
Golden Charlot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	....	....	....	....
Goodshaw	75o	65c	1.05	75c	3¼	1.45	3.45	1.95
Gould & Curry	4.35	3.35	4.30	3.85	3.90	3¼	3.70	3.05
Hale & Norcross	4.60	3.60	4.20	3¼	3.60	3	4.55	3.35
Hillside	....	....	50c	....	75o	45c	75c	....
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	50c	40c	40o	....	....	....	45c	40c
Julia	70c	55c	65c	25c	35o	30c	75c	30c
Justice	1.15	75c	85o	75c	75o	35c	50c	40c
Jackson	2¼	....	....	....	2	....	2¼	....
Joe Scates	....	....	....	....	....	....	....	....
K E Con	....	....	4¼	....	4¼	....	....	....
Kentuck	2	....	2	....	2	....	2	1¾
Kossuth	....	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	10c	....
Lady Wash	40c	....	35c	....	35c	30c	30o	25c
Leopard	....	....	....	....	....	....	....	....
Leviathan	25c	20c	....	....	25o	10c	....	....
Leeds	....	....	....	....	....	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	30o	20c	60c	30c
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	35c	....	....	....	....	....
Martin White	....	....	60c	50c	75c	65c	75c	....
McClinton	50c	40c	65o	40c	65c	50c	45c	35c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	8¾	7	10¼	7¼	9¾	8¼	8¾	8¼
Midas	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	60o	50c	45c	25c	30c	15c	25c	20c
Northern Belle	11¼	10¾	11¾	10¼	12⅜	12	12	11¾
New Coso	....	....	....	....	....	....	....	....
Navajo	20o	....	20c	....	....	....	25c	20c
Occidental	1¾	1.30	1¾	1.35	1.40	1	1	90c
Ophir	10¼	8¾	9¾	8⅝	8¼	6¾	7¾	6¾
Oriental	....	....	....	....	....	....	....	....
Overman	2¼	1.60	2.10	1.85	1.85	1.70	1¾	1.10
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	....	....	....	....	....	....	....	....
Potosi	3	2¾	3	2.70	2.80	2¾	2.60	2.35
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	25c	....	25c	....	25o	20c	20c	....
Richer	....	....	....	....	20c	....	10c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	4.05	3.30	3.55	3.16	3.20	2¾	3.20	2.70
Seg Belcher	8	....	8¼	8	....	....	8¾	8
Sierra Nevada	15¾	12¾	13¾	13	15¾	13	13¾	13¼
Silver Hill	80o	60c	76c	65c	70o	55c	60c	55c
Silver King	5	4¼	5¼	....	5	4¾	5	4¼
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	1.80	1¼	1.85	1.60	2	1¼	2.10	1.90
Scorpion	1.65	1.10	2	1.60	1.65	1¼	1.70	1¾
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	30c	25c	....	....	30c	....	....	....
South Standard	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	1¾	1	1	95c	1.05	90c	2	....
Tioga Con	1¾	....	1.60	1	2	1¾	1¾	1.60
Tiptop	6¼	5¾	6¾	5¾	7	5¾	6¾	....
Trojan	....	....	....	....	....	....	....	....
Union Con	19	16¾	22¼	18	20¾	18¾	19¾	18¾
Utah	10	8¼	12¾	8¾	11	9¾	10	9
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.70	1¼	....	....	1.60	1¼	1.40	1.30
Wells-Fargo	....	....	....	....	....	....	....	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	6¾	5¾	8	5¾	6¾	5¾	6	5¾

Sales at S. F. Stock Exchange.

Thursday A.M., June 17.

60 Alpha 6
110 Alta 2.40
150 Andes 80c
135 B & Belcher ..... 3.00@3.05
530 Belcher ..... 2.30@2.35
40 Bullion 2.05
285 California ..... 2.05@2.20
560 Chollar ..... 3.05@3.40
185 Con Virginia ..... 3.45@3.40
295 Crown Point ..... 1.85@2
1750 Con Imperial 35c
50 Caledonia 60c
50 Challenge 1.05
350 Con Dorado 45c
130 Exchequer ..... 1.95@1.90
70 Gould & Curry 3.70
620 Hale & Nor ..... 4.45@4.55
320 Justice 40c
300 Julia ..... 75@70c
150 Lady Wash 30c
200 L Bryan 40c
125 Mexican ..... 8⅝@8¾
150 Mountain View 1.55
150 Mackey 10c
430 Ophir ..... 7¾@7
270 Overman ..... 1.20@1¾
80 Occidental 1
760 Potosi ..... 2¼@2.60
275 Quinn ..... 2.05@2
1370 Savage ..... 3@3.20
10 Scorpion 1.60
10 Seg Belcher 8
100 Silver Hill 55c
135 Sierra Nevada ..... 13¾@13
100 Union ..... 19¼@19¾
295 Utah ..... 9¼@10
50 Ward 1.40
565 Yellow Jacket ..... 5¾@6

AFTERNOON SESSION.

550 Addenda 1¾
120 Argenta 50c
675 Alhion ..... 45@50c
100 Aurora 40c
30 Bulwer 4¼
245 Bechtel ..... 1.10@1
100 Belmont 10c
275 Black Hawk ..... 75@80c
100 Booker 55c
100 Boston 1.20
130 Belvidere 2¾
200 Champion ..... 85@1
200 Concordia 75o
170 Caledonia (B Hi) 4¾
350 Dudley ..... 60@65c
90 D Standard ..... 70@65c
100 Day 60o
100 E Mt. Diablo 80o
20 Eureka Con 19¼
630 Goodshaw ..... 2¼@2.35
70 Hillside 75c
150 Jupiter ..... 2.05@2
50 Mt Diablo 15
200 Mt Potosi 75c
325 Mono ..... 5¼@5½
50 May Belle 50c
70 Mammoth 2¾
40 Noonday ..... 4.20@4
800 Navajo 25c
100 Northern Belle 11¾
100 Paradise 35c
110 Raymond & Ely ..... 20@15c
100 Syndicate 1.10
200 S Bulwer 1.10
450 Summit ..... 2@1.95
400 S Noonday ..... 1.20@1.15
100 Tiptop 6¾
40 Tioga Con 1.55
1350 University 40c
100 Wales 3½

THE Liherian government intends to employ elephants to facilitate trade with the interior of western Africa.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	12	1 00	May 12	June 16	July 7	W Willis	309 Montgomery st
Argenta M Co	Nevada	5	25	Apr 28	June 2	June 22	E M Hall	327 Pine st
Atlanta M Co	Utah	1	05	Jan 2	June 24	July 19	A F McGrew	420 Montgomery st
Atlas M Co	Utah	1	20	May 19	June 23	July 14	A F McGrew	420 Montgomery st
Bechtel Con M Co	California	5	25	June 12	July 20	Aug 9	W H Lent	309 Montgomery st
Booker Con M Co	California	5	20	May 10	June 15	July 7	W H Lent	309 Montgomery st
Bullion M Co	Nevada	15	1 00	June 2	July 7	July 27	J M Brazell	328 Montgomery st
Caledonia M Co	Nevada	31	50	May 4	June 8	June 28	R Wegener	414 California st
Con Imperial M Co	Nevada	11	10	May 5	June 8	June 28	W E Dean	203 Bush st
Crown Point M Co	Nevada	41	50	May 8	June 11	July 2	J Newlands	203 Bush st
Dudley M Co	California	8	25	Apr 20	May 24	June 22	E C Masten	309 Montgomery st
Hale & Norcross	Nevada	64	50	May 11	June 16	July 8	J F Lightener	309 Montgomery st
Julia Con M Co	Nevada	12	40	May 12	June 16	July 6	H A Charles	419 California st
Jupiter M Co	California	9	40	June 14	July 16	Aug 11	E O Masten	18 Nevada Block
Justice M Co	Nevada	32	50	May 22	June 26	July 19	R E Kelly	419 California st
Mexican G & S M Co	Nevada	11	1 00	Apr 28	June 1	June 21	O L McCoy	203 Bush st
Mackey G & S M Co	Nevada	3	10	Apr 25	June 1	June 21	J M Buffington	309 California st
Mammoth M Co	California	5	50	June 16	July 27	Aug 27	A W Rose, Jr.,	302 Montgomery st
Ophir S M Co	Nevada	36	1 00	June 4	July 9	July 29	C L McCoy	309 Montgomery st
Overman S M Co	Nevada	46	50	June 10	July 16	Aug 6	Geo D Edwards	414 California st
Red Cloud Con M Co	California	7	20	May 11	June 17	July 9	W J Taylor	310 Pine st
Sierra Nevada	Nevada	63	1 00	April 30	June 4	June 21	D L Parker	309 Montgomery st
Scorpion M Co	Nevada	7	40	Apr 26	June 7	June 30	Geo R Spinney	310 Pine st
South Standard M Co	California	6	20	April 29	June 3	June 23	C A Sankey	331 Montgomery st
Utah S M Co	Nevada	30	2 00	Apr 28	June 2	June 22	G C Pratt	309 Montgomery st
University G M Co	California	6	12½	June 10	July 14	Aug 3	Wm L Oliver	328 Montgomery st
Yellow Jacket M Co	Nevada	37	1 00	May 5	June 5	July 7	M Otey	203 Bush st
Wells Fargo M Co	Nevada	14	10	May 26	June 28	July 19	A Colburn	318 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Argonaut M Co	Arizona	1	03	May 26	July 3	July 24	J Pentecost	702 Market st
Black Rock M Co	California	3	15	Apr 2	May 21	June 21	N T Root	225 Beale st
Concordia M Co	California	3	15	June 1	July 8	Aug 2	Wm J Taylor	310 Pine st
Cumberland G & S M Co	Arizona	1	30	June 3	July 19	Aug 9	Jno H Griffiths	328 Montgomery st
Defiance G M Co	California	5	25	May 20	June 28	July 21	W H Lent	309 Montgomery st
East Mt Diablo M Co	Nevada	1	10	May 7	June 14	July 6	G W Fisher	324 Pine st
Empire G & S M Co	California	2	10	June 4	July 7	July 26	Jno McGeoghegan	318 Pine st
Excelsior Deep Gravel M Co	California	10	10	Apr 21	May 24	June 15	D F Verdenal	327 Pine st
Fairfax M Co	Nevada	2	20	Apr 7	May 26	June 16	O C Miller	324 Pine st
Gover M & M Co	California	42	20	May 5	June 21	July 14	W O Wilson	402 Front st
Morgan M Co	California	6	50	May 14	June 21	July 15	J J Raphael	533 Kearny st
Monte Cristo Con M Co	California	3	10	May 26	July 5	Aug 5	Butler Burris	309 Montgomery st
Mt Potosi Con M Co	Nevada	3	2 50	May 11	June 14	July 6	E A Holmes	318 Pine st
Metallic M Co	Nevada	3	25	June 9	July 13	Aug 3	Wm Willis	309 Montgomery st
Murchie G & S Co	California	3	25	Apr 20	May 21	June 21	S D Rodgers	328 Montgomery st
Northern King M & M Co	Arizona	4	20	May 14	June 19	July 12	E A Holmes	310 Pine st
Original Keystone S M Co	Nevada	3	50	May 26	June 29	July 21	F E Luty	330 Pine st
Occidental Con G M Co	California	4	03	June 14	Aug 5	Aug 25	W T Smith	402 Montgomery st
Oro Blanco M Co	Arizona	1	20	May 3	June 7	June 28	W O Goidd	220 Sansome st
Paris M Co	California	1	10	June 1	July 7	July 30	Wm J Taylor	310 Pine st
Red Hill H M & W Co	California	3	03	June 15	July 17	Aug 2	A B Paul	328 Montgomery st
Rocky Point M Co	California	3	05	May 23	June 28	July 19	T U Hibbins	314 Bush st
Swamp Angel G M Co	California	1	12	June 2	July 24	Aug 12	Chas W Badger	315 California st
Telfair M Co	Arizona	3	01	June 8	July 17	Aug 7	J Pentecost	702 Market st
Vanderbilt M & M Co	Nevada	1	15	Apr 12	May 20	June 16	J Morizio	328 Montgomery st
Wide Awake D & M Co	Arizona	10	05	May 22	July 1	July 20	C Hildebrandt	232 Sutter st
Wyoming Coal M Co	Wyoming	2	3	April 21	June 10	July 10		
Wyoming & Dakota W Co	Dakota	2	1 00	May 6	June 16	June 30	T Widman	404 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alpha Con M Co	Nevada	Wm Willis	309 Montgomery st	Annual	June 21
Eagle S M Co	Novada	J E Byrne	533 Kearny st	Annual	July 5
North Belle Isle	Nevada	E M Hall	327 Pine st	Annual	June 23
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 19
Vanderhilt M & M Co		J Morizio	328 Montgomery st	Annual	June 19

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Q M Co	California	W L Oliver	Safe Deposit Bldg	25	May 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	60	June 19
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	50	Apr 24
Idaho G M Co	California	O Meade	324 Pine st	2 00	Apr 9
Napa Quicksilver Con M Oo	California	Wm W Parrish	330 Pine st	10	June 10
Natoma Water & M Co	California			2 00	Apr 5
Northern Belle M Co	Nevada	W Willis	309 Montgomery st	60	May 15
Ontario M Co	Utah			50	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12
Seventy-six S M Co	Nevada	E F Stouo	306 Pine st	03	May 24

The Mining Share Market.

There has been little, if any, difference in the operations of the mining share market since our last publication. The activity in the Bodies continued for several days, but under the large sales prices were not maintained, and they gradually took a downward tendency, and at the close were weak and dnll. So far as the Comstocks are concerned, the market is quiet, hut firm; holders are evidently hopeful of the future. They are seemingly undisturbed by the antics of either hnll or hear.

There has been nothing of especial interest reported from the Comstock mines. There, as well as elsewhere, the attention of holders is turned towards the north end as the point whence good news will come first. The opening of the 2500 level of the Union is looked to with increasing interest.

Good reports continue to reach us from Bodie and Columhus districts. In the latter the developments in several mines—as the Northern Belle and Jackson—have drawn unusual attention, and led to considerahle activity in the mining shares.

Bullion Shipments.*

Since our last issue, we have noticed the following hullion shipments:

Paradise Valley, Jnne 7, $2,762.34; June 11, $4,517.79; California, June 11, $49,657; Northern Belle, June 9, $6,594.46; Contention, June 8, $8,013; Tombstone, June 8, $11,950.97; Star, Jnne 11, $1,764.63; Northern Belle, June 12, $10,605.60; to the Carson Mint, June 14, Paradise Valley, $1,500; Ontario, per Wells, Fargo & Co., Salt Lake City, June 11, $4,315.49; Barhee & Walker, per Wells, Fargo & Co., Salt Lake City, Jnne 11, $1,828.73; Richmond, June 12, $22,458.54; Grand Prize, for May, $23,388.93; Silver Reef, for May, $113,013.39; Alexander, for May, $26,414; Northern Belle, for May, $100,450.

*Desiring to make our list of Bullion Shipments as complete as possible, we will he thankful to receive from mining Superintendents and Secretaries notice of all hullion shipments from their respective mines.

THE Fresno *Expositor* tells of an important development in the Cartwright mine on King's creek, east of Fresno. A true fissure vein, carrying a four-foot ledge of rich ore, has been found,

The California State Mining Bureau.

On the 1st inst., Mr. Henry G. Hanks, the newly appointed State Mineralogist under the Wasson bill, passed at the last session of the Legislature, assumed charge of the California State Mining Bureau. This is a new department, organized under the act referred to, and is one which will he of practical service to the miners and metallurgists of the State. We have received from Mr. Hanks a circular giving a copy of the bill under which the Bureau was organized, hnt we have already published it in full. The circular states that the Bureau commences with a large and valuahle donation of ores, rocks, fossils, reports, books, etc., comprising the collections of the State Geological Society. A State museum of practical geology will be made a special feature of the Bureau, to which all contrihutions will he duly accredited, displayed and preserved. There will he a library of reference maintained hy the Bureau, in which works on mineralogy, geology, mining, metallurgy and kindred subjects will he collected, together with maps, reports, copies of district laws, etc. To the museum and reading room the puhlic will have access during seasonable hours.

There will be new and interesting matters constantly added, such as maps, reports, snrveys, etc., hesides a collection of all the ores, rocks, fossils, metallurgical products, huildstones, etc., of the Pacific coast, with models of machinery in use and newly invented, and a general collection of minerals and ores of other countries for reference. It is intended to include all that pertains to practical and legitimate mining.

Every article sent to the Bureau will become the property of the State, for the use of and henefit of the public, and will be carefully preserved. As it is desirahle to make the museum as instructive and attractive as possihle, the co-operation of the puhlic at large is wanted by the State Mineralogist. Packages may he addressed to the California State Mining Bureau, San Francisco, and sent hy Wells, Fargo & Co.'s Express, or hy railroad, or steamship lines, as slow freight.

THE Crater mine at Ophir, Placer county, has taken out over $53,000 in four months, and it is now said to be doing even hetter still. There are hetween 30 and 40 men employed there.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MAHONEY MINE.—*Ledger*, June 12: We are pleased to he ahle to state that the Mahoney Co. are going to start work forthwith. A 40-stamp mill is to he put up as speedily as possihle—within 90 days if practicable.

YELLOW JACKET.—A clean-up was made of a short run, and the yield amounted to $9 per ton—a gratifying result. Regular hoisting works are now in process of erection, the machinery of the Bonanza being moved to the Yellow Jacket. The shaft is being widened. Altogether there is a prospect for a good paying mine.

BROWN CO.—We are informed that work is to he commenced shortly on the Brown Co. claim, which is the extension of the Good Hope, Jackson.

ITEMS.—The big Volcano tunnel advanced 70 ft during May. The Amador Con. is looking better. The ledge grows wider and the rock increases in richness. The Iowa, helonging to A. Thihetts & Sons, is also improving, and the outlook for the future is all that could he wished for. They are paying off regularly every month.

IONE CITY.—*Dispatch*, Jnne 12: Mining is going on with renewed activity in the vicinity of the Kirkendall mine, and also at the copper mine.

CON. AMADOR.—Suttor Creek Cor. *Sentinel*, Juoe 8: The new shaft of the Con. Amador is progressing finely, the rock is improving in richness as depth is attained. The ledge is remarkably wide and enough rock is in sight to keep the mill crushing to its full capacity for years to come.

AMADOR KING.—We have reliahle information that the owners of the Amador King are in negotiation with San Francisco capitalists, and that satisfactory arrangements for the development of the mine will probably he made in a few days.

DIVIDEND-PAYING MINES.—*Ledger*, June 12: The dividend-paying mines of Amador are the Amador Con., of Sutter Creek, and the Empire, of Plymouth. The first named has never levied an assesement. It has paid 34 dividends, amounting to $317,500. The Empire has paid 17 dividends, amounting to $478,000.

BUTTE.

HENDRICKS MINE.—*Mercury*, June 11: At the Heudricks mine, in Morris ravine, rich pay dirt has been struck and work is being pushed ahead as fast as muscle and water can push it. The men are now at work near the south end of South Table mountain, near where George Rigshy formerly operatod. The gravel presents the same appearance of that at Cherokee, and is of the same richness.

POWERS MINE.—Across the river O. P. Powers is piping away at the bank day and night. His last clean-up yielded him about one-third more than he expected. This mine has been paying so evenly for years past that it was easy to guess the value of the gold taken out each run. But a far richer streak or stratum was struck about a month ago, and the result is that it is one of the best pieces of property in the county.

MINING NOTES.—The mining interests of the county look brighter than ever hefore. Immense heds of gravel are only waiting for water to wash out the gold that is in them. And now a ditch capahle of carrying 3,000 inches of water is fast heing huilt, and thus the great want will he supplied in a great degree. Almost every day men with money—new men—arrive in town to look at the different pieces of mining property. The mines at Cherokee are paying hetter than for years past. How much of the kind of ground they are now in is uncertain, hut the company claim a large amount. Since the Davis ditch has become a reality, every foot of ground on Thompson's flat has become very valuahle and is located, some of it three claims deep.

A LITTLE BONANZA.—A friend stepped into our sanctum yesterday morning and ehowed us $1,200 worth of gold which he had taken out of a little quartz ledge in Mountain Spring township. The rock yields $8 per ton, and it only costs $1.50 per ton to work it. He does all the work himself and says he intends to stick to it. There are a vast number of just such ledges in the surrounding hills that should he taken up and worked.

SPRING VALLEY MINE.—*Record*, June 12: Supt. Waldever is anxious to continue his present run until July 1st hefore stopping to clean up. He is pushing ahead with energy in splendid gravel, and confidently expects to make a hetter showing than the mine has ever made.

CALAVERAS.

BOSTON MINE.—*Chronicle:* Developments at this mine, Buckeye gulch, continue wholly favorahle. In fact, the richness and extent of the vein are almost incredihle. The ledge is from 60 to 80 ft in width and contains strata of ore that will mill $100 per ton. In many instances the rock is absolutely hold together with threads and strings of gold. There are thousand of tons of ore in sight that glistens with free gold. Preparations for the erection of a 20-stamp mill are going briskly forward, and will he urged to a rapid completion as soon as the necessary lumher can he had. A fine hoarding house and lodging house have been huilt, and work is progressing energetically upon the mine.

EL DORADO.

GROSS MINE.—*Democrat*, Juuo 12: Everything in connection with this property, including recent clean-ups, is so satisfactory to the proprietors that they now propose, we understand, to add 40 stamps to the present battery, making 70 in all. As this conclusion must have heen arrived at after a thorough investigation of the deposit in sight, it is fair to presume that the original reports of its magnitude have not heen exaggerated.

INYO.

PIUTE DISTRICT.—*Independent*, June 12: The property hest know as the Johnson mine and mill, opposite Bishop creek, has heen worked some 2 or 3 months under the management of D. H. Sullivan, lessee. The mines consist of gold ledges known as the Golden Era, Tender, Buena Vista and Luella Nos. 1 and 2, and helong to Messrs. Sneden, Spencer and Bennett. Mr. Sullivan has heen running the 5-stamp mill and arastras, for a short time, under great difficulties and lack of steam for heating, hut has already shipped gold amounting to about $500. As the snow is clearing away he is putting on a larger force and following up his work with increased capital and experience.

MARIPOSA.

COE MINE.—Coulterville Cor. Mariposa *Gazette*, June 7: This mine is producing large quantities of gold. They have at present a 6 ft vein in the shaft that will pay from $40 to $50 to the ton. The shaft is down at present 45 ft helow the main tunnel. They can almost keep their 8-stamp mill constantly running from the rock taken from the shaft. They have just made a clean-up of $5,000 on a 10-day run of 8 stamps.

MINING NOTES.—The Martin & Walling will have water out of the mine and get to drifting this week. The Bandcrita is making 3 ft a day in its main tunnel. It is at present in about 90 ft. The Crown Lead mine will start up this week, beginning with a small force of men. The Cook Bros. were up 2 weeks ago looking at their large mining interest in this section. They are at present running a tunnel on the Potosi and sinking a shaft on the Malvena ledge.

MINES OF HORNITOS.—The recent sale of the No. 9 mine for a respectable amount has given an incentive to many claimants of mines to go to work and try the process of development hy actual work instead of the too much jawbone process.

ENTERPRISE MINE.—We hear favorahle reports from this mine, upon which a mill is contemplated and is probahly in the course of construction. This mine helongs to an

incorporated company. Since the big strike of late the stock, which could have been bought for 50 cents a share, is now held at $50 and $100.

Pool M. Co.—This company is reported to be doing well under the new Americanized arastra process. They have good pay rock. The only trouble heretofore was to save the gold, which is now claimed to be a success under the new process.

MONO.

Strike of Rich Gold Ore.—Mammoth City *Herald*, June 12: Yesterday morning a party of gentlemen went up to the south end of Mineral hill to look at a new and important discovery lately made by J. C. Brown and Peter Simmes in the Lisbon mine. A shaft has been sunk to a depth of about 30 ft, showing a ledge of 3 ft in width, in which free gold is plainly visible to the naked eye and very evenly distributed throughout the rock. The surface rock is similar to that found in other locations in the southern portion of this district.

Mammoth.—Tunnel No. 4 has been driven forward a distance of 35 ft in the header, giving a total length of 1,441 ft. In crosscut No. 2 a distance of 20 ft has been made, and they have not yet cut through the vein. Work was commenced in tunnel No. 3 during the fore part of the week, and the tunnel advanced 10 ft, making a total length of 930 ft. Work preparatory to breasting out ore has been commenced on this level at a point about 20 ft south of the Hardy winze. The ore body at this point is looking exceedingly well and gives good assays. Ore from this portion of the mine will be sent to the mill in 2 or 3 days.

H. L. & M. C. Joint Tunnel.—In consequence of the excessively hard character of the rock and the breaking of both drills, retarding the work for 1 day each, but 15 ft of headway has been made since our report of last Saturday. The total length of the tunnel is now 787 ft.

New Mill.—The Wales & Burke Con. mill has for the last 2 days been in successful operation. Although of but 4 stamps capacity, its crushings have exceeded the most sanguine expectations of the inventor. It is run by water power.

Laurel District.—The Fresno company is busy at work building houses and getting ready for their summer's work on the Convict, Queen and other mines of which they are owners. Work will be immediately commenced on the IXL mine in earnest. We are informed that a shaft will be sunk on the ledge to the depth of 60 ft, when a crosscut will be run to determine the strength of the rich body of ore already discovered on the surface. Other parties owning mines in the district, it is expected, will soon commence work.

Goodshaw.—*Free Press*, June 12: Another vein was cut yesterday in the east crosscut, 600 level, which last evening had been penetrated 2 ft, it resembled in appearance the Addenda and Oro ledges, being essentially silver-bearing rock. The Supt. will at once commence the erection of an ore house at the Goodshaw mine, and will commence to run drifts north and south on the rich ledge.

Standard Con.—Bodie *News*, June 12: The north drift from the east crosscut, 700 level, has been advanced since last report 10 ft, making a total of 105 ft. The north drift, 500 level, is in 20 ft. The south drift is in 28 ft, with no change to note in the appearance of the vein, which is about 6 ft wide. The north drift, 500 level (incline), has been extended during the past week 10 ft; total length, 100 ft. The vein at this point is 5 ft wide. The upraise on West Standard ledge is up 115 ft, showing a ledge 4 ft wide. During the week there has been no change in the appearance of the stopes.

University.—The east crosscut on the 510 level is now in 80 ft from the shaft, the face in iron-stained vein porphyry. Some very fine-looking seams of ore and clay are being cut, and the prospects are most favorable for soon cutting the ledge. In the west drift the ledge shows great improvement as advance is made south. The ledge continues to show a nearly solid body of fine milling ore, part of it being of a very high grade. This work will be continued to the company's lines, when ore stopes will be opened and the work of extracting ore for milling purposes commenced. The shaft is in fine condition for running cages, and the machinery at the surface is all in perfect working order.

NEVADA.

Planet Gravel Mine.—Grass Valley *Union*, June 10: The tunnel of this mine is in a distance of 2,400 ft, and has nearly reached the center of the channel, as is evidenced by the presence of coarse gold. The bottom of the channel is from 50 to 60 ft lower than the original grade of the tunnel, and has been reached by means of an incline and the aid of steam engine to do the pumping and run the cars. Now, that the depth of the channel has been ascertained, the tunnel is to be extended on its original regular grade, through the gravel, a distance of about 400 ft, to which point the engine will be removed, and a slope put down to the bottom of the channel

Items.—The Nevada City *Herald* learns that the Providence mining company will shortly erect an 80 stamp mill. A carload of machinery, belonging to the Cisco Con. mining company, passed through Truckee from New York, the other day, for the mine, which is located 2½ miles from Cisco.

Bessie Miller.—*Foothill Tidings*, June 12: This mine, near Washington, in this county, has been released from attachment and the property restored to Mrs. Miller, of this place. It is understood that Mrs. Miller has parties ready to put in money to fully develop the mine.

New Mining Ditch.—*Transcript*, June 10: A survey is being made for a ditch to extend from a point on Deer creek, near Scott's flat, to the reservoir of the Manzanita mine in Willow valley, a distance of about 6 miles. The construction of this ditch has been contemplated for some time, and it will, we understand, largely increase the value of the Manzanita claim by giving it an additional supply of free water.

PLUMAS.

The Emigrant Lead.—Plumas *National*, June 5: Smith & Davis, of Butterfly, have recently got a shaft to bedrock in their gravel deposit, and have discovered that they have a rich, coarse gold lead, and, they think, a continuation of the old Emigrant Hill lead. We were shown the gold which came from the bedrock in the bottom of the shaft, amounting to $10 or $12, and heavy, coarse channel gold. The depth of the shaft is 25 ft, and the ground is good from the top down. We are glad to record just such strikes, as it adds another item to the strong proof of the wealth of the section in which they are operating.

Argentine Quartz.—We were shown, the other evening, a chunk of retorted gold from the claim of the Thompson Bros., at Argentine. The piece was worth between $400 and $500, and was the result of a 10 days' run of their 5-stamp mill. They are said to have a large quantity of rock of the same quality, and although it is low grade they can mine it, and mill it in their water mill at a good profit. With larger milling facilities they would make a big business. The gold is very fine, and would sell to the merchants at $18 per ounce.

Notes.—The quartz mine discovered on Little Bear creek, last summer, promises to be valuable. The owners are running a couple of arastras, and making them pay liberally. The quartz is white, and the gold mostly in the seams, but it is plentiful when you do find it. Considerable prospecting is going on in Plumas now.

Spanish Peak.—*National*, June 12: Report comes to us that a splendid strike of blue gravel was made in the Spanish Peak tunnel, now being run by the Chicago company, one day this week. The gravel looks well, and, what is better, prospects at the rate of 5 cents to the pan. The managers are highly pleased, as they have every indication of a monster blue gravel mine, and if their anticipations are realized, their Chicago stockholders will be receiving dividends before the season is over. They are working a force of about 20 men and are pushing the work along rapidly.

Items.—Greves & Co. have struck a streak of blue gravel in their Blackhawk claims, and are in high spirits over it. Mr. Oeo. Cornell now has charge of the Indian Valley mine, and has put on a force of men. The probabilities are strong that a few months will show the mine to be one of the best in the Greenville section.

SAN BERNARDINO.

Cottonwood District.—Colton *Semi-Tropic*, June 12: From a party of prospectors just returned from the mining region north of us, we learn that the Alabama mine, which they located, yields ore which assays from $20 to $1,100 in gold and silver per ton.

Hunkey Mine.—They also bring ore samples from the Hunkey lead, in Mineral hill, which is situated about 600 ft above the Alabama, and running in the same general direction. This lead is 7 ft wide, with immense chimneys jutting out all along its course. The rock assays from $40 to $90 per ton, with 50% more silver than gold.

Rich Gold Ore.—The party brought from Gold hill, 00 miles from Colton, on the road to Panamint, specimens which are full of free gold. The finest specimen, however, is from the Blue Jacket lead, 5 miles from Rogers station on the Mohave river. This ore assays from $125 to $4,000 per ton. All of these samples are free milling ores, and the party predicts that this Mineral hill is to become one of the greatest mining localities in California, especially because of having the advantage of the heavily wooded river flowing at the base of the mountain.

TUOLUMNE.

Starr King.—*Independent*, June 12: Work in this mine is being energetically pushed forward. The company have a 5-stamp mill which they keep working on ore from the vein, which, though small, is immensely rich. A ton of ore is not as easily mined out of this vein as out of the generality of quartz ledges; but when they do get the returns of a few tons' crushing, it swells their purses amazingly. This mine is one and a half miles below the New Albany, and on the same side of the river, and is worked by steam power.

Spring Gulch.—This mine is situated in Spring gulch, and three miles from the New Albany mine. The mill is a good substantial structure on the improved order, having in place 10 stamps. The ore is transported from mine to mill in Hunter's canyon, a distance of 1½ miles on iron cars. The object in building the mill so far from the mine was to get water power, which is on the high pressure principle. The water wheel is placed 250 ft or more below the mill and the power transmitted by wire cable Steam power is used in hoisting out of the mine. The works in the mine have been carried down between 400 and 500 ft. The vein is found to be 10 ft wide at the greatest depth.

Bunker Hill.—This mine is 1½ miles from the last named mine; and it is rumored that it is about to change hands. In the event that it does, operations will commence, which will give an impetus to the quartz interest in that locality.

Lewis Brothers.—This mine is situated in what is better known as the Big Basin, and was discovered by the Lewis Bros. several years ago. The ore is said to be extensively rich. Owing to limited means the boys are unable to place the necessary equipments on the claim. Like scores of other good mines in the county that are neglected, only await capital to develop and properly work them.

NEVADA.

WASHOE DISTRICT.

Union Shaft.—Gold Hill *News*, June 16: The foundation for the 2500 level plunger pump is being put in, and the station at that level is being opened up. When these works are completed the 2500 station of the Sierra Novada incline will be freed from water and drifts will be started from it to connect with one to be run from the Union shaft and with the drift toward that station from Union winze No. 1.

Yellow Jacket.—The drift from the 2328 station toward Crown Point is making the rapid progress of 10 ft per day, and is now 200 ft in length. Pump No. 13, at the 3000 level, is being put in place.

Sierra Nevada.—The drift west on the 2300 level toward the line of the main shaft is still searching for the west wall of the ledge, preparatory to raising to connect with the main shaft. The extreme heat north on the 2400 level still interferes with work in that part of the mine. As soon as the Union pump at the 2500 level is in operation, work will be resumed at that point.

Con. Virginia.—The drift formerly run south on the 2000 level is being cleared out, preparatory to starting the joint Best & Belcher winze from this level and continuing it to the 2300 level. The drift south on the latter level is making 25 ft per week, and is to connect with the joint Best & Belcher winze above mentioned. The usual output of ore is maintained, the average being about 230 tons per day.

California.—The usual quantity of ore is being extracted and sent to mill.

Union Con.—The northwest drift on the 2500 level, to connect winze No. 1 with the station of the Sierra Nevada incline, is again advancing. The drift south from winze No. 1 toward winze No. 2 is making usual progress through soft vein material. Winze No. 2 from the 2400 level is also making usual progress.

Gphir.—The drift north from the main east crosscut on the 2500 level is making usual progress through a heavy and promising vein formation. The connection between the raise from this level and the winze from the 2300 level has improved ventilation materially.

Choller.—Pumping and raising water as usual. From the south drift on the 2400 level the diamond drill has been sent 200 ft west, and has encountered a mixture of porphyry, clay and quartz giving low assays. This is from a point 165 ft south of the main drift west, the only place where the drill has been used.

Alta.—The east crosscut, 1950 level, is now in 180 ft, the face in porphyry. It is not yet far enough east to reach the quartz formation. Two tons of the base ore on this level have been extracted for the purpose of experimenting to ascertain the best method of reduction.

Bullion.—Since last Saturday's statement the drift east on the 2450 level and from the incline has been pushed 30 ft, and is in most promising quartz carrying some metal. The drift from the Bullion combination shaft and on the 2200 level, to connect with the drift east, has been driven 20 ft.

Belcher.—Work in the drifts both north and south on the 3000 level is once more making good progress. The material in the face of the south drift is without change.

Utah.—Still sinking the incline; total depth, 130 ft on the slope below the 1950 level. The southwest drift on the 1750 level has attained a total length of 525 ft from the incline and continues in good vein material.

Crown Point.—The east drift from the incline on the 3000 level was pushed till indications of water were encountered, when it was turned south toward Belcher, in which direction it has been run 15 ft.

Hale & Norcross.—The work of stoping out the ore encountered in the workings on the 2100 level has been commenced.

Gould & Curry and Best & Belcher.—The work of sinking and timbering the joint shaft is making 40 ft per week and the Sutro tunnel level will be reached about the middle of July; total depth to date, 1,280 ft.

COLUMBUS DISTRICT.

Northern Belle.—*True Fissure*, June 12: An average of 80 tons of ore is being shipped daily to the company's mills at Belleville. In the mine there are 155 men employed steadily. The 600 level, below the adit, is looking splendidly, and the indications are favorable for an improvement. From the top to the bottom the mine has never looked so well in a long time.

Gen. Jackson.—Ore was first struck at 15 ft from the surface, with the ledge pitching north 45°. At a depth of 45 ft the country became much broken up. This continued 45 ft, only occasional hunches of ore being found. At 90 ft a solid formation was reached, and the ledge at that depth was small, but is widening. The ore is of good character. The incline is now down 160 ft.

Lucky Hill.—The tunnel has now reached a distance of 450 ft. Progress is being made rapidly to cut the back ledge. The first ledge was cut at 350 ft from the mouth of the tunnel, from whence drifts were run east and west, both of which expose the ledge very finely. An upraise was made, 340 ft, on the pitch of the ledge, and a well-defined ore body developed the entire distance.

Mount Potosi.—The ore dump is full of first-class ore, and in a few days it is expected one of the Northern Belle mills will start up on it. There are 22 men stoping ore, which will keep the ore-house well supplied, as the number of men can keep a 20-stamp mill running. The ore is slightly rebellious, but easily worked. It is rich in silver, and carries about $15 in gold. It is taken from three different ledges, developed by a tunnel.

EUREKA DISTRICT.

Macon City.—*Sentinel*, June 13: The lessees of the Macon City have turned out to sink shafts and prospect generally in the public highways. A few days ago a seam of ore was uncovered in the main shaft, which seemed to dip from above, and after following it for a few ft they concluded to sink from the surface, and at once commenced to sink a 4x4 shaft in the middle of the wagon road. They had only gone a few inches when they uncovered a large chimney of first-class ore, which will run about $130. The chimney is extending in width, and promises to be the most important strike yet made in the mine.

Lilly.—Mr. E. G. Conroy has been taking out some quartz ore from the Lilly which assays $317. A seam was discovered on the surface and followed down a few ft, when it widened out to 20 inches, and seems to have a natural northeast dip. The ore is a fine granulated quartz and carries some fine carbonates. The owners have started a tunnel on the ledge, and are sanguine of soon opening up a large body.

Mining Notes.—Work is being pushed ahead in the Kit Carson, and the mine is reported as looking well. John H. Roberts has some fine ore on the dump of the Young Ophir, near the Charter tunnel, and reports the mine as looking well. P. Finnegan has located some likely looking ground adjoining the Antelope, on the summit of Prospect mountain. Ed. Looney has two men working the Mary Anu mine, on the western slope of Prospect mountain. The mine is opening out to be a valuable property.

ESMERALDA DISTRICT.

Grand Trunk.—*Herald*, June 12: The ore in this ledge is of the first quality, showing free gold all through, and would, in the opinion of the best judges, average not less than $100 per ton. After leaving this body of ore porphyry was run through for a distance of some 10 ft, when another ledge was struck, the ore of which shows equally well.

National.—The owners have taken out least 60 tons from the National within the past few weeks, and are still at work taking out ore. The average of the 60 tons now on the dump will not, we are told, fall short of $60 per ton.

Northern Belle.—There is a shaft on this mine 60 ft deep. Two drifts have been run south from the shaft a distance of 50 ft, and are both in good ore all the way. The average width of the ledge is 4 ft, carrying $30 rock. Over 100 tons of ore have been worked from the Northern Belle that yielded $30.

Centennial.—The winze is down over 100 ft, all the way in ore that will average at least $75 per ton. The ledge of the Centennial averages 4 to 5 ft. Three tons of this ore crushed last fall netted $1,800.

GALENA DISTRICT.

Mining Notes.—*Silver State*, June 10: We are told that J. A. Blossom, of Battle Mountain, disposed of the Trinity mine, at Galena, to Eastern men, who are now building a concentrator to reduce the ore. Also that the White & Shiloh Co. will start work on the mine shortly. Our informant visited Copper canyon, near Galena, where he found the Supt. of the English Co.'s copper mine excited over the discovery of a 4-ft vein of argentiferous galena on the 530 level of the mine. What percentage of silver the ore carried had not been ascertained at the time of his visit, which was shortly after the galena ore had been discovered. At Lewis he found the Star & Grove mill running, and plenty of ore in sight in the mine.

Important Discovery.—John Biggs, who has been prospecting for a few days at Willow creek, informs us that Lee Folsom has discovered a lead not over a mile from the station, the croppings of which assay $106 to the ton, $67 in gold and $42 in silver.

OSCEOLA DISTRICT.

Gold Plateau and Quartz.—Cor. *Southern Utah Times*, June 3: This district is situated on the northwestern slope of the Snake Range of mountains, in White Pine county, State of Nevada. It is one of the richest gold-producing districts in the State above mentioned, but unfortunately developments have been greatly retarded from the lack of water. One of the richest gulches goes by the name of Dry gulch. Messrs. W. S. Godbe, B. Hampton & Co., have purchased a great number of claims in this gulch and are at present having surveys made for the purpose of bringing a good stream of water to the head of the same. There are numerous other claims in the same place, and fortune is favoring the lucky owners this year for a good sluice stream of water is running down caused by the melting snow near the summit of the mountains. The whole gulch is lined with men working like tigers day and night, for the water will not last over six weeks or two months. To show how rich the gulch is we need only state that these men are now washing the strippings or refuse dirts and are obtaining from $10 to $15 to the man per day. Besides the placer claims, which abound in and about Osceola, there are several first-class gold-bearing quartz ledges.

PYRAMID LAKE DISTRICT.

Jones and Kinkead Mine.—*Territorial Enterprise*, June 10: We learn that about 40 tons per day of free milling ore are being taken from the 300 level of this mine. This ore is being piled up for reduction as soon as the mill is ready to go into operation. On the 400 level they are drifting south. The drift is out 131 ft, and it is expected that the lead will be cut in about a week. The ore on the 400 level contains a great deal of copper. A quantity of it has been sent to Denver for reduction as an experiment. The Jones and Kinkead is at present the leading mine of the Pyramid Lake mining camp, and should it be found that the ores it produces can be profitably worked, renewed activity will be seen in all that region, there being quite a number of veins on which more or less work has been done in the way of running tunnels and sinking shafts.

REESE RIVER DISTRICT.

Manhattan Co.—Letter of the 11th says: During the week the mill has reduced 143 tons 616 lbs of ore of the assay value of $48,570.93. Of this amount $3,668.30 were from the Curtis shaft, $3,644.94 from the Ruby incline, $18,155.90 from custom ores, and $23,101.70 from tribute ores.

WHITE PINE DISTRICT.

Con. Treasure.—*News*, June 10: The property consists of the Central Treasure and Bay State mines on Treasure hill. The main shaft, now being sunk on the Bay State, will be one of the best on the hill. A drift has been run from shaft No. 2 to connect with the main shaft at the 100-ft station, as soon as the latter reaches that depth. This connection will furnish good ventilation for all future prospecting. Work on the main shaft will be pushed as fast as possible.

ARIZONA.

Calabasas District.—Tucson *Citizen*, June 10: Mr. B. N. Brajovich, partner of Joe Sresovich in the Brothers mine, has just returned from Calabasas with some fine specimens of gold-bearing rock. This mine is the eastern extension of the Gold Hill mine, is situated in the Mohave mountains, 1 mile from the Santa Cruz river, and is distant about 70 miles from Tucson. Though only down 10 ft, the rock is rich and constantly improving in quality. Fifty thousand dollars has just been refused for an adjoining mine, and Mr. Sresovich says the Brothers mine is not for sale, as he intends to work it himself. A party fully equipped with tools and provisions will leave Tucson for the mine on Saturday.

Globe District.—Phœnix *Expositor*, June 11: Another rich strike has been made on the Albert Lee. The Lee bids fair to be one of Globe's bonanzas.

Rich Silver Ore.—About 16 miles south of Globe, in the Pinal mountains, a high-grade, galena, silver-bearing ore body has been struck, measuring 5 ft from wall to wall, the ore brought into town assaying from 300 to 800 ounces in silver, besides carrying about 40% lead. Plenty of wood and water in the immediate vicinity of the ledge.

Strike at McMillen.—Mr. Arthur and others from McMillen have struck it way up near Rambor camp. The ore is a chloride and native silver with a light copper stain. Six sacks of the richest found so far represents a value of $4 a lb.

Silver Era.—In the Silver Era a big pocket of 700-ounce ore has been struck, at a depth of 160 ft only.

Richmond Basin.—Neither is Richmond basin behind in the discovery boom. Several new locations yet bid fair to rival in richness the old-time bonanzas there.

Santa Ritas.—Tucson *Star*, June 11: The Goldtree mine is attracting a great deal of attention. It is one of the best locations in Major camp. The shaft is 14 ft deep, and there are 40 tons of assorted ore on the dump. Assays show $116 in silver and 50% lead. The owners are preparing to erect a smelting furnace.

Tombstone District.—*Epitaph*, June 12: The Head Center is daily improving. On the 210 level there is an ore body 350 ft in length and 3 or 4 ft in width, which the Supt. says will average at least $100 per ton. The drifts on this level are being extended both north and south in good ore.

Tough Nut.—On the 125 level, connection has been made with the shaft and a breast of ore opened up 20 ft in width; this will pulp $200. No. 2 winze, 150 ft east of the northwest shaft is now 55 ft deep, all in ore that will go $90 to $100, and improving in character as depth is attained. East from the main shaft 150 ft a crosscut of 18 ft, through 8 ft of porphyry and 10 of carbonate ore, leads to a winze 32 ft in depth, in magnificent ore all the way down.

Grand Central.—On the 200 level, drifts are being run north and south along the ledge. The south drift is in over 100 ft, and the miners have run north toward the Contention about 88 ft. At 70 ft in this drift a handsome ore body was struck which continues good in the face of the drift. This strike has produced some of the handsomest chloride specimens we have seen in the district.

Tombstone seems to be enjoying a season of prosperity. The Sycamore water company is pushing the laying of pipe, and will soon have plenty of water.

COLORADO.

Clear Creek Co.—Georgetown *Miner*, June 5: The Baltic is one of the best mines in this section of the country. They have now reached 220 ft below the Britannic tunnel lode, and have a 5-ft streak of 100-ounce ore. The work of developing the mine goes on very rapidly.

A. V. Still Lode.—Capt. McGuire and Henry Warron are the owners of this lode, and undoubtedly have a bonanza. They have 2 ft of solid mineral, which will run 500 ounces of silver to the ton. This mine is bonded to Eastern capitalists for a large sum.

Niagara Tunnel.—This property consists of 12 lode claims lying in Spring gulch, about 2½ miles from Idaho springs. The principal developments are on the Niagara and Byron lodes, which have been intersected by the Niagara tunnel and explored by drifts 50 to 60 ft in length. About 200 tons of ore, ranging in value from $30 to $90 per ton, net, have been taken from these lodes during the process of development. The Donaldson possesses the largest share of developments. It has been opened by several shafts which show from 12 to 26 inches of auriferous quartz worth from $71 to $431 per ton.

Dominion Mining and Smelting Co.—This is a comparatively new company, and is operating in Hukill gulch. The Dominion lode is opened by 4 shafts, aggregating 165 ft in depth. These developments show a pay vein 18 inches in width, consisting of iron pyrites, copper pyrites and galena, the galena predominating. A late run of 75 sacks milled $337 per ton in gold, silver and lead, the latter running 35%. Specimen assays have run as high as $600, but the best criterion of the value of the property consists in the fact that it paid for development, and also that a small run is taken out nearly every week.

Custer County Mines.—Silver Cliff *Prospect*, June 8, The Polonia has 2 shafts respectively 95 ft and 102 ft deep, and from both very rich ore is being taken. The vein proper from wall to wall is 4 ft, with a 14-inch pay streak of gray copper that is widening with every ft of depth gained. The mill runs from the present depth are from 65 to 300 ounces in silver. Assays from the same have run as high as 800 ounces in silver. A 20-horse power engine has been ordered and will be at work in a short time. The 05-ft shaft, in which they are now at work night and day, will be sunk to a depth of 700 ft, with a number of levels from different depths. The ore from this mine is being milled as fast as taken out.

Horn Silver Mine.—Work has been resumed on this mine, the parties to whom it was bonded being in forfeit. We trust the owners will profit by their experience, and will, with the 2,000 tons of 30-ounce free milling ore on the dumps, proceed at once to erect a large mill and become large producers of bullion.

IDAHO.

Challis.—Cor. Yankee Fork *Herald*, June 5: The smelter which has been in course of construction at Bay Horse, under the management of Mr. Longmaid, has come to a standstill for the present, but will soon be resumed.

Another Furnace.—It is said that another smelting furnace will be put up on the Salmon, opposite the mouth of East Fork, under the auspices of an Omaha company. It is asserted that the requisite capital is in hand, and that the work will be commenced at once and prosecuted to completion with all possible vigor.

Upper Salmon.—Owing to the extraordinary inclemency of the winter, and the isolation of the country from the great railroad world, the Upper Salmon is long in getting a start; but when once it is given a chance, it will keep up its reputation as the greatest producer of the metals, precious and useful, between the Rockies and the Pacific.

MONTANA.

Butte District.—*Miner*, June 12: The middle shaft on this mine, in which a strike was recently reported, is down 130 ft and work is still being vigorously prosecuted. The lower level, running east from a point 100 ft from the surface, is about 50 ft in length and is yielding some magnificent silver ore carrying also from 30% to 50% copper.

Anselmo.—This sterling property is growing daily more valuable. The east and west drifts, 70 ft from the surface, have each penetrated the ledge about 88 ft and show a handsome body of very high grade silver quartz.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

New York & Bodie M. Co.—Object: To carry on a general mining business in California. Capital, $5,000,000. Directors—W. S. Chamberlain, G. E. Hutchinson, J. M. Masterton, H. A. Johnson and E. W. Whitney.

Mexican Union M. Co.—Object: To carry on a mining business in Columbus district, Esmeralda county, Nev. Capital, $10,000,000. Directors—George Storey, Victor Fernbach, D. Fay, Frank Tagliabue and U. Mayers.

Constantine G. M. Co.—Object: To operate in Mariposa county, Cal. Capital, $4,000,000. Directors—David Porter, N. C. Fassett, A. F. Main, H. N. Jacobs and Geo. Storey.

Southern Nevada G. & S. M. Co.—Object: To operate in Esmeralda county, Nev. Capital, $10,000,000. Directors—H. L. Coye, J. G. Lavery, H. L. Fox, E. E. Elliot and J. J. More.

Carbonca M. Co.—Object: To mine in Sonora, Mex. Capital, $10,000. Directors—S. F. Gashwiler, J. W. Roberts, C. A. Burgess, C. F. MacDermott and G. W. Grayson.

Chicago Con. S. M. Co.—Object: To mine in South Fork district, Shasta, Cal. Capital, $10,000,000. Directors—F. H. Wells, E. C. Freelsnd, William Irelan, John Nuttall and P. B. Bowles.

Tombstone Mining District.

Description of its Geological Features and its Principal Mines—Resemblance to the Comstock.

The following description of Tombstone district and its principal mines is based on notes taken by Mr. E. N. Riotte, M. E., during a recent professional visit to Arizona. Mr. Riotte is wsll known in the profession and the mining community, and his observations and conclusions will be received with great consideration.

Topography—Wood and Water.

Lone monntain, half way up which the town has crawled and nestled, rises gradually from an almost circular basin about 30 miles in diameter. San Pedro river winds fully half way around the base of the mountain, which rises about 1,500 ft. above the subjacent plain. At the date of Mr. Riotte's visit, during the latter part of May, Tombstone had a livsly population of 3,500 to 4,000, and there were perhaps 500 houses, which had been mostly hastily improvised. All the water is haulsd from wells sunk in the granite about three miles from ths mines. A copious supply of water could be procured from Huachuca monntain, 22 miles distant. There is no wood whatever in the vicinity of the district, but both lumber and wood are brought from Hnachuca. The introduction of water would effect a large saving hoth to the town and the mills, and would besides permit the reduction of thonsands of tons of ore which have no present value. The cost of water for the hoisting works alone amounts to hundrsds of dollars.

Geological Features.

Lone monntain proper consists of porphyry of a fine-grained feldspatic variety, generally stratified and uplifting east and west. Upon the porphyry rested a limestone, probably of the triassic age. A young, square-blocked, fine-grained granite, which outcrops heavily towards the northwest, is the evident cause of the upheaval of the mountain. The presence of "hlack" dikes—that is, ledges of grayish-black basalt—would appear to indicate the mors or less direct causes of the veins and ore deposits, The limestone is highly mstamorphic and alternates with what was once sandstone, but now quartzite, and agaiu with what was once clay slate, bnt now argillaceous schist; at places, indeed, almost gneiss. Every indication points to the exceedingly intersting proposition that the veins and ore deposits in this district were formed before the upheaval of the mountain mass occurred. In eupport of this theory the following reasons present themselves: 1. There is no sign of solfataric action on the surface. 2. The veins, eo far as observed, do not enter the granite. 3. The depth to the water is so great that it is improbahle that springs or other water ever passed up to the surface in its present condition. 4. The decomposition of hoth the ore and the gangue has been done from above, the porous earth and ledges allowing a free passage downwarde of the eurface water. If this theory is correct, the veins will be found still better filled when the water level is reached, let us say, at a depth of at least 400 ft. Thie eetimate is based partly on the hight of the water in the welle, which ie retained, wherever it ie found in this place, by the fine-grained, eolid granite.

Characteristice of the Veine.

The Contention is at present the most valuable mine in Tomhstone. It is a representative fissure vein—a veritable "veta madre." It is so strong and palpable that no competent person hesitates for a moment in giving a decided judgment as to ite character. Even the Comstock devotee, after a glance at the splendid vein, raises his hat and exclaims with pride: "Yee, this is another." In places the walls are over 100 ft. apart. Bnt eo far the best ore body developed has been about 15 ft. wide—that is, yielding ore of a high grade. The clay eelvage on the walle is distinct, and the cleavage of the country rock ie perpendicular to the ledge. The so-called foot or east wall has at the surface a dip of 65°, while the dip of the west or hanging wall is somewhat less. As depth is gained the east wall straightens, and at a certain depth both walls go down nearly perpendicular. Judging from the indications in the Contention and the Head Center there is every chance that the great vein will finally pitch to the eastward. The east and west country rock is lithologically identical—propylite or porphyry. The east country rock exhibits more decomposition, or the action of steam or hot water. This appearance would eeem to strengthen the indications already stated, that the east or footwall will become finally the hanging wall. Thie feature of the vein will at once arrest the attention of every one familiar with the peculiaritiee of the Comstock.

The filling matter of the vein is partly quartz very much decomposed, and partly "horse" matsrial. The grayish porous quartz is invariably rich, the silver-bearing mineral being chloride, bromide and iodide, and chloro-bromide ores. Where the country rock has fallen into the vein it is found to be seamed and decomposed; and on the facee of the seame are pieces of chloride ore varying in eize from a pin to that of a man'e hand and as thick as a half dollar. This greenish horn silver so fully impregnates the seams of the country rock that it pays to mine. In the Head Center the sidee of a drift for the length of about 15 ft. are covered with small points of free gold; and fully one-fourth of ths bullion produced from the ore of this mine is gold. It presents similar characteristics to the Contention, including the basalt dikes. The three mines known to be on this great vein are the Contention, Head Center and Grand Central; it is probable that the ore passes through the Tranquility and Empire.

The Contention

Is nearly 300 ft. deep. It has a good mill of 20 stamps on the San Pedro river, 9 miles from the mine. Hauling ths ore costs $4 per ton. The present yield of the mine is about 50 tons per day, and scarcely shows the beginning of stoping. The ore is free milling, and is worked up to 80% and 85%, and the bullion is over 800 fine. The daily product of bullion ranges from $5,000 to $7,000. The cost per ton for mining, hauling and milling is about $17.

The Head Center

Is located about 100 ft. lower down the mountain sids. It is about 300 ft. deep, and is, therefore, the deepest mine in ths district. It has been opened systematically and thoroughly, and discloses the vein in all its perfection in the deepest working. No ore has yet been stoped, and as little as possible of the rich horn silver has been broken down in running the working drifts. Still there are from 300 to 400 tons of very high grads ore on ths dumps, plainly showing the presence of both vein and ore. The mins is quite ready for a large mill.

The Grand Central

Shows the vein at one end just as it is in the Contention; bnt in passing through a ridge of quartzite it has been somewhat pinched at one point. Beyond this fault the ore body continues very regular, and averages about 4 ft. thick, 2 ft. of which are of high quality.

Other Mines

Ars, as yet, nnimportant. The Tough Nut, although producing a large amount of good ore, is simply a series of bunches or nests in the limestone—an exact counterpart of the occurrence of ore at Mineral Hill, Nevada. Besides the mines mantioned thsre are several small, well-defined veins with holss from 20 to 40 ft. deep, which are offered at prices to suit every condition. There is no doubt that the Contention, Head Center, Grand Central and other locations on the great vein will bs worked and heard of for many years to come. The bulk of the others will answer the purpose of the "chloriders"—a class of miners indispensable to a lively camp.

Town Sites Located on Mineral Lands.

Recently Secretary Schurz, in answer to the resolution calling for the information, transmitted to the Senate a report from the Commissioner of the General Land Office concerning the entries of town eites on mineral lands. In his report the Commissioner exhibits the practice of the office under the laws, and cites instances of the difficulties which have occurred where town eites have been located on lands valuable for placer mining. After pointing ont the defects in the existing laws, the Commissioner suggests that if a new law be enacted it should embrace the following requirements:

"1. Where the mineral locatione of lodes or placer mines antedates the town occnpation, the patent should issue without reservation to the mineral claimante. 2. Where the land is occupied as a town prior to the mineral location, and the character of the town occupancy is clearly permanent and in good faith, the same rule of priority should control, and the patent, without reservation, ehould issue to the town authorities, without regard to the character of the land. 3. Where the ground is known to be mineral in character, the location of mining claime and buildings, and the occupancy of dwellings, etores, etc., proceed contemporaneously, a very difficult question of fact arises in every case. When surface occnpants have decided upon a permanent organization, it is in their power to immediately apply for a patent, and if any delay in the preparation is necessary, they can at least give a published notice of their claim, with its bonndaries, and file the same in the district land offices; and this would he a full notice from its date to all subsequent locations of mining claims, and of the rights of the town to unlocated grounds should attach, and the patent issue without exception in favor of each of the enbsequent locators, while the prior location, made during the period when everything except mining location was considered as transient and calculated only for temporary purposes, should not be embraced in a town-eite entry, but subject to entry and patent without any reservation, by the individual owners thereof."

Secretary Schurz concurred in the suggestions of the Commissioner.

A Novel Process.—Quite a novelty in metallurgy is reported to be one of the features of a new chlorination process, and consists in the separation of the gold by filtration through or agitation with charcoal (or bone-black). The gold is thereby reduced from its eolution and precipitated in the metallic etate on the surface of the charcoal, coating the fragmente with a brilliant film of gold. This singular phenomenon seems to be a physical and not a chemical actiou.

On Geodes.

By Chas. D. Cibbes, C. E.

This interesting specimen presented this evening by Mrs. D. D. Colton, whethsr it is a geode or not, cannot be passsd by without some remarks. I will state a few facts that I have observed, and lsave it to those better informed on the subject to give their opinion on the formation. Not seeing them in place renders it mors difficult to determine. But perhaps there is some member present who has bssn on the gronnd and can describe them more accurately.

Here is a cylinder 10 inches in diameter, of a very regular shaps, nearly a perfect circls; and the longitudinal section 9 or 10 inches; both ends heing broksn off it is impossihle to determine the original length. The rim of this cylinder is of a regular sizs, just 7·20 of an inch thick. It is composed of a fine silicious, agatizsd dsposit from a solution of silica. The extreme outsr edge, about the thickness of the back of a table-knife, is translucent, resembling opal; the rest of the rim is opaque, with two very narrow bands of different tints on the inner edge.

The cavity of this cylinder is lined with granular quartz nearly two inches thick. The inner surface, however, is studded with crystals of quartz pointing towards the center. The bottom, or one end of ths cylinder, contains a convexed cluster of quartz crystals radiating from the csntsr. Interspersed with the white quartz crystals are a few brown crystals of calcits, not more than two dozen, showing that a small portion of lime was also held in solution. Now the question arises, what was ths matrix in which this cylindsr was formed, was it a geode or not?

Webster delines a geode as a rounded nodule of stone containing a small cavity nsually lined with crystals, though sometimes with other mattsr.

In 1877, I exchanged some of our duplicatss for several specimens from Chnrch Buttes, said to be fragments of geodes, which are here exhibited. Two of thsss ars similar in composition to the one presentsd by Mrs. Colton, that is, they have the agatized rim and the crystallizsd quartz. The diameter of the largest segment when perfect was 12 inchss, and the rim is twics as thick, and like the psrfect cylinder has no matrix surrounding it. But you will perceive in the smaller segment that the rim of silica has an outsr coating, about 8-10th of an inch thick. This is mostly calcareous matter, but contains some silica, and somewhat resemhling solidifisd mortar, the outer surface being smooth aud as perfect as the innsr circle. As near as I can judge from this small segment, the diameter must have been 15 or 16 inchcs. A third specimen showe a solid and more compact form of the agate deposit. Two other specimens are crystals of calcite instead of quartz, also found in geodes.

New Gold-Saving Machine.—The editor of the Mammoth City *Herald*, Mono Co., has been ehown a letter received from France, describing a contrivance for working tailings from placers. The writer eays: "My apparatus has been working for eome time with great success in the province of Marcia, Spain, and I cannot see why it should not work with the same results on the Pacific coast, where there are so many unworked placers and quartz mines. My apparatus can be built so lightly that it can be easily packed on mules and moved from place to place as necessity requires. It necessitates the uee of very little water, as one and one-fourth cubic yards of water will wash one cuhic yard of dirt or sand, and by working with care the result is absolute—without any loss whatever. The first experiments were made in Paris, where twenty colore were filed from a gold coin and mixed with six cubic inches of sand. After washing with my machine the quantity of gold remained intact. For dry diggings the machine would be of no use, for it requires a emall amount of water. Gold placers and quartz-hearing gold are better worked by my process than any other, as there is no loss whatever; the smallest particles cannot escape—even the float. Tailings have been worked in Portugal, and all the gold extracted at a trifling expense."

The Skagit Mines.—A dispatch from Seattle, W. T., June 3d, says there are at present about 400 men in the diggings, all well provisioned, and, so far as the old miners were concerned, were well satiefied. The snow has entirely disappeared from the creeks and benches, which are already dotted with miners' cabins, and in many instances with little garden patches, on which lettuce, cabhage, beets, potatoes, etc., are already well advanced. The water is still so high as to render sluices and flumes impracticahle. However, considerahle gold is being taken out with pans and rockers. The trail is completed from Portage to Goodell's, while the first pack train, consieting of five animals, ie expected to start ont from Souk City, on Satnrday, for Goodell'e. The most difficult portion of the trail still remains to be constructed, but it is expected that considerable addition will be made to the present force, and work will be puehed through rapidly. The new eaw mill at the mouth of Canyon creek is expected to be turning out lumber in about a month.

The quartz excitement about Auburn still continues, and new ledges are being prospected every week. From one of them the fortunate owner exhibite a handful of specimens containing over $300.

Recent Decisions Relating to Patents, etc.

We give below brief abstracts of decisions* rendered upon patent cases in litigation, for the benefit of our readers:

DECISIONS OF THE U. S. COURTS.

Sharp vs. Tifft.

U. S. Circuit Court, Southern District of New York—Decided May 8, 1880; Wheeler, J.:

1. Substantially the same combination of devices, although of different form and capacity, having been used before the patentee's invention, he is entitled only to his particular form of devices which are really different, and the combination of these dovices with each other or with others so as to produce a new result or an old result in a new way.

2. A reference in a disclaimer to a particular form of the device not so limited in the claim is merely descriptive of that form without taking away or adding anything thereto.

3. When the reissue describes only what was described in the original patent, both as to the devices and the nature of the invention, it cannot be said that the invention in one is different from that in the other, although the claims have been changed and enlarged.

4. A patent for a combination of parts, materials, or elements is not infringed by the use of any number of the parts, materials or elements less than the whole.

5. When some parts of the combination are new, and those parts are taken and used in the same manner, but with different elements for the rest of the combination patented, a part of the invention is taken, although the whole is not, and it is an infringement to that extent.

6. A disclaimer filed after the suit was brought ordinarily deprives the plaintiff of costs in the suit, but where the disclaimer was not necessary to sustain the patent to the extent it is held valid, was inoperative, in the view taken of it, upon the patent and has no effect in maintaining the suit, cost may be allowed the plaintiff as though no disclaimer had been filed.

This suit is brought upon letters patent No. 50,938 issued to T. J. Kelly for an improvement in burners for gas stoves, dated Nov. 14, 1865, and reissued to the plaintiff No. 6,832, dated Jan. 4, 1876.

The defenses set up and relied upon are that the reissue is for an invention different from that described in the original; that if not, Kelly was not the first inventor of all the material parts of the invention patented, and that the defendant does not infringe.

A decree entered for an injunction and an account accordingly, with costs.

Allen ve. City of New York.

U. S. Circuit Court, Southern District of New York.—Decided Dec. 13, 1879; Wheeler, J.:

1. Reissued Patent No. 21, to Aaron H. Allen, Jan. 15, 1861, for improvemente in seats for public halls declared valid.

2. The seats in the original patent were to be turned up by weights, while in the reissue the weights may be dispeused with and the seats moved up otherwise: *Held*, that the reissue is not for an invention different from that contained in the original patent.

3. Although the stove door, carriage-seat for a child, an opera-board to a carriage, relied upon in defense, are turned down, stopped, and held, and turned up out of the way as are these seats, such contrivance are not anticipations of this invention, since they could not be arranged as seats in public halls without additions and alteration requiring the exercise of invention.

4. A description in a prior patent is no anticipation of a patent the application of which was filed before the application of such prior patent.

5. The defendent in this case is a proper party to account for profits, as are also its board of education and department of instruction, by whom the seats constituting the infringement were introduced into the schools.

Perkins vs. Nashua Card and Glazed Paper Co.

U. S. Circuit Court, District of New Hampshire.—Decided May 15, 1880; Lowell, J.:

1. As the law seeks to encourage inventors to make known their inventions and to discourage an extension of the monopoly beyond the statutory period, and because of the difficulty in determining the amount of knowledge derived from the exhibition, publication and use of an invention, it has always been held that where the public have had means of knowledge of an invention they have had knowledge of the same.

2. To establish the fact of public use, actual knowledge of the invention need not have been derived by anyone interested to practice it, but it is enough that anyone or more persons, not under pledge of secrecy, saw the invention, or even might have seen it if they had used their opportunities, provided it was, in fact, practiced in the ordinary way after being completed.

3. Where there has been no pledge to secrecy the visitors and workmen at a factory must be held to be either part of the public or persons from whom the public may acquire the art without breach of trust.

4. *Doubted*, whether a pledge of secrecy exacted of a number of workmen who had nothing to do with the machine in question, and had an opportunity to examine it, would make the use a secret one.

5. A machine which, whether entirely satisfactory or not, has been run in the ordinary course of business for 20 or 30 years, and which is patented precisely as it was used, cannot properly be called an experimental machine.

* More complete reports of the proceedings may be found on file in the office of the Mining and Scientific Press Patent Agency, 202 Sansome street, S. F.

Perplexed Writing Experts.—The experts in handwriting have a very tough joh on hand at Washington just now, in the mysterioue letter which was received by Springer, apropoe of the Donnelly contest. The peculiarity about this letter is that the handwriting closely reeembles that of several people. It is very like the writing of Finley, of his clerk, of King of Minnesota, and lastly of Springer himself. It will be remembered that Springer attributed it to Finley, Donnelly to King, and now some people are inclined to think that Springer may have written it himself. This puzzle serves to show that it is by no means easy to trace handwritiug, and that the conclusione of experte upon the identity of handwriting may be entirely erroneous, no matter how careful their researches. There are at present many thousands, or hundreds of thousande of people, who write a bold, round, commercial hand, having a etroug general resemblance. Those who are taught in the modern echools perhaps acquire lese individuality than wae common of old, and this may be one cause of the embarrassment which the Washington letter is creating.—*Sacramento Record-Union.*

Placers in Klamath Co.—Placer mining on the Klamath and ite lower tributariee covere a linear extent of over 200 miles, reaching from the main stream down almost to the ocean, a distance of 120 milee, and along Scott river and the Salmon some 50 or 60 miles, some little work being also done on the smaller branches of these rivers.

The Engineer.

The Proposed Illinois Ship Canal.

Mr. Daniel C. Jeanne, Chief Engineer of the Illinois and Michigan canal, contributes to the Chicago *Inter-Ocean* the following account of the proposed through water route from the great lakes, at Chicago, to the Mississippi river:

The first division of the project consists in the enlargement of the Illinois and Michigan canal from Chicago to Joliet. The present canal was built 48 ft. wide on the bottom, 60 ft. surface width at six ft. deep, or below the low water of Lake Michigan. It is proposed to make the enlarged canal 144 ft. wide on the bottom and 160 ft. wide at surface at eight ft. deep, with a descent of two-tenths ft. per mile. This will give a current of 1.06 miles per hour.

The canal enters the Desplaines river about one mile and a half north of the main street at Joliet, and will be about 33 miles long. Three lift-locks will be required at the southern end, one grand lock at Bridgeport or north end, six public road and street drawbridges, and one double railroad drawbridge, and a large water weir at Lockport. The locks are to be 350 ft. long between the gates and 75 ft. wide, to correspond with those now built on the Illinois river.

The second division of the canal from Joliet to La Salle, about 67 miles, will consist of the improvement of the Desplaines and Illinois rivers by locks and dams, and an independent short piece of canal around the rapids at Marseilles. This will require the construction of 11 locks, 9 dams, the raising of two dams, 9 drawbridges, the independent piece of canal above referred to, and other incidental work.

The third division consists in the improvement of the Illinois river from La Salle to Grafton, on the Mississippi river, distance 227 miles. Of this, 90 miles have been finished by the construction of two locks and dams.

Total estimated cost of the entire work will be $18,296,918, of which amount $1,336,107 has already been expended. According to this estimate the canal, 327 miles long, will cost $55,560 a mile, and will have 12 times the capacity of Erie canal, which cost about $90,000 a mile. This route opens an inland water communication between the Gulf of Mexico, New Orleans, St. Louis and other cities of the great West and Southwest, through the city of Chicago, with the city of New York in one direction, and with the cities on the St. Lawrence river and the Gulf of St. Lawrence in another direction, and through both routes and the extremes with the Atlantic ocean.

The dimensions of the proposed canal are sufficient to admit boats of 2,500 to 2,800 tons burden, being 80,000 to 85,000 bushels of grain, or one and a half to one and eight-tenths million feet of pine lumber; or fleets of smaller boats can pass the locks at the same time with about the same tonnage, or 12 of the boats of the Erie canal, or the Illinois and Michigan canal, can pass the locks at one lockage.

The summit level of the canal could be reduced to 100 ft. on the bottom with the same slopes and declivity, and construct basins at every mile 500 ft. long and 50 ft. wide for boats to pass, and reduce the cost of the first division about $4,000,000, and these at 10 ft. deep would pass over 100,000 cubic feet of water per minute.

NEW METHOD OF CONSUMING SMOKE.—It is well known that the cause of smoke is that the fresh air, entering the incandescent coal from below through the grate, has often all its oxygen consumed before it has passed half way through the layer of coal, so that the upper part of the layer cannot burn, but is simply heated by the underlying incandescent coal, while the products of the combustion of the lower layer of burning coal pass through the upper heated but not burning layer, and carry with them the combustible gases evolved by the heat, but which cannot take fire from the want of free oxygen. In order to furnish these combustible gases ascending through the upper layer of coal with the necessary oxygen to burn, Mr. Benjamin F. Sherman, of Ballston, Spa., N. Y., has devised a means of introducing air in the furnace with a downward injection upon the fire by a vertically adjustable arrangement of pipes, which may be placed close to the coals or further from them, according to the requirement of the case.

LAUNCHING A BRIDGE.—In constructing a railroad bridge over the river Ranee, at Dinard, in France, the engineer decided to build the bridge on the shore and launch it over the river. The bridge weighed, when it was complete, 2,600,000 pounds, its hight above the river was 100 ft., and the span 314 ft. Twelve windlasses were used to draw the bridge into its place. It was supposed that four or five days would be sufficient for the work, but, in consequence of the breaking of a chain, two weeks were required.

GREAT INCREASE OF TONNAGE.—The shipping of the world is now estimated at 20,000,000 tons, which is 10-fold greater than the figures of two centuries ago. It is especially noteworthy that it has doubled within the last 25 years. Accompanying the increase in tonnage, there has also been a vast increase in speed, so that the amount of maritime commerce now is at least 40 times greater than in the year 1680.

Useful Information.

OLEOMARGARINE appears to be coming largely into use in many parts of the East and in Europe, and, so closely is it made to imitate butter, that a loud demand is being made to prevent, by legal enactment, the growing deposition to palm off this compound for the genuine product of the dairy. It is claimed that, while the fullest liberty should be given to every one to smear his bread with whatever he may choose to put thereon, some law should be devised to protect people from even the chance of ignorantly swallowing that which, knowingly, they would not take into their stomachs; that when hog, and dog, and cat are thrown upon the market in such minute division that their anatomy cannot be plainly made out, their proper place in nature shall be plainly made known by labels. Let oleomargarine go from factory to mouth as oleomargarine, and not let it be passed off for its country cousin. Make it slander, if deemed, to call it "bull-butter," but make it felony to say that it is Alderney. Many ways have been suggested for the detection of oleomargarine, one of the best of which is the microscopic test. Under the glass, milk-butter shows a mass of globules similar in size and appearance, with intermediate layers of salt and water. Oleomargarine shows a mass of what appears to be fan-shaped and fibrous crystallizations entirely different in character and appearance from butter.

A PECULIAR case in relation to weighing scales has recently been decided in an English court, which may be of great interest to scale makers and users in this country. It seems that there is a scale known as Salter's Family Seale, which consists of a bowl-shaped scale on an upright pillar and a finger and dial regieter underneath. It is said that 40,000 of these scales are made every year, and thousands of them are in use in the government departments. It was alleged by the prosecutor in this case, that by placing the goode to be weighed on one side of the scale, and not exactly in the center, the weight was erroneously registered, sometimes to the extent of several ounces. The defendants, being a Manchester firm who had sold one of these scales, were found guilty of the charge of having sold a false or unjust balance, and were sentenced to pay a fine of 20 shillings and costs. As might be expected, the case is to be taken to a higher court.

WAXING FLOORS.—The following is a good recipe for waxing floors and the method of application. Stir 25 parts of shredded yellow wax into a hot solution of 12 parts of pearlash in soft water. Keep the mixture well stirred until the effervescence ceases; then remove it from the fire and stir in 12 parts of finely ground yellow ochre. It may now be poured into cans to cool. When wanted for use one part of it is dissolved in five parts of boiling water. Apply warm with a paint brush. It dries in a few hours, when the floor is polished with a floor brush and afterward wiped with a woolen cloth. It is said this wax coating will last for six months with ordinary use.

FERNS AS FOOD.—Most of the ferns found in our woods contain more or less starch, and when properly prepared are extremely palatable and nutritious. An attempt was recently made in France to popularize them as an article of food. The young shoots of the common brake fern, when exposed above the soil to the air and sunlight, become exceedingly fleshy, white and tender. A famous French painter is known to pride himself on his fern omelets, and the hill tribes of Japan live on fern all the year round. In spring they eat the tender leaflets, and later in the season they eat the starch extracted from the roots.

"BONSILATE."—A new industry is reported to be growing up in Newark, N. J., which which yields a product suitable for many purposes. "Bonsilate" is the name given to this substance, which it is claimed, will take the place of ivory, rubber, celluloid and similar materials. It is said to be composed chiefly of finely ground bone, agglutinated by some cementing compound, which, when in its plastic state, can be molded into shape.

MAGNETIC WRITING.—Prof. Thompson, of Bristol, has lately made an interesting observation in regard to an application of magnetism. He takes a thin plate of hardened steel and writes upon it with a magnetized iron style, thus communicating a tolerably permanent magnetism to the parts of the plate which are covered by the writing. If fine iron filings are sprinkled upon the plate and the plate is then held perpendicular, so as to remove the loose filings, the writing becomes visible upon the magnetized portion. The experiment may be repeated at pleasure for an indefinite period.

UTILIZING SLACK.—The vast amount of fuel in the form of "slack" or "duet coal" which is now wasted suggests a promising field for inventive genius. Anyone visiting the coal regions is astonished at the quantity of this refuse thrown out of each mine. These heaps of fine coal loom up like small mountains, and often contain, it is said, a million tons, all of which can be burned. The Philadelphia & Reading company has a process for consuming this waste in some of its stationary and locomotive furnaces, but compared with the aggregate produced the amount thus disposed of is trifling.

ARTIFICIAL AMBER.—Articles made of imitation amber are now produced in immense quantities and of beautiful appearance, and sold for the natural material. The resembling substance thus employed is principally colophony—a resin obtained by the decomposition of turpentine—though many other ingredients are also made use of to give it the requisite qualities. So perfect is the imitation said to be, that the false substance has the electrical properties of the true, and some ingenious fabricators have even managed to introduce into the substance foreign bodies, insects, etc., to render the similarity more striking. The means of detection are simple. Genuine amber requires a heat of 545° to 550° Fah., to melt it, while the spurious substance becomes liquid at a much lower temperature. Again, while the true article is only slightly attacked, after a very long time, by ether and alcohol, the imitation rapidly loses its polish in contact with such liquids, and soon becomes soft. True amber pieces of small size may be formed into a lump of much greater value, by moistening the surfaces to be united with caustic potash, and pressing them together while warm.

A NOVEL RIDDANCE FOR RATS.—An inventive genius filled a small tarleton sack with a spoonful of cayenne pepper, and tacked it over the rat-hole. When the rat bounced out, his eyes were peppered by the sifting from the shaken sack. He squealed like a pig, and escaped. The whole tribe have since migrated.

EFFECT OF WATER PRESSURE.—The pressure of water on the main reservoir pips in Lansingburg, N. Y., was recently so great that it forced off the main valve, which weighed a ton, and threw it 50 ft. The water that followed rose 150 ft., struck the embankment of the Troy & Boston railroad, and washed away 25 ft.

CREMATION appears to be making rapid progress in Germany. During the year 1879 15 cremations were performed at Gotha. The Cremation Society of Milan has burned 48 bodies in the last three years.

HOW SNAKES MOVE.—Snakes creep; they have a series of muscular rings along the body, by the contraction of which, in rapid succession, they move over the ground. Watch the next one you come across.

FORCE of water in freezing is 30,000 lbs. pressure per square inch.

Good Health.

New Treatment for Cancer.

The London *Lancet* calls attention to an important series of investigations conducted at the Queen's hospital, Birmingham, as to a new method in the treatment of cancer, by Mr. John Clay, professor of midwifery at Queen's College. Hitherto this terrible disease has proved incurable by medical treatment; but the inquiries and experiments conducted by Mr. C. lead to the belief that by the use of Chian turpentine—which he has been the first to use—cancer can be not only arrested, but cured, without a surgical operation.

Mr. C's. paper was published in the *Lancet* of March 27th. He recommends his treatment especially in cases of cancer of the female generative organs. He says that he had made extended trial of various remedies, both general and local, but not last concluded that if cancer could be cured it must be by medicine administered internally, and must be of such a nature that it could be taken for a long time without affecting special functions or general nutrition. A study of the pathology of cancer led him to the opinion that a carbo-hydrate of some kind might prove beneficial, and for several reasons he decided that Chian turpentine might prove the most suitable. An opportunity was soon presented. A woman aged 52, came to the hospital with cirrhous cancer of the cervix and body of the uterus. "Hemorrhage was excessive, pain of the back and abdomen agonizing and cancerous cachexia well marked. The patient evidently had not long to live. In such a case it seemed justifiable to attempt to relieve the sufferings of the patient, even if the remedy should produce unfavorable symptoms, or should prove of no avail. I therefore prescribed Chian turpentine, six grains; flowers of sulphur, four grains; to be made into two pills, to be taken every four hours. No opiates were prescribed nor lotion taken. No change was to be made in her diet or occupation. On the fourth day after taking the medicine the patient reported herself greatly relieved from pain, and was in better spirits, but she complained of a large amount of discharge. It was feared that she referred to a discharge of a sanguineous nature. On examination, however, the vagina was found to be filled with a dirty-white secretion, so tenacious as to be capable of being pulled out rope-like, and this, although she had syringed herself three hours previously.' The medicine was continued for 12 weeks with excellent results and every appearance of a cure being probable. At the end of that time she suddenly left the town and left no address.

The second case was that of a younger woman, aged 31. In this instance the cancer appeared to be melted away by the turpentine in four or five weeks.

Mr. Clay reports several other cases in which remarkable benefit evidently resulted, with every prospect of permanent cure. Some cases have been cancer of the breast, abdomen, etc. In a case where the turpentine could not be digested in pills, it was made into an emulsion by Mr. Whinfield, dispenser to the hospital, as follows: An ethereal solution of Chian turpentine was prepared by dissolving 1 oz. of the turpentine in 2 oz. of pure sulphric ether, (anæsthetic). The ether dissolved the turpentine instantly. Of this solution, ½ oz.; solution of tragacanth, 4 oz.; syrup, 1 oz.; flowers of sulphur, 40 grains; of water to 16 oz.; 1 oz. three times daily.

Mr. Clay remarks that "ordinary oil of turpentine, if it produces any effect on cancer, is inadmissible on account of the speedy production of its specific effects, even when administered in small doses. The same remark applies with less force to the Venice and Strassburg turpentines; in my hands they have not produced the same beneficial effects on cancerous growths as the Chian turpentine has done. The maximum dose of the last named drug, which can be safely and continuously given, is 25 grains daily. It is advisable to discontinue the remedy for a few days after 10 or 12 weeks' constant administration, and then to resume it as before. The combination with sulphur was given at first, and has been continued. It is doubtful whether much benefit is derived from the combination, but the effects have been so uniformly good with it, that it was thought advisable to continue its use. There is every reason to believe, from the trials made with other substances in combination with the turpentine, such as carbonate of lime, iodide of calcium, ammoniated copper, quinine, bebeerine, hydrastin, etc., that the turpentine is best administered simply, as the most marked and rapid effects have always been manifested when it has been given alone.

"The turpentine appears to act upon the periphery of the growth with great vigor, causing the speedy disappearance of what is usually termed the cancerous infiltration, and thereby arresting the further development of the tumor. It produces equally efficient results on the whole mass, seemingly destroying its vitality, but more slowly. It appears to dissolve all the cancer cells, leaving the vessels to become subsequently atrophied, and the firmer structures to gradually gain a comparatively normal condition.

"It is a most efficient anodyne, causing an entire cessation of pain in a few days, and far more effectually than any sedative that I have ever given. In the cases I have described no sedative was employed in any instance, although in some cases where great pain had existed previously to commencing the treatment, large doses had been given. Whether this arrest of pain arises from the death of the tumor, or, as my son suggests, is due to there being no longer irritation of the sentient nerves (in consequence of tension being withdrawn by the removal of the cells), the fact is the same."

The "Chian" turpentine, above alluded to, is obtained from the *Pistacia Terebinthus*, a native of the small island of Scio, off the coast of Asia Minor. It occurs but rarely elsewhere, and the annual product of the tree is very limited. Hence this special turpentine is very rare, commands a high price, and is often adulterated with other turpentines. Chian turpentine is a thick tenacious liquid of a greenish yellow color, with a peculiarly penetrating, but quite agreeable odor. We understand that all the Chian turpentine in this market is just now in the hands of one party; but an additional and general supply will soon be received.

We further understand that the earnest attention of physicians in San Francisco and vicinity is already being turned to this supposed specific for a dreaded malady, and that treatments in one or two instances have been initiated with most favorable indications. We shall watch the progress of this same, and report results in these columns.

DIMPLES TO ORDER.—A New York paper heralds a manufacturer of dimples, who comes from Paris, of course, and whose *modus operandi* is described as follows: "I make a puncture in the skin at the point where the dimple is required that cannot be noticed when it has healed, and with a very delicate instrument I remove a slight portion of the muscle. Then I excite a slight inflammation, which attaches the skin to the subcutaneous hollow I have formed. In a few days the wound—if wound it can be called—has healed, and a charming dimple is the result."

SLEEPING IN STORES.—The *American Grocer* sensibly objects to persons sleeping in stores. The store may be clean and well kept, yet these things combine to make an impure atmosphere, which even a tolerable ventilation will not do away with; even a tolerable ventilation most country stores don't have. "We tested the matter for several years, and don't think our health was at all improved by the experiment."

HEALTH IN GREENHOUSES.—Dr. J. M. Anders in a paper in the *Medical Times* on the hygienic and therapeutic relations of house plants, asserts that plants are not injurious, but quite the contrary, and that persons accustomed to the moist air of greenhouses, are not, as a general rule, short-lived or consumptive.

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SAN FRANCISCO:
Saturday Morning, June 19, 1880

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The Week.

During the week the accustomed and agreeable summer temperature has prevailed in the city and throughout the State. There are reports of damage by the hot and dry north winds to the wheat in some sections; many luxuriant fields were shrivelled or dried up; and in Colusa county particularly the yield of wheat will be materially reduced. On the whole, however, the crop will be large.

Mining continues active, as our reports from every direction clearly show. The mining situation in this State has not been so cheering for years. Our exchanges report continued activity in Arizona. The difficulty with the miners at Leadville, Col., has been settled and quiet restored.

It will be seen from the list printed in another column that Congress, which adjourned on the 16th inst., passed liberal appropriations for California. At the same time it is to be noted that many bills of great private and public interest were laid over for the next session.

Prof. James B. Angell, U. S. Minister to China, has arrived in this city. Of course he will have an opportunity during his brief sojourn of seeing, in a nutshell as it were, the practical evils of Chinese immigration. Even one day passed in the Chinese quarter will disclose to an observant eye the pernicious tendencies of the Chinese system.

The condition of the mining share market and the shipments of bullion are detailed in the usual column.

RICHMOND CON.—The London *Mining Journal* May 22d, says: The usual telegram from the mine at Enreka, Nev., states that the week's run was $70,000 from 1,000 tons of ore. During the week the refinery produced dore bars to the value of $50,000.

THE North Bloomfield hydraulic mine, Nevada county, is making regular shipments, which go to Nevada City under armed guard. This mine yielded over $300,000 last year, but this year the weather was so bad that the yield will not be quite as heavy.

The Iron Industry of the Pacific Coast.

The highly important iron industry—almost the highest in a civilized community—has been singularly neglected on this coast. It has long been known that vast deposits of iron ores of various and superior quality exist in California, Oregon and in Utah and Washington Territories, yet the first blast furnace for manufacturing pig iron has not been completed in California. Oregon has exhibited more enterprise. In 1865 the Oregon Iron Co. was incorporated to carry on the business of smelting iron ore and manufacturing pig iron; and the company built its first blast furnace at Oswego, on the Willamette river, a few miles above Portland. The furnace was finished and the first pig iron produced in 1867; and the furnace continued in blast 410 days, during which time 2,395 tons of pig iron were manufactured. This first investment proved unprofitable, and the works were sold to the Oswego Iron Co., incorporated in 1868. The works were remodeled in 1878-9, and the new company went into blast April 23, 1879, and is still in blast. Up to January 1st, it had produced in 206 running days, 2,300 tons of pig iron, an average of over 11 tons per day. The company intends to increase its capacity of production to 18 tons daily. It owns fully 2,000 acres of land, which include the Prosser ore-bed with its inexhaustible supply. This ore is of the variety known as brown hematite, and averages 40% metallic iron. At the close of last year the company had mined 8,000 tons of ore, and had 7,000 cords of wood made into charcoal; this year it has contracted for the delivery of 12,000 tons of ore and 12,000 cords of wood to be made into charcoal, and expects to produce 5,000 tons of hot-blast charcoal pig iron.

These facts respecting the infancy of the Pacific coast iron industry were gleaned from the *Commercial* (Oregon) *Reporter*, and redound to the credit of Oregon enterprise. Interest in the great product has been awakened at last, and has assumed practical form in this State. Lately the Placer *Herald* gave an interesting statement of the immense deposits of iron ore which occur near Clipper Gap, in Placer county, only a few miles from the Central Pacific railroad. It appears that at different times and by different parties efforts were made to secure the erection of furnaces to work the ore and produce pig iron, but they invariably proved abortive. At last a gentleman named Fitzhugh, who possessed large experience as proprietor of smelting works at the East, acquired an interest in the deposits at Clipper Gap, and has since labored assiduously to organize a company of capitalists to utilize the ore, and manufacture the indispensable iron. Success at last crowned his persistent efforts, and a company has been organized consisting of Egbert Judson, Irving M. Scott, A. P. Hotaling, and P. Fitzhugh, the latter gentleman acting as Supt. The *Herald* says the company has begun the erection of furnaces, and all the other necessary works for the production of pig iron, and expects to be in blast before the close of the present year. Near the mine a small town has been laid out, and a number of small cottage houses for families have already been built, and a large two-story boarding house, with a capacity to accommodate 30 men, is now in course of erection. Bricks are being made on quite an extensive scale for the walls of their furnace works, and the construction of patent charcoal kilns, of which latter they will require a great many. A large force of masons and helpers is at work on the foundation for the furnace, and the foundation of the structure that is to contain the works, engines and machinery.

The blast furnace, in the course of erection, will have a capacity of 10,000 tons per annum. The company has bought a section of land, which includes the mine, besides about 6,000 acres of timber land on the Nevada county side of Bear river, from four to six miles distant from the mine. It is their intention at an early day to construct a railroad track from the C. P R. R. to their works, and then on into the region of their timber, the latter road to aid in obtaining their coal or fuel, and the former to facilitate the export of their product and the import of all needed supplies. The ore beds are vast, and wood for charcoal and limestone for flux are both convenient and superabundant.

This Clipper Gap enterprise may be regarded as a substantial beginning of the iron industry in California. Indeed, the project may assume, in the near future, proportions of great magnitude. It is an open secret that, in response to an application from the Japanese government for a loan of $20,000,000, to construct a navy of iron steamships, several gentlemen, including Messrs. John W. Mackey and Irving M. Scott, offered to take the loan; that is to say, they offered to build a certain number of vessels at a stipulated sum and deliver them to the government of Japan. The rumor further runs, that one of the gentlemen mentioned has already gone to Japan for the purpose of negotiating the loan in the manner indicated, and that if he shall be successful, he will go direct to Great Britain to inspect the great iron works and ship yards, and collect the best and latest data respecting the construction of iron vessels, and that on his return here the company will at once proceed to erect extensive and complete works for the manufacture of iron and the construction of iron steamships. It is stated that the parties own a large tract of land adjoining the present rolling mills, which they will devote to the purpose; and further, that the plant of the company, which will include a Bessemer converter, will be commensurate with its great capital. If this rumor should prove to be well founded, California may at a single bound take a place in the ranks of the iron manufacturers and iron ship builders, and use a part of her vast product of the precious metals to build up and foster the long-neglected industry. Iron ores occur superabundantly on the coast; wood is also abundant at many points; and if we shall be able to demonstrate that we can produce cheap as well as superior iron, what, it may be asked, is to hinder San Francisco from building iron steamers and ships for the trade of the Pacific, as the Clyde does now for the trade of the Atlantic?

Arizona.—No. 8.

Chief among the mines of Pioneer district is the Silver King, located in 1875. During the first nine months after its discovery it produced ore netting $90,000 and in 1876 it yielded $140,000, while for the first four months of 1877 it produced $127,691. Over 300 tons of ore averaging about $1,100 per ton have been shipped from the mine and the average value of the ore produced will not fall far from $100 per ton. The lower grades are concentrated and in that form shipped abroad. These concentrations range from $1,500 per ton upwards.

Other mines in the Pioneer district are Upper Crust, Silver Cross, Idlewild, Cedar Hill, Aztec, Glasgow, Montezuma, Baltimore, Ohio, 76, Athens, S. B. Farnham, Silver Belle, Silver Queen, Argo, Crown Point, Belcher, Surprise, Essex, Empire, Hartford and Wana Whats. A hatch of ten pounds weight from one of these mines yielded eight pounds of pure silver. Picket Post, called also Pinal, is a growing and thrifty town, 30 miles from Florence, and five from the Silver King mine.

East of the Pioneer district is the Globe, a region more than twenty miles square, the greater portion taken out of the White Mountain Indian Reservation. Among the principal mines are the celebrated and highly productive Stonewall Jackson, also the General Lee, Hannibal, Gleason, Henry Clay, Magnet, Champion, Miami, Chromo, Wheatfields, Irene, Buckeye, Dauuhe, Mexican and Excelsior. The ore of Stonewall Jackson mine is native silver and chloride silver, in a gangue of quartz and crystallized feldspar. The mines of the Globe district are said to be of the same character as those of the great producing mines of Mexico. Globe City in 1877 had five stores, two quartz mills, several saloons, and a population of about 300. About 20 miles from Globe City is McMillenville, containing about 200 people. It takes its name from the discoverer of the Stonewall Jackson mine which lies adjacent and which supports the business of the settlement.

In Randolf district, west of Pioneer district, are situated the Sky-blue and Hidden Treasure mines, and in its southern portion are some placer diggings. News from the Globe district, Feb. 7, 1880, is to the effect that a large body of ore, probably at least 68 feet wide, has been discovered at the Mexican. In the Richmond Basin, Globe district, are some first-class mines, among them the noted Mack Morris mine, which recently changed hands and is now being worked on quite an extensive scale. The veins here lie in a formation of gneiss and are remarkable for the richness of their ores, which are antimonial sulphurets. In this basin are also found "blanket ledges" or *Planchas la Plata*, and in the surface soil have been found great quantities of silver nuggets almost pure and much extremely rich float rock, which has generally been supposed to have come from the Richmond, Mack Morris and other rich deposits in places above.

Up to Jan., 1874, American mining capital in Arizona had never paid expenses. It was at this date that some of the mines in northern and central Arizona were discovered, among them the Stonewall Jackson, which was sold for $120,000. No sooner had it been sold than the owner heard that those who bought would have given $250,000 rather than not obtain it.

The climate of this mining region is good, work involving no loss of strength or appetite, and the country around is adapted to agriculture, so that milk, butter, melons, vegetables and fresh meat are readily obtainable at Globe City.

Mohave.

Mohave county occupies the northwestern angle of the Territory, north of Yuma and west of Yavapai. It contains no large town, but has several flourishing settlements and a considerable number of mines. Mineral Park, the county seat, in the Hualpai district, is a bustling little place, and at Cerbat, seven miles south, some milling is done. Aubrey, situated at the junction of the Colorado with the Bill Williams Fork, had a population of about 200 in 1877, and Hardyville, 70 miles north of Aubrey, also on the Colorado, was of about the same size. Aubrey is about 60 miles from Ehrenberg, Yuma county.

The Hope, Aubrey and Owen's mining districts occupy a large area north of the Bill Williams Fork. Here is the Omega mine, and northeast of Aubrey, about 45 miles distant by the road, are the McCracken, Senator and Signal mines. About 10 miles east of these mines, within a short distance of each other, are located the three settlements of Signal City, New Virginia and Greenwood. A short distance northeast of these towns is the Greenwood district, in the Aquarius mountains, 17 miles square, containing the Burro and Centennial mines. West of the Greenwood district, and northwest of the McCracken mine, is Cedar Valley district, of slightly larger size, and containing the Arnold mins, on a ledge several miles in length. Around the McCracken there is plenty of mesquit, ironwood and cottonwood; while water is supplied to the mills at Signal City and New Virginia by the Big Sandy branch of Bill Williams Fork.

The poorest ores of the McCracken run about $55 per ton, which is $10 more than the Comstock. The ore body is 45 ft. wide. Virginia City and Signal claimed a population of 600 to 700 in 1878. The Maynard district, in Hualapai valley, contains the famous Hackberry mine, about 55 miles north of Signal City. The assays of the ore vary from $100 to $3,000 per ton. Much of it is free milling. Wood and water, grass and game, are abundant in this district.

The Hualapai district, 34 miles in length by an average width of 15, contains several well-known mines, the business of which centers at Mineral Park and Cerbat. Among these mines are the Index, La Porte, Oro Plata, New Year, Metallic, Accident, Lone Star, Keystone, etc.

Apache.

Apache, a large county of some 23,500 square miles, occupies the greater portion of the eastern part of Arizona, having a length from north to south of about 280 miles, and a breadth of 96 miles throughout the greater part of its length. At its northeastern angle a large reserve is set apart for the Navajo Indians, and a large portion of the Apache reservation is included in its southern portion. West of the southern extremity of the Navajo reservation are the fortresses towns of the Moquis, a small remnant of the town-building Indians who held the country before the days of the wild Apache.

But little mining has yet been done in this part of Arizona, the only district marked upon the latest map, that of Eckhoff and Riecker, 1880, being Clifton. Here are the famous Longfellow copper mines. A letter from Clifton, dated Jan. 20, 1880, states that a more thorough prospect of the district shows that gold and silver abound here as well as copper. Silver appears to predominate, but portions of gold rock have been taken out. The amount of copper here is enormous. The Longfellow mine is not a vein, but an open quarry, copper extending in every direction. The Coronado mines, three miles to the west, are on a vein from 30 to 135 ft. wide, and show for a great distance. The copper is sent to Baltimore, and costs only five cents per pound to mine and smelt, and six cents for transportation by mail routes and railroad from Colorado.

Although only the greater part of the Apache reservation is in Apache Co., the agency and sub-agency are both on the south side of the river. The Chiricahua Apaches are said to be working hard under difficulties caused by a lack of utensils, etc., at irrigating and cultivating their fields. They have many sheep and cattle. Eskiminziu, their head chief, has 200 sheep and 60 cattle. If it were not for the sake of his people, the chief would take up land like a white. Polygamy is practiced, but is becoming rarer through white influence.

The Apache, whose name even now recalls images of rapine and murder, and who now is giving trouble to Uncle Sam's troops, who have to follow Victorio's band in and out of Sonora, Mexico and Arizona, is of medium size, physically quick and active, and capable of enduring great hardships. He is shrewd, can talk well, is witty and jocular, and exceedingly quick of movement. Cochise was the greatest warrior chief the Apaches ever had, and was never beaten in battle. After fighting the whites all his life, in 1875 he died a natural death. During the last three years of his life he lived at peace with the people of Arizona, but carried on a relentless war with the Mexicans. The Apaches on the reservation are kept in order by policemen appointed from among themselves, and these do their duty well and faithfully.

There are very few settlements in this county, the principal being those dignified with the names of Sunset and Snowflake "cities;" St. Joseph and St. John, all in the valley of the Little Colorado, which is fast settling up, and becoming important as a grain and grazing country. Heavy snow falls in winter, and, as in the rest of Arizona, rain falls in summer.

DEATH OF CONRAD WIEGAND.—The sad news comes from Virginia City of the death of Conrad Wisgand by his own hand. The death of his only daughter about three years ago, gave him a shock from which he never recovered; and that event coupled with reverses in business, so impaired his health and unhinged his mind, that at last he sought refuge from his woes in death. Mr. Wiegand was a native of Pennsylvania. He came to this city at an early period, and for several years held the responsible position of chief assayer of the U. S. mint. He then removed to Virginia City, where he established and carried on an assay office up to the day of his death. He was intelligent and versatile and a facile writer, and during his long residence on this coast was conspicuous for his ardor in the promotion of mining and scientific progress. Although somewhat eccentric, he possessed sterling qualities. He was sensitively honest, faithful in all his relations, and generous to a fault.

Devices for Grasshopper Killing.

There is danger that the grasshoppers from the mountain valleys may extend their ravages into the larger agricultural regions of the State, and means for destroying the insects are of general interest. We show some of the means for destroying the insects as laid down in the report of the Rocky Mountain locust commission. There are innumerable mechanical contrivances for this purpose. The cheapest and most satisfactory are those intended to hag the insects. A frame two feet high and of varying length, according as it is to be drawn by men or horses, with a bag of sheeting tapering behind and ending in a small bag or tube, say one foot in diameter and two or three feet long, with a fine wire door at the end to admit the light and permit the dumping of the insects, will do admirable work. The insects gravitate toward the wire screen, and when the secondary bag is full they may be emptied into a pit dug for the purpose. These hagging machines will prove most serviceable when grain is too high for the kerosene pans, just described, and they will be rendered more effectual by having runners at distances of about every two feet, extending a foot or so in front of the mouth, so as to more thoroughly disturb the insects, and prevent them from getting underneath; also by having wings of vertical teeth, so as to increase the scope with as little resistance to the wind as possible.

Two important facts should always be borne in mind in using these hagging machines: 1st, that they should always be drawn, as far as possible, against the wind, if this be stirring; 2d, that in proportion as the insects and the grain are advanced in growth, and the former become predisposed to roost, in that proportion the machines will prove more serviceable at night.

Prof. C. V. Riley, chief of the commission, constructed a machine embodying the features already mentioned, and it answered the purpose very well indeed.

It is not patented, nor does the Prof. intend to patent it, unless it should be found necessary to prevent others from doing so. The machine operates upon the hagging principle. It is, briefly, a large canvas bag stretched upon a light but strong frame, and placed upon runners, which extend with curved tips a little in front of the mouth. The canvas is stretched upon the inside of the frame, thus making the bag smooth and even within. This bag has a mouth, *A*, 10 ft. long and 2 ft. high, and converges backward to a small box or frame, 1 ft. square, with a slide cut-off, *D*. This box forms the mouth to a secondary bag, *B*, 2½ ft. long and 1 ft. in diameter, which ends in a second frame having two short runners below it. There is a sliding door, *E*, of wire gauze in the end frame, and the secondary bag is strengthened by a couple of strips of leather connecting the two small frames. The machine is made to "take more land" by means of two right-angled triangular wings, *C*, about 6 ft long, that hinge to the upright ends of the large frame, in such a manner that the rectangle joins the upper corner of the frame. From the lower side of this wing are suspended a number of teeth, or beaters, which swinging loosely, drive the locusts inward. The machine is handled by means of two ropes hitched to the outer runners, or to the outer and lower side of the mouth of the frame.

On smooth ground the machine can be easily hauled by two men, but where the grass is tall and thick it pulls harder. The locusts, on hopping into the machine, soon reach the small back portion, enter the small bag, and are attracted to the rear end by the light which enters by the gauze door. When a sufficient number are thus captured the machine is stopped, the cut-off is slid down in front of the secondary bag, a hole is dug behind the machine, the bag tipped into it, and the insects buried. A strip of leather closes a slit through which the cut-off slips, and the main bag is made of dark cloth, while the secondary bag is white, so as by contrast to attract more thoroughly the locusts.

The advantages of this machine are that it requires no additional expense to run it, as for oil, tar, etc. It will catch the winged locust as well as the young, if operated on cool morninge and eveninge, and is adapted to almost all conditions of growing grain. The machine can be made for about $10, and perhaps less. In practice Prof. Riley found it best to draw the machine by hitching to the runners, and to brace the winge at desired angles, according to the strength of the wind, by means of two iron rods, as in the illustration.

In order to show how mechanism can be arranged for crushing locusts, and thus destroying them as fast as they are gathered in, we give an engraving of what is called the Flory locust machine, patented by a man of that name in Colorado.

The main feature of this invention is a revolving platform of heavy canvas or wire cloth, which runs between two horizontal rollers. Long arms reach forward, which support a revolving reel; from these arms downward extend sheet-iron sides, over the top a canvas covering; all so constructed as to form a large, wide mouth, into which the hoppers are driven by the arms of the revolving reel and carried between the two rollers and crushed. Horizontal strips running along the rollers serve to keep the rollers and platform clear of the crushed grasshoppers. The whole machine is supported on two main wheels about the middle, and two smaller ones in front. Extending back is a frame or cross-bar, to which one or two horses may be hitched to push the machine forward, or it may be operated by hand. The front of

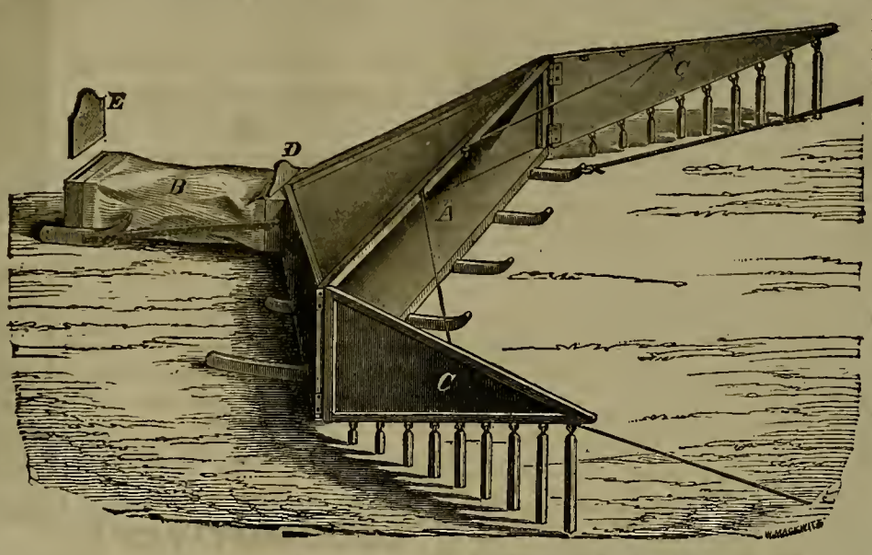

FIG. 1. LOCUST CATCHER, INVENTED BY PROF. C. V. RILEY, ENTOMOLOGIST.

the platform runs close to the ground, and by bearing down at the rear by the driver, it can easily be lifted over any obstruction that may be in the way. The machine can be raised or lowered in front to suit the crop over which it is run. This invention will destroy the grasshoppers without the necessity and expense of using oil or tar. The machine is so simple in construction that any ordinary workman can

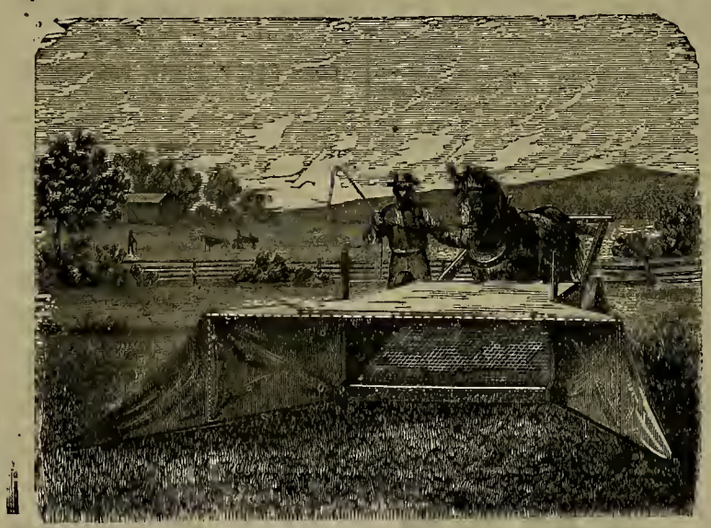

FIG. 2. FLORY'S LOCUST CRUSHING MACHINE.

put them up at a comparatively small price. The machine may be made of any size desired, from a small hand machine to a rod or more in width.

Fig. 2 represents a front view of this machine when in operation, and Fig. 3 a side view of the frame, of which the following is a description: The rollers, *B* and C^1, are 8 ft. between the side pieces. The roller, *B*, forming the axle, is

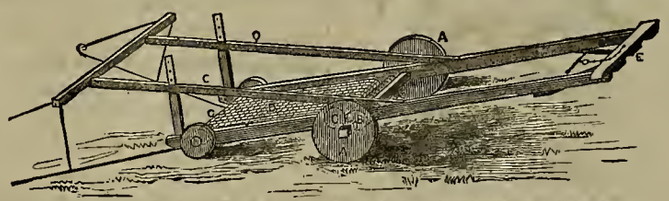

FIG. 3. DETAIL PLAN OF FRAME OF FLORY'S MACHINE.

about 16 inches longer than the other. The wheels are 24 inches in diameter, 4 inches thick, made of pieces of 2-inch lumber. Front roller, *C*, 8 ft. between side pieces, 4 inches in diameter. Front wheels 10 inches in diameter, so set as to let the front roller and platform run within a few inches of the ground. Front wheels should be on movable axles, so as to raise or lower the machine. The platform is made of heavy ducking, endless, and revolves between the two rollers, *B* and C^1. A bead block and key at each end is used to drive the roller, C^1, up tight against the axle, *B*. Side pieces are made of scantling 2 by 6, 7 ft. in front, 9 ft. in rear of axle. Arms, *G*, *G*, 2 by 2, so arranged as to raise or lower the cover, *P*. Cross piece in front of roller, *C*, (Fig. 3), set so close as to serve as a cleaner to the platform, also protects the platform from rocks, etc. A short apron is attached to this piece, extending to the ground. (If necessary, a cleaner-strip may be placed immediately under roller, C^1 (Fig. 3).) *W* are canvas wings, extending forward and ontward at an angle for the purpose of driving the grasshoppers in from either side; and as the machine advances, they jump on to the movable platform and are carried into the rollers, *B* and C^1 (Fig. 3), and crushed. *X*, *X*, are iron rods hanging by ropes from the end of front cross piece, *T*. *V*, *V*, are wires extending from end of iron rods to cross piece, *T*. To the iron rods and wire the canvas sides are sewed. An apron of canvas hangs from the iron rods, *X*, *X*, to sweep the ground. Over the top to the pieces, *C*, *C*, a canvas cover is placed, tacked on, extending back to the cross piece, *F*. The sides are also closed up with canvas.

We have given these designs in case any of our readers should come face to face with the grasshopper scourge, and desire to fight for the safety of comparatively small areas. Doubtless our ingenious readers can use the designs as suggestive for home-made machines, and perhaps improve upon the arrangements we have shown.

NEVADA REUNION.—The ex-residents of Nevada Co. will hold a reunion at Shell Mound Park on Saturday, June 26th. Blum's band will furnish the music, and then there will be dining, speaking, singing, poems, etc., to enliven and make pleasant the day.

SEVEN Puget Sound sawmills resumed operations, June 10th.

Collection of Mineral Specimens.

It is much to be regretted that steps were not taken by the State years ago to form a collection of mineral specimens. Collections of minerals are easily made, as from their nature they require no previous preparation, like most zoological specimens, and do not require careful handling. It was California's great mineral wealth that drew its population from all quarters of the world, and it is not to the credit of the State that, after over thirty years of mining, no creditable exhibit of ores and minerals exists within its boundaries. Had such a collection been commenced under the auspices of the State government any time between the years 1850 and 1860, we would now undoubtedly possess the finest collection of minerals in the world. There is no difficulty in gathering material for a collection of this kind. If a proper and permanent place be prepared for its reception and exhibitions, contributions would pour in from all parts of the State and the Pacific coast. It has always proved to be the case that collections of this kind grow as rapidly as room can be made for them.

The Australian Commissioner to the Centennial Exposition at Philadelphia brought with him a large and valuable collection of minerals from Australia and New Zealand to present to the State of California, but found on arriving here no place for it, and had to divide it up. A good portion of the collection now enriches the museum of the State University at Berkeley. In every town and village in the mining counties are private collections, many of them containing hundreds and some thousands of specimens. Many possessing duplicates would willingly contribute them to a State collection, and there are several no doubt who would give their entire collections if certain that they would be placed on permanent exhibition. The value of a collection of this kind to the State cannot be estimated, but it would be very great.

Owing to the indestructibility of mineral specimens, it is not yet too late to make a valuable collection. The last Legislature, realizing the necessity of such an exhibit, created the office of State Mineralogist, a part of whose duty it will be to obtain material for a State collection and take charge of it. Now that a permanent place is to be provided for the reception of specimens, if contributions from the private cabinets from all the mining counties, from new and old mines, be made now, more will rapidly follow, and a creditable exhibition of California's mineral resources will soon be made. We hope to hear in the near future of the legislatures of all of the States and Territories in the mineral-producing regions of the Union following the commendable but tardy action of that of California in this matter. It is a false and narrow-minded idea of economy that neglects such legislation.

THE CALIFORNIAN.—The bound volume which contains the first six issues of the new magazine, the *Californian*, brings indisputable evidence of the quality and style of the publication. It is worthy of the Pacific coast and should be liberally supported. The fact that the coming volume will appear in new dress is in itself an indication that popular interest is being secured. The *Californian* is credited with being edited with ability, and the group of contributors is a capable one. The magazine is characteristic of this coast. It has local ideas and glimpses at local scenes, both in nature and the associations of our people. Thus the publication has the freshness of the Pacific coast country upon its pages, and cannot but be agreeable to those who love the scenes and conditions in which they live and act. This freshness of its environment is reflected from the fabric of true culture and polite literature which occupy its pages. The *Californian* has lived long enough already to show that it is worthy to be loved at home and admired abroad, and this reception, we believe, awaits its coming issues.

MINERAL LAND BILL.—A bill for the survey and disposal of mineral land, framed and sent to Congress by the Public Land Commission, was reported to the House, June 10th, from the committee on mines and mining. The Pacific coast members do not favor the bill, and say that the bill agreed upon by them and reported from the same committee two months ago, has precedence on the calendar, and will be passed if any action at all be taken by Congress concerning mineral lands. The measure referred to, which was agreed upon by all the Representatives of the mining States and Territories, prescribes a general system of square locations, with the very important exception of all lodes which have a dip of more than 25° from the horizon, and also allows and protects locations of "prospectors' claims" (namely, where there are no surface indications) by giving citizens the right to hold a blind ledge by doing $200 worth of work upon it per annum.

IT IS stated that an offer of $700,000 was recently made for the Providence quartz mining property on Deer creek, Grass Valley, and was refused.

Foreign Coal Statistics.

An official statistical abstract has been published for the principal and other foreign countries in each year from 1866 to 1878, as far as the particulars can be stated, and this document contains a great deal of useful information. The statistics first give the principal articles imported into Russia, and show that of late years the importation of coal and coke into Russia has materially increased. In 1866 the amount of these imports was 39,683,000 poods, while in 1877 the amount was 90,367,000 poods. The valne of these imports was, in 1866, 1,984,000 silver rouhles, and in 1877, 12,989,000 silver rouhles. The figures show with sufficient clearness that during the last 12 or 13 years there has heen an important development in the import coal trade of Russia—a development, moreover, which appeare to have heen remarkahly steady and continuous. The next country to which the statistics refer is Norway, the imports of coals, cinders, and coke into that country being given with some particularity. In 1866 the amount of these imports was 1,739,000 tonder; in 1877 the amount was 4,110,000 tonder; and in 1878, 3,869,000 tonder. Here again an important augmentation is noted. Norway has recently required a much larger quantity of coals, although in 1878 there was a slight falling off as compared with the previous year. In 1878 there was also a diminution in the imports of iron wares into Norway. The imports of coal, cinders and coke into Sweden have greatly increased during the past few years. The total of these imports in 1866 was 17,487,000 cuhic ft.; iu 1877 the total was no less than 39,572,000 cuhic ft. These figures show, as will be perceivcd, that the imports of coal, etc., into Sweden, have more than douhled during the past decade, a fact which is certainly of some significance. The exports of ore, iron and copper from Sweden, show a slight falling off during the past few years, the amount in 1877 having been 298,000 centner, as against 648,000 in 1875. With regard to the imports of coal into Denmark, the official returns show that in 1867 the total was 2,873,000 tonder, and in 1877 4,783,000 tonder, another very material augmentation. The imports of iron and steel wares into Denmark have likewise much increased; hut with regard to the exports from that country, the statistics do not afford any information of interest to our readers. The quantity of coal imported into the German Empire in 1872 was 45,356,000 centners, and in 1878, 38,617,000 centners, thus showing an important decrease. The value of these imports was in 1872, 54,300,000 marks, and in 1878, 27,000,000 marke. On the other hand, the exports of coal from the German Empire have much increased during the last few years, the amount having heen in 1872, 76,395,000 centners, and in 1878, 116,506,000 centners. As showing the recent course of the German coal trade, these figures are certainly of great interest. The imports of coal into Holland have considerahly increased of late years; in 1866 they amounted to 1,579,000 tonnen, and in 1877, 2,425,000 tonnen. The value of these imports was, in 1866, 15,793,000 gulden, in 1878 the value had increased to 24,251,000 gulden. The exports of pig-iron from Holland have much increased; they amounted to 5,068,000 gulden in 1866, and to 21,119,000 gulden in 1877. The exports of coal from Belgium during recent years have not shown any specially remarkahle fluctuations. In 1866 the amonnt of these exports was 3,972,000 tonneaux, valued at 65,548,000 fr.; in 1878 the total was 3,889,000 tonneaux, valued at 53,396,000 fr. The exports of coke from Belgium amounted to 548,000 tonneaux in 1866, and to 576,000 in 1878. The imports of coal into France have not varied in amount to any great extent of late years. In 1866 the total of these imports was 7,408,000 tonneaux, and in 1878, 7,751,000 tonneaux; in 1866 these imports were valued at 146,500,000 fr., and in 1878, 143,100,000 fr. The imports of coal into Switzerland amounted to 346,000 zugthier lasten in 1866, and in 1878 to 649,000 zugthier lasten—a noticeahle increase. The importe of coal into Italy have also increased during the past few years. In 1866 these imports reached the total 524,042 tons, and in 1878 1,325,000 tons. In 1866 the imports of coal into the Austro-Hungarian Empire amounted to 5,737,000 centners, and in 1876 the total was 15,746,000 centners. The exports of coal from the Austro-Hungarian Empire amounted to 9,621,000 centnere in 1866, and to 27,348,000 in 1876. As will he perceived, these figures show a considerahle augmentation.—*British Mail.*

The Richmond Mine.

The London *Mining Journal* contains the report of the Directors of the Richmond Con. M. Co. (limited) at Eureka, Nev., for last year, from which we present the following interesting exhibit:

The mining profit for the year is $715,316.50, and the net profit is $672,558.75, or as nearly as possihle 50% of the total capital of the company. Out of this sum of $672,558.75, and a balance of $97,596, brought forward from last year's account, the Directors bave paid three dividends of seven shillings and sixpence each, amounting together to $303,750, and $7,022.50 legal expenses, at Eureka, in connection with the defense of the mine, leaving a halance to the oredit revenue account of $459,282. During the year 43,312 tons of ore has been smelted hy the two large furnaces; of which 34,371 tons were raised from the Richmond mine and 8,941 tons purchased, yielding (with 299 tons of fine dust and debris removed from the foundations of the old furnaces) 26,152 ounces of gold, 942,294 ounces of silver, and 8,172 tons of lead. In addition, furnace No. 4, which is working in connection with the refinery, has reduced (with the drosses from the refinery) 4,680 tone of low grade Richmond ore, and 4,228 tons of purchased ore, yielding 4,863 ounces of gold, 166,630 ounces of silver and 1,264 tons of lead. The total production for the year from all the furoaces is consequently 31,015 ouncee of gold, 1,108,921 ounces of silver and 9,436 tons of lead.

The huildings, furnaces, refinery, steam-engines, hoisting apparatus, and machinery of every description, have heen thoroughly maintained, $63,510.50 having heen expended on repairs and renewals during the year.

A large amount of exploratory work has heen done during the year, and the mine never looked hetter than it does at present; nor have there at any time before heen such large bodies of ore opened up; 10,816 ft. of drifts have heen rnn, 1,086 ft. of winzes, and 1,748 ft. of raises, making a total of 19,650 ft., or more than 2¼ miles. The cost of labor alone, in dead work, has heen $80,858.50. No. 13 chamher has heen developed on the 600 level, No. 14 on the 500, and No. 15 on the 400 level. This last chamher now shows the largest body of ore ever discovered in the mine. Connections, all the way in ore, have heen made from this chamher to the northward with No. 13 chamher, a distance of 380 ft., and with No. 14, also to the northward, a distauce of 500 feet, and to the eastward with No. 11, a distance of 180 ft. Ore has recently heen struck on the 200 main drift, and the indications are that it will open out to a large ore body and connect with the other chambers. Good ore has also been struck in a crosscut from the 200 main drift. A raise has heen started in the hack of the drift which connects chambers 11 and 15, and is up a total distance of 118 ft., in high-grade ore. The course of this raise corresponds with the ore found in the 200 level. All the chambers are looking well, and yielding large quantities. The grade of the ore ie improving, the average yield in March having been $56.37, and in April $67.50 per ton.

IRON SHIP BUILDING IN CHINA.—A significant sign of the times is the progress which iron shipbuilding is making in China. A Scotcb firm who hegan hy estahlishing ship repairing yards at Shangbai, several years ago, now employ 1,100 Chinese workmen.

MICA.—A deposit of mica has been discovered about three miles south of Skull valley, Arizona, which promises to be valuahle. At a depth of seven ft., sheets of clear mica, four inches square, are heing taken out, and the vein is increasing in size as depth is attained.

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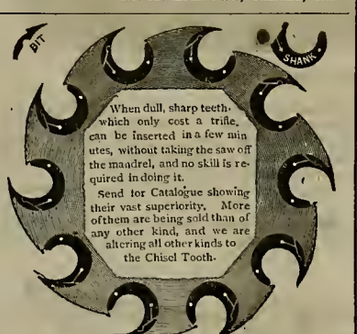
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GEORGE SPAULDING,
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DWIGHT GERMAIN.
State of California, } ss.
City and Co. of San Francisco, }
On this twenty-seventh day of May, A. D. 1880, before me, Sam'l S. Murfey, a Notary Public, in and for the said City and County, residing therein, duly commissioned and sworn, personally appeared George Spaulding, J. Munroe Miller and Dwight Germain, known to me to be the persons described in and who executed and whose names are subscribed to the within and annexed instrument, and they each acknowledged to me that they executed the same.
In witness whereof, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written. SAM'L S. MURFEY, Notary Public.
"Endorsed"—Filed, May 27, 1880.
WILLIAM A. STUART, Clerk.
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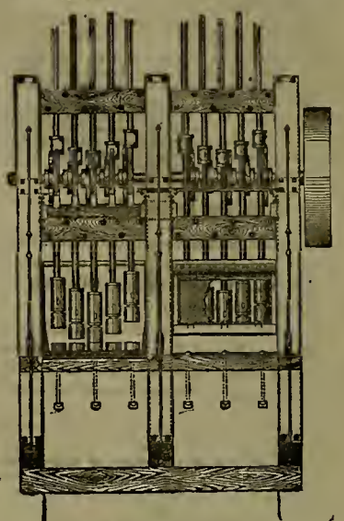

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

The following Canadian patents have been issued to residents of the Pacific Coast:

10,869.—REAPER AND MOWER—D. B. Camphell, Palisade, Nevada. Jan. 22.

10,937.—SICKLE BAR FOR HARVESTERS—W. R. Whittington, Middleton, Cal., and W. S. Neale, Lakeport, Cal. Feb. 18.

10,947.—FURNACE—A. C. Tichenor, S. F. Feb. 21.

10,977.—CREAM COLLECTOR—P. G. Peltret, S. F. Mar. 1.

11,009.—MEASURING FAUCET—W. M. Sack, Oakland, Cal. Mar. 8.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

PNEUMATIC ANNUNCIATOR.—David and Theodore Morris, Market St., S. F. This device consists in attaching to the main compression cylinder a peculiarly operated check-bell or tell-tale, which is intended to indicate any leakage in the line of pipe, and consequent failure of the signal bells to sound. This check-bell is used in combination with the gong or bell-ringing cylinders in such a manner that it will ring when their bells ring, but will not do so when they fail to do so. Peculiarly operating valves in the pistons of the bell-ringing cylinders control the action of the tell-tale bell in such a manner that when these pistons fail to move properly, so as to ring the bells and actuate the valve, the tell-tale bell will not ring, nor will it when there is any leakage in the line of pipe.

AUTOMATIC CUT-OFF AND GOVERNOR.—C. V. B. Downing, 320 Sansome St., S. F. Patented May 25, 1880. No. 227,967. This invention relates to certain improvements in controlling the quantity of steam which is admitted to the cylinders of steam-engines, and it may also be applied to any engine which is driven by a vapor, gas or fluid under pressure. It consists in varying the size of the openings by which steam is admitted into the cylinder by means of a novel mechanism, which is so connected with the engine shaft, that the opening made by the valve in passing over the port is altered by the increase or decrease of the load upon the shaft, thus forming a cut-off and governing device, which is adjusted by the increase or decrease of the work.

BALING PRESS.—John Cook, Healdsburg, Sonoma Co., Cal. Patented June 8, 1880. No. 228,515. This press consists in the employment of a horizontal box having a follower operated by a peculiar windlass or capstan and ropes and pulley, which are placed along the sides of the box; and it also consists in a novel method of bolding and tightening the haling ropes while the follower is moving up, so that they are all ready to be tied when the bale is pressed. A lever is fitted to the press by which the bale may be ejected as soon as finished. This press is economically built and operated, and material is easily introduced, and bales removed without supplemental doors or severe labor.

MAGAZINE FIREARM.—A. Schneider, 24 Erie St., S. F. Patented June 8, 1880. No. 228,560. This invention relates to certain improvements in breech-loading magazine firearms, and it is especially adapted to be used in cases where the magazine extends beneath and parallel with the barrel of the arm. And it consists in a vertically-moving breech-block in combination with an operating lever, provided with means for giving the block an intermittent movement, whereby the breech-block is made to cause when opposite the barrel while the cartridge is forced home, the operating lever moving continuously.

PNEUMATIC RAILROAD SIGNAL.—D. and T. Morris, 1045 Market St. S. F. Patented June 8, 1880. No. 228,550. This device relates to the construction of the mechanical connections by which an air-compressor for supplying air for operating a semaphore signal is automatically operated by a passing train, and it consists in the peculiar construction of the mechanism operated directly by the train and connected to the piston of the compressor.

VALVE-MOTION AND CUT-OFF. — EUGENE O'Neill, S. F. Patented May 25, 1880. No. 227,918. This device relates to a novel mechanism for opening and closing the ingress and egress ports in an engine, and the combination of such mechanisms with a governor, so that the movements of the engine will regulate the amount of steam admitted to the cylinder by the direct action of the governor upon the mechanism. The governor may be of any of the well-known or suitable forms.

TURBINE WATER WHEEL.—Wm. Hecheney, S. F. The wheel is made in a frame so as to be easily portable, and is intended particularly for running with a small head of water, so as to utilize all the supply without waste of power. It has peculiarly-operating gates for controlling the admission of the water to the scrolls, and in a peculiar construction of the step or bearing for the reduction of wear.

HORSESHOE TOE-WEIGHT.—Wm. H. Hulings, Menlo Park, San Mateo Co., Cal. Patented June 8, 1880. No. 228,533. The shoe has a weight attached by means of a dovetailed shenk, fitting in a correspondingly shaped slot in the shoe and secured by a screw. When this weight is removed the shoe becomes a plain, ordinary shoe, with no projection or addition to interfere with the horse's action.

The Julian Mine.

This mine lies about one mile south of Newcastle on the line of the C. P. R. R. in Placer Co. The locations cover 2,500 ft. on a north and south ledge which pitches 85° to the east. The first work was done on the ledge in 1862 or '63. Some months since it was sold by A. H. Snabel to the Julian Gold Mining Co. The thickness of the vein is quite uniform, averaging about 30 inches between smooth grenite walls. It has been opened and prospected through several shafts and adits, now abandoned with the exception of the main shaft which has been run down on the ledge to the depth of 580 ft. Lateral drifts run north and south from the shaft at the 130, 230, 300, 400 and 500-ft. levels. All of the ground above the 400-ft. level bas practically been worked out and at present the ore is taken from the 500-ft. stopes. In the upper levels chutes of rich ore were found in the south drifts, but the lower levels have not as yet run into them. In the 500-ft. north drift chutes carrying a small per cent of galena have been cut through. The entire vein is stoped out and milled, for although the ore is low grade, it is very uniform in quality. No timbering except to furnish support for the men working in the stope is required, and except in the shaft and drifts no waste rock is taken out. The water in the mine is pumped from the 400-ft. level and is easily handled, about 30,000 gallons being raised daily. The ore is very easily milled, 20 stamps crush 50 tons of ore daily. The yield at present is about $4 per ton in free gold and 2% of concentrations worth $70 per ton. Four Frue helts are used for concentrating the battery sands and give perfect satisfaction, the tailings not assaying, except where galena is present in the ore, over 50 cts. a ton. The ore at present being milled is not as rich as that taken from the upper levels, but the ore at greater depths is of better quality. The hoisting and pumping engines are run by steam and the mill by water power. The number of men employed is 40, 30 of whom are miners. Mr. P. C. Du Bois is the superintendent.

The Julian is one of the mines of California which has a future. Its facilities for extracting and milling the ore are of the best description, and the quantity of ore very great. The sale and subsequent energetic development of the mine has attracted considerable attention and capital to the quartz mines in the vicinity, and a number of properties that have lain idle for years are being opened again and prospected with very encouraging results.

New Mining Districts.

We not unfrequently notice the names of newly established mining districts in our country exchanges. While many are in papers published in well-known mining counties, others are in journals from localities that cause us to give them more than a passing thought. By reading of these new districts we learn that the mining area of California is gradually extending year by year, and now embraces counties considered a few years ago unworthy the attention of the prospector. We learn that important mining discoveries have been made in the mountainous sections of counties hitherto considered wholly agricultural, and some of them promise in the near future to develop into important mining centers. The Sierras of southern California have been generally looked upon as anything but a land of promise to the miner, and were left for years to the flocks of the stock raisers of the "cow counties" for summer pasturage.

But gradually and unheralded, little parties of prospectors, the mining pioneers, made their way into these mountains and opened the sealed book. When word of their discoveries was first given to the public, others followed in their wake, and soon ledges were discovered, claims located and incorporated, and mining districts formed. Few of the lodes have been extensively developed yet, but assays of gold and silver have been obtained that warrant the outlay being made by some companies in preparations to work their mines. In some of the new districts arastras and small stamp mills have been erected, and ore worked with good results.

Thus we see our mining country increasing, instead of diminishing, in extent, and the good showing of these new districts, and the immense area of country yet unprospected, lead to the belief that California's mining history is only in its first chapter.

Railroads in Northern Mexico.

The people of Mexico have long opposed every attempt to introduce the railway into their country, believing that its introduction would be followed by an extensive immigration from the United States, and that American occupation would eventually result in annexation. For the same reason they have resisted the innovation of American ideas and capital in the development of their mining and other resources, and by their exclusiveness have greatly retarded commercial intercourse between the two countries.

Lower California and a large portion of the mainland of northwestern Mexico is almost wholly mountainous and has long been famous for its mineral wealth. Rich silver mines have been worked there for centuries and still employ the same primitive methods of the times of the *conquistadores*, when the ore was carried out in large bags of rawhide on the necks of *peons* and broken up by hand before being reduced. The only means for transporting freight being on the backs of mules over rough mountain trails, it is not surprising that no improvement has been made in the manner of working mines and reducing ores.

Two or three railroads from the Pacific States and Territories into Mexico are projected and the line of one—the "Arizona and Mexico"—has been laid out. The completion of these roads or any one of them will be the dawn of a new era for Mexico. The increased facilities for transportation would give an impetus to mining enterprise, and reinforced by American experience, eagacity, capital and improved machinery, her annual product of gold and silver would soon surpass anything chronicled in her history. The railroad would open up undeveloped mineral-territory, of which there is still a large extent in Mexico, and facilitate the development of mines in American territory through which it would pass. The route of the Arizona and Mexican railroad is located for a distance along the base of mountains upon which many of the principal mines of Arizona are situated, including the Tough Nut, Contention, Empire, Grand Central, Head Center, Tranquility, Sulphuret, Cincinnati, Girard, Lucky Cuss, Maimie, Owl's Nest, Minerva, Sultana, Bell, Randolph, Junetta, Sunset, True Blue, Gordon and others, so that each can dump their ores into cars on the track by the use of tramways, and have it taken direct to the platforms of the mills along the San Pedro river. An arrangement of this kind, enabling ore to be shipped from the mines at comparatively slight expense to mills situated in convenient localities, is what is needed in the wild inaccessible Mexican Cordilleras.

California Appropriations Passed.

At the session of Congress which closed June 16th, California was fairly successful in the matter of appropriations, although many bills of public and private interests failed to go through. Notable among the items in the appropriation bills are the following: Senator Farley's amendment to the River and Harbor bill, providing for a survey and calling for a report on the debris question; the increased appropriation for the Mare Island dock, which was urged and obtained by Senator Farley and Representative Horace Davis, and other items equally important. Davis' resolution, to secure the examination of and report on the tidal area of San Francisco bay, was also passed by the House. The bills which passed, and have been approved by the President, are Senator Farley's and Representative Pacheco's Catholic Bishops' bill; Representative Page's and Senator Booth's bill for the conversion of national gold banks; the bill for the repayment of purchase money, fees and commissions on void entries of public lands, and the bill allowing settlers who may hereafter settle on public lands, surveyed or unsurveyed, the same time to file a homestead application, and perfect the original entry as now allowed settlers under the pre-emption laws to put their claims on record, and opening to claim under the pre-emption and homestead laws of the first settlers who may hereafter settle on the same; and providing further that when a homestead or a timber-culture claimant files a relinquishment of a homestead claim, the land covered by it shall be open to settlement in the manner that it would have been though no entry under the homestead law had ever been made, and Senator Booth's and Representative Davis' bill to increase the pay of the Night Inspectors of Customs, and their bill authorizing the auditing of certain unpaid documents in the Indian Bureau.

The following Pacific coast items appear in the Sundry Civil bill, as passed by Congress during its last day. The other appropriations were passed as originally reported in the estimates: For the completion of the Appraiser's store in San Francisco, $35,000; completing the lighthouse and fog-signal at Tillamook Head, Or., $75,000; lightbouse at Point-no-Point, Washington Territory, $5,000; two assistant agents of the seal fisheries in Alaska, $2,900 each; traveling expenses for agents to and from Alaska, $7,770; for the protection of the Government's interests on the Seal Islands, $30,000; completing the repairs on the wharf and to continue the boring of the artesian well at the Benicia Arsenal, $10,000; continuation of the work on the dry dock at Mare Island, $112,500.

News in Brief.

EX-SENATOR JAMES A. BAYARD, of Delaware, died June 13th.

AT Brown Co., Texes, June 10th, four men were hanged for cattle lifting.

THE Riverdale irrigating ditch, Fresno, is rapidly approaching completion.

LARGE clams, weighing from five to eight lbs each, have been sold at Olympia, W. T.

A DISASTROUS fire-damp explosion is reported from a coal mine at Dortmund, Germany.

THE Mormon agent of immigration reports that Mormonism is largely on the increase.

ANOTHER duel was fought on the Belgian frontier, June 9th, between French journalists.

A CHINAMAN was sentenced at Yreka, Cal., June 8th, to 45 years' imprisonment in the penitentiary.

THE Dayton woolen mills, W. T., have resumed work with enough wool on hand to run them until fall.

FOR the quarter ending June 30th, the profits of the Western Union Telegraph Co. will be about $1,201,185.

THE Trustees of the San Jose Library Association have transferred all the property of the library to the city.

THE Boston firm of iron dealers, Hundlath, Elias & Co., failed, June 11th, with liabilities estimated at $750,000.

THE Western Union Telegraph Co., during nine days in June sent from Chicago a total of 354,965 words per day.

THE dory *Little Western*, with Geo. P. Thomas and Fred. Norman, sailed June 11th on a voyage across the ocean.

THE *Silver State*, Nev., reports that the railroad between Winnemucca and Wadsworth is literally lined with tramps.

WHILE thousands of men, women and children bathe in Great Salt lake yearly, accidents from drowning are unknown.

THE British troops have been ordered to withdraw from Cahul with the least possible delay compatible with their health.

JUNE 8th, was a great day at Milwaukee, Wis., the occasion being the Soldiers' reunion, 150,000 strangers being in the city.

R. R. DONNELL, the defaulting Assessor of Kern Co., Cal., was sentenced to the penitentiary for three years, June 11th.

AT Leadville, Col., June 13th, on account of the riotous disposition of the striking miners, Gov. Pitkin declared martial law.

THE people of Nevada City, Cal., are taking energetic steps to prevent the rebuilding of Chinatown within the city limits.

AT Sioux City, Iowa, June 10th, during a heavy storm, hailstones 11 inches in circumference fell and caused much damage.

A DISPATCH from Lacrosse, Wis., June 11th, says 5,000,000 ft. of loge, valued at $40,000, broke from the boom and were lost.

AT the National Convention of the Greenback Labor party at Chicago, June 8th, the opening prayer was enthusiastically cheered.

EX-GOVERNOR ALBERT G. BROWN, of Mississippi, was thrown from his horse into a pond near his home, June 12th, and drowned.

AT Leadville, Col., a vigilance committee, 3,000 strong, was organized, June 11th, to protect the working miners from the strikers.

GOVERNOR Perkine has appointed as Drainage Commissioners, W. F. Kuox, of Sacramento; W. H. Parks, of Yuba, and Niles Searles, of Nevada.

A NAVAL surgeon from new Caledonia told a French Legislative investigating committee, June 11th, that the convicts were poorly fed, and were cruelly treated with thumbscrews and the hastinado.

AN ILLUSTRATED HANDBOOK.—We have received from the S. F. News Publishing Co., a neatly illustrated handbook of Santa Cruz and Monterey, compiled by Mr. Henry Meyrick. A hasty glance will show it to be a bright and pleasant as well as an extremely useful companion. Its illustrations are light and breezy trifles, and inspire a disposition to cheerful fun. All the points of local interest in either Santa Cruz or Monterey, indeed everything that is attractive in those delightful watering-places, are given in agreeable detail. The brief history of charming old Monterey, with its exquisite scenery and delicious climate, is a bit of good reading. There are, besides, maps of both places. Everyone desirous of finding a piece of lovely and sheltered bay coast, will, we are sure, thank the compiler of this pleasant handbook.

A TERRIBLE CYCLONE.—A dispatch from Iowa, June 11th, gives an account of a terrible cyclone which swept over and devastated the southeastern part of Potowatamie county on the evening of June 9th. Wind clouds were observed to be forming both eastward and westward of Wheeling Grove, the place where the greatest destruction occurred. In a very short time the clouds formed a junction, and assuming a conical shape, came to the ground moving in an easterly direction. The path of the storm was not more than half a mile wide, but in its course everything was completely demolished. Houses and barns were lifted from their foundations and carried hundreds of feet and then dashed to the ground in fragments. From 15 to 20 persons are reported to have been killed, and a large number wounded, and others who were carried off by the fierce wind had not been found. The storm was unattended by rain.

Pocket Mining Atlas,

Containing the principal mining districts in the United States. Compiled from the latest official surveys and the most authentic sources by Edwin Bolitho. Sent, post-paid, on receipt of $1. Address, Dewey & Co., 202 Sansome St., S. F.

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Advancing years, care, sickness, disappointment, and hereditary predisposition—all operate to turn the hair gray, and either of them inclines it to shed prematurely. AYER'S HAIR VIGOR will restore faded or gray, light or red hair to a rich brown or deep black, as may be desired. It softens and cleanses the scalp, giving it a healthy action. It removes and cures dandruff and humors. By its use falling hair is checked, and a new growth will be produced in all cases where the follicles are not destroyed or the glands decayed. Its effects are beautifully shown on brashy, weak, or sickly hair, on which a few applications will produce the gloss and freshness of youth. Harmless and sure in its operation, it is incomparable as a dressing, and is especially valued for the soft lustre and richness of tone it imparts. It contains neither oil nor dye, and will not soil or color white cambric; yet it lasts long on the hair, and keeps it fresh and vigorous.

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Yours truly, LOUIS BROON.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

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Chew JACKSON'S BEST Sweet Navy Tobacco.

METALS.

[WHOLESALE.]

WEDNESDAY M., June 16, 1880.

IRON.—	
American Pig, soft, ton	42 00 @50 00
Scotch Pig, ton	38 00 @42 50
American White Pig, ton	— @35 00
Oregon Pig, ton	28 00 @35 00
Refined Bar	4½@ 8½
Horse Shoe, keg	7 00 @ 8 00
Nail Rod	—@ 9
Norway, according to thickness	8½@ 9½
STEEL.—	
English Cast, lb	16 @ 18
Black Diamond, ordinary size	13 @— 15
Drill	9 @ 10
Flat Bar	— @ 16
Plow Steel	9 @ 10
COPPER.—	
Ingot	— @ 32½
Sheathing	— @— 38
Sheathing, Tinned 14x48	— @ 42
Nails	— @— —
Bolts	38 @— 42
Old	— @— 13
Brazier's, in all sizes	38 @ 41
Precipitate, 100 fine	19 @— 20
LEAD.—	
Pig	6 @— 6½
Bar	— @— 6½
Pipe	— @— 8
Pipe, Soil	— @— 9
Shot, Discount 10% on 500 Bags.	
Drop, per bag	— @ 1 80
Buck, " "	— @ 2 50
Chilled " "	— @ 2 75
TIN PLATES.—	
10x14 I C Charcoal	— @10 50
10x14 I C Coke	10 00 @10 00
Banca Tin	— @25 00
Australian	— @20 00
I. C. Charcoal, Roofing 14x20	— @10 00
" " " 20x28	21 50 @22 00
ZINC.—	
By the Cask	— @—10
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	10½@— 11
NAILS.—	
Assorted sizes	6 50@6 75

RETAIL GROCERIES, ETC.

WEDNESDAY M., June 16, 1880.

Butter, California		Rice	8 @ 12
Choice, lb	25 @ 45	Yeast Pwdr. doz	1 50 @2 00
Cheese	18 @ 25	Oan'd Oysters doz	2 00 @3 50
Eastern	25 @ 30	Syrup, S F Gold'n	75 @1 02
Lard, Cal	18 @ —	Dried Apples, lb	10 @ 14
Eastern	20 @ 25	Ger. Prunes	12½@ 10
Flour, ex. fam, bbl	8 00 @9 00	Figs, Cal	9 @ 15
Corn Meal, lb	2½@ 3	Peaches	11 @ 10
Sugar, wh. crshd	12½@ 13½	Oils, Kerosene	50 @ 60
Light Brown	8 @ 9½	Wines, Old Port	3 50 @5 00
Coffee, Green	23 @ 35	French Claret	1 00 @2 50
Tea, Fine Black	50 @1 00	Cal. doz hot	3 00 @4 50
Finest Japan	55 @1 00	Whisky, O K, gal	3 50 @5 00
Candles, Admt'd	15 @ 25	French Brandy	4 00 @8 00
Soap, Cal	7 @ 10		

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, June 16, 3 P. M.

SILVER, ¾.

GOLD BARS, 890@910. SILVER BARS, 10@18 ⅜ cent. Discount.

EXCHANGE on New York, 25, on London bankers, 493@493, Commercial, 50; Paris, five francs ⅜ dollar; Mexican dollars, 92@93¾.

LONDON Consols, 98 3-16; Bonds (4½), 110¾.

QUICKSILVER in S. F., by the flask, ⅜ lb, 42½@45c.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

DIVIDEND NOTICE.

OFFICE OF THE

Napa Consolidated Quicksilver M. Co.

No. 330 Pine St., Room 16, S. F., Cal.

At a meeting of the Board of Directors of the above named Company, held on THURSDAY, June 3d, 1880, a Dividend (No. 10) of

10 Cents per Share

Was declared upon the capital stock of the Company payable on

Thursday, June 10, 1880.

WM. W. PARRISH, Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, Room 37, S. F., June 15, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, Dividend (No. 56) of Fifty cents (50c.) per share was declared, payable on SATURDAY, June 19, 1880. Transfer books closed until Monday, 21st.

W. W. TRAYLOR, Secretary.

DIVIDEND NOTICE.

Office of the Spaulding Gold and Silver Mining Company—A Stock Dividend has this day been declared, payable to the Stockholders of this Company, on and after the 10th day of June, of three shares of the Republic Mining Company's stock for each five shares of this Company's stock, on presentation of the certificates of stock of this Company.

JOHN HEIN, Secretary.

Office—117 Battery street, San Francisco, Cal. Saturday, May 29, 1880.

Spring Valley Water Works.

The Annual Meeting of the Stockholders

OF THE

SPRING VALLEY WATER WORKS,

For the election of Trustees for the ensuing year and for the transaction of such other business as may be brought before the meeting, will be held at the office of the Company on

WEDNESDAY, JUNE 16, 1880, at 12 M.

By order of the Board of Trustees.

WM. NORRIS, Secretary.

Atlanta Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, West Tintic Mining District, Juab County, Utah.

Notice is hereby given that at a meeting of the Board of Directors, held on the Second day of January, 1880, an assessment (No. 1) of Five Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 7, No. 420 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Fifth (5th) day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Friday, the Twenty-Seventh (27th) day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. P. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, February 26th, 1880, and the day of sale to Monday, the 22nd day of March, 1880. By order of the Board of Directors.

A. F McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Wednesday, the 17th day of March, 1880, and the day of sale to Saturday, the 10th day of April, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, the ninth day of April, 1880, and the day of sale to Wednesday, the fifth day of May, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, April 29th, 1880, and day of sale to Monday, May 24th, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery Street, San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Friday, May 21st, 1880, and day of sale to Wednesday, June 23d, 1880. By order of the Board of Directors. A. F. McGREW, Sec'y.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

POSTPONEMENT.—The delinquent day of the above named Company is hereby postponed until Thursday, June 24, 1880, and day of sale to Monday, July the 19th, 1880. By order of the Board of Directors.

A. F. McGREW, Secretary.

Office—Room 7, No. 420 Montgomery St., San Francisco, California.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the Fifth day of May, 1880, an assessment (No. 42) of 20 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of June, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the Fourteenth day of July, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

A CARD.

ELEVATOR ACCIDENTS.

On January 1st, 1880, the Cage of an Elevator built by me in Robert Sherwood's Union Block, and in the store occupied by Albert Mau & Co., fell and injured three persons who were upon it at the time. This is the first and last instance in which any person has ever been injured by any of my Elevators, and this would not have happened had not the machinery in the basement been tampered with, and the nuts changed on the end of the piston rod.

The Safety Arrangements on the majority of the Elevator Cages, as well as on those previously erected by me, will only act and prevent the cage from falling when the cage rope breaks. Should the machinery below give way, as was the case at Albert Mau & Co.'s and Bauer, Tobriner & Co.'s, the Cage must inevitably fall, with results probably more serious than the accident mentioned. Since then I have spent a great deal of time, study, labor and money to invent some positive safety, which I have at last succeeded in doing. I now place it before the public with the following merits:

I claim that it is light, simple, noiseless, durable and positively an absolute safety. They can be seen in operation at A. B. McCreery's Building, 310 Pine street; Robert Sherwood's Union Block, corner Market and Davis; Cyclops Machine Works, 115 and 117 Beale street; J. C. Johnson & Co., 12 Pine street, and several other places. The price each for them complete and attached to a Passenger Car, is One Hundred and Twenty-five dollars ($125); attached to a Store Cage, complete, One Hundred dollars.

Yours very truly,

PHILIP HINKLE,
116 & 118 Main Street.

We, the undersigned, Engineers and Mechanics, have made an examination of Philip Hinkle's Patent Safety Catch for Elevators, and find it to be light, simple, cheap, noiseless, durable, and a positive safety.

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San Francisco, May 26, 1880.

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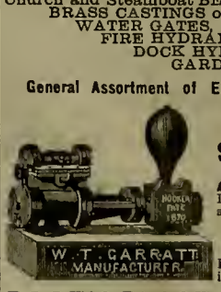

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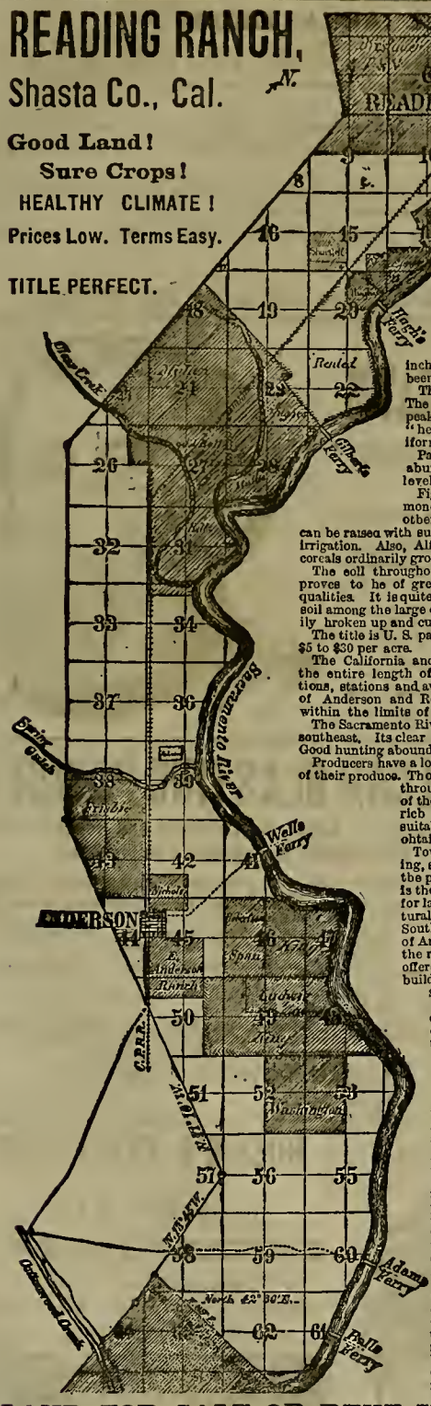

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The soil throughout the tilled portions of the ranch proves to be of great depth and enduring in its good qualities. It is quite free from foul growths. The virgin soil among the large oak trees on the bottom land is easily broken up and cultivated.

The title is U. S. patent. Prices range principally from $5 to $30 per acre.

The California and Oregon railroad traverses nearly the entire length of the tract. There are several sections, stations and switches, besides depots at the towns of Anderson and Reading, all of which are located within the limits of the ranch.

The Sacramento River borders the whole tract on the southeast. Its clear waters are well stocked with fish. Good hunting abounds in the surrounding country.

Producers have a local market, which enhances the value of their produce. The railroad transportation route is level throughout to San Francisco. A portion of the land is auriferous and located near rich mines now being worked. Land suitable for settlers in colonies can be obtained on good terms.

Town lots are offered for sale in Reading, situated on the Sacramento river, at the present terminus of the railroad. It is the converging and distributing point for large, prosperous mining and agricultural districts in Northern California and Southern Oregon. Also, lots in the town of Anderson, situated more centrally on the ranch. Lots in both these towns are offered at a bargain, for the purpose of building up the towns and facilitating settlement of the ranch.

Purchasers are invited to come and see the lands before buying here or elsewhere. Apply on the ranch, to the proprietor,

EDWARD FRISBIE,
Anderson, Shasta Co., Cal.

P. S.—Send postage stamp for illustrated paper containing information about Shasta county and these lands, and say advertised in this paper.

Location of Shasta County.

Shasta County lies not far from midway between the two most important ports on the Pacific shore, i. e., San Francisco and Portland, Oregon, and directly on the overland route, which in the future will become the grand thoroughfare from Mexico to British Columbia. The town of Reading, at present, and probably for years to come, the head of railroad transportation on the California side of the mountains intervening below Oregon, is distant from San Francisco by railroad (via Vallejo) 255 miles; from Sacramento City, 169 miles; from Marysville, 117 miles.

Persons thinking of buying or renting land will not likely regret a camping or excursion trip to this upper Sacramento country.

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FROM 1-4 TO 10,000 lbs. WEIGHT.

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An invaluable substitute for forgings or cast-iron requiring three-fold strength.
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15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over all other Steel Castings.
CRANK SHAFTS, CROSSHEADS and GEARING, specialties.
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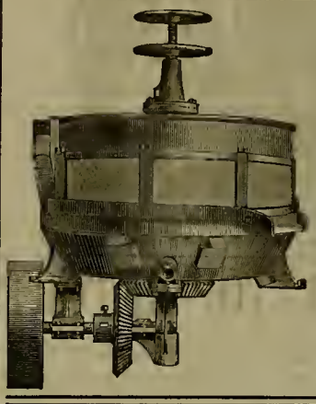
Dewey & Co {202 Sansome St.} Patent Ag'ts | *Engraving done at this office.*

STEIGER & KERR'S
CONTINUOUS DISCHARGE AND GRINDING PAN.



This pan is designed to receive ore direct from a rock breaker, and reduce it to the fineness necessary for amalgamation, thus taking the place of the ordinary stamp battery. The cost of this Mill places it within the reach of all; and one point of advantage not to be overlooked is the fact that the cost of erection, which adds so much to the expense of the stamp mill, after it leaves the foundry is, in this case, reduced to a fraction, as the Mill is complete in itself, and requires no expensive foundations, bed logs, battery frames, etc., but can be placed in position in a few hours after it arrives on the ground, without the aid of skilled labor. This simple arrangement, durable as it is simple, is a most important improvement in the working of gold ores, as it enables parties to construct and erect a mill at half the cost of a stamp mill, and with a great saving of time, and size of mill building. Each pan is capable of reducing 10 tons of average ore in 24 hours, the ore being first broken in a rock breaker, small enough to go through a half-inch screen. There is an important point in the action of this Mill, to which we desire to call the attention of miners and millmen. We allude to the grinding and scouring action on the gold before it is discharged. The value of this point cannot be over estimated, and it is not necessary to do more than mention the fact, as it will be at once recognized by all competent millmen who examine the pan in operation, and especially by those who have had to deal with tarnished or rusty gold, as it is commonly called, and which is often encountered in our mines, and which is such a cause of loss. The pan of feeding is the same as in the stamp mill, either an ore feeder or hand feeding being adopted, as may be desired. Parties interested in mining and mills can see the Pan in operation by calling at the OCCIDENTAL FOUNDRY, STEIGER & KERR, 137 First St., S. F.

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WORKING PLACER, GRAVEL AND QUARTZ MINES,

SAVE YOUR GOLD!

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SILVER PLATED AMALGAMATING PLATES.

The most economical and successful process now in use. Will warrant my Plates to save a very much larger percentage of gold than any other method. Thousands of orders filled and the demand constantly increasing.

Having very extensive facilities for the manufacture of these Plates, will fill orders for California, Colorado Montana, Dakota, Oregon, Idaho, Utah and adjoining States at prices which defy competition.

Metal Goods of every description, including Musical Instruments used by Brass Bands, plated.

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Send for Circular EDWARD G. DENNISTON, PROPRIETOR.

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LEA AND PERRINS' SAUCE,

which are calculated to deceive the Public, Lea and Perrins have adopted A NEW LABEL, bearing their Signature thus,

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which is placed on every bottle of WORCESTERSHIRE SAUCE, and without which none is genuine.

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Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

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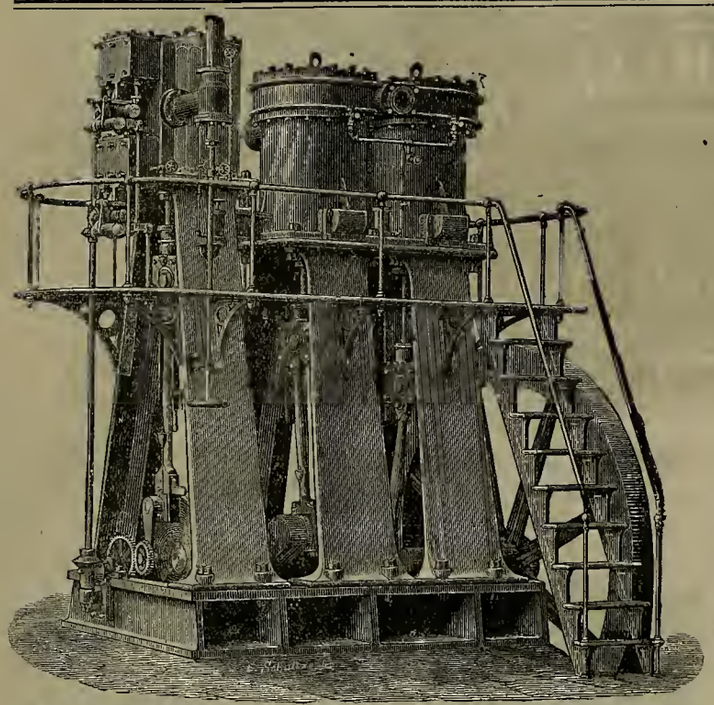

With Adjustable Cut-off Poppet Valve Engine, and Forced Iron Crank Shafts.

Mining Machinery Depot,

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AIR COMPRESSOR.

SPECIAL ADVANTAGES.

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Power applied to the best advantage. Access obtainable to all the valves hy removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

THE NEVADA OVAL TOP RETORT.

The advantage of this Retort over the OLD FLAT PATTERN is, that it can he filled full of Amalgam, thereby holding more than the old style, hesides avoiding all danger of an explosion owing to the crown space in the cover which allows for the expansion. They are made extra heavy, WELL GROUND in the joints, and are furnished with a strong Norway clamp, having a wrought iron key which can he driven in or out of place hy a single stroke of a hammer.

The Annoying Thumb Screw is Entirely done away with.

We Make Seven Sizes, as follows:

Numher or Pints.....	1	2	3	4	5	6	10
Holds Pounds Quicksilver	12½	25	38	50	63	75	125
Weight each..... 10 lbs	15	18	25	31	44	65	

Mortars and Pestles,

GROUND INSIDE.

Size—Quarts....	½	1	2	4	6	8	12	16
Hight—Inches..	37	5	6	7½	8½	9	11	12
Weight—Ponnds	6½	9	16	22	37	43	72	86

Bullion Ladle.

Forged from one piece of Charcoal Iron, eight inches in diameter hy four inches deep.

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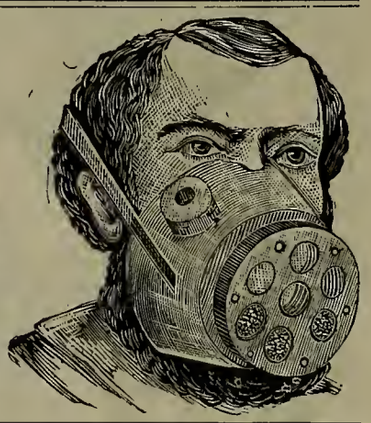

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MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

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No. 1.—Equalling Liquid Nitro-Glycerine in Strength. We recommend this Grade in extremely hard rock, houlders, iron, etc.

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VULCAN POWDER COMPANY,

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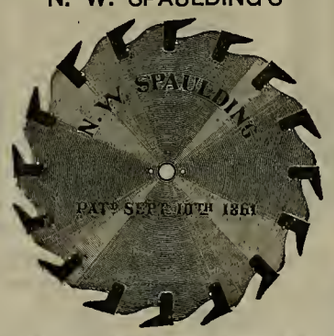

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MESSRS. DEWEY & CO.—*Gentlemen:*—I hereby acknowledge receipt of patent, for which pleasa accept my sincera thanks. Whan I have any further business in this ine I shall certainly employ you. With kind regards, I am, Yours very truly, CHAS. SLATTERBECK.

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Parties wanting Mining Machinery should see this Arastra hefore purchasing. It is practical and cheap, and gives entire satisfaction. Several are in successful operation, and others are huilding for Arizona and elsawhere. Send for circular to

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JUNE 26, 1880.

VOLUME XL Number 26.

Pacific Coast Railroads.

A wondsrful activity in railroad huildiag is manifest in all of the States and Territoriss of the Pacific coast, aad the roads building and thoss projected, when completed, will tap all of the important miaing rcgioas in and wsst of the Rocky monntains. Should aothiag occur to dster work on any of thess roads, in a few ysars therc will hs a astwork of railways from the aorthern tsrritoriss of the United States to the City of Mexico.

Ths Atchison, Topeka & Santa Fe R. R. Co. has coastructed its road from Atchisoa, Kan., to Alhuqusrqne, N. M. Ths St. Louis & San Francisco Co. has hnilt a road from Pierce City to Wichita, Kan., where it connects with the Atchison & Topska railroad to Alhuquerque. From the latter place the St. L. & S. F. R. R. is being extended to San Francisco with all the rapidity possihls. The route follows near ths 35th parallel, through the northern portions of New Mexico and Arizona, crossiag the Colorado river ahout 150 miles north of Yuma. The Atchison & Topska railroad is hsiag pushed southwards towards Guaymas in Sonora on the Gulf of California on the ons hand, with a hranch line to the City of Mexico on the other.

The Southsrn Pacific railroad which is being prcssed forward through Arizona, will connect with the Texas system, and will also connect with ths A. T. and S. F. road whsre they cross sach other near the Rio del Norte, 200 miles sonthwest of Alouquerque.

Last wsek the steamer *Alexandria* sailed from New York for Mexico with a load of rails and cars for ths Central Mexican railroad, which is to be extended north from ths City of Mexico to the frontiers of the United States. A late telegram from Mexico says that 300 lahorers commsnced work on ths southern end of this road on the 25th nlt.

The Arizona & Mexico railroad Trausportation Co.'s road, will commence at Benson, whers the S. P. railroad crosses the San Pedro river, and follow np the river through s rich mining region to Sonora.

The Utah Southern Extension railroad, which it is designsd to extend through Colorado to connect ultimately with thc Atlantic & Pacific railroad is now in operation to a point in Nevada, within 75 miles of Pioche.

The Nevada & Oregon railroad is ths name of a proposed road to run from Reno, Nev., north through Lassen and Modoc counties in California, and up into Oregon. The money for the construction of the road is all ready and work will he commenced at once. The directors of the company are sx-Gov. Woods, John T. Davis, Mr. McMescham, Mr. Moore, Col. Ellis, T. Coffin and J. C. McTarnahan. A railroad is also projected to run south from Rsno to Aurora.

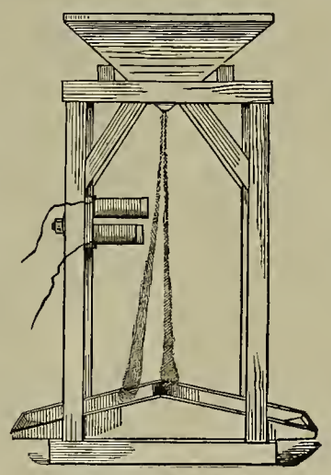
Other Nevada railroads that are being extended southsrly are the Carson & Colorado, on which work was hegun on the 31st ult., the Carson & Virginia now heing pushed forward, and which may eventually connect with the Utah Southern or Atlantic & Pacific, the Nevada Central (narrow gauge) in operation from Battle Mountain, 90 miles aouth to Austin, and the Palisade & Eureka (narrow gauge). The two last named are evidently looking to an ultimate connection with the Utah Southern.

In Oregon work is heing prosecuted on hoth ends of a railroad to run from Portland to the Dalles, and in the eastern part of the State, and in Washington Territory four or five surveying parties are in the field locating the routes of as many proposed roads.

Important Discoveries in Nevada.—Resently important discoveries were reported from the region of Walker river, Nev. Tin is aaid to have heen found hy a Cornish miner. At another point parties found a vein of quartz, which showed hoth gold and silver, hesides some other metal unknown to the finders. In the same neighhorhood aome prospector reports a small copper vein, in parts of which are streaka and pockets of native sulphur. Though copper is the predominant ore, there are also, hesides those specified ahove, ores of nickel, cohalt, lead, zinc and iron. Altogether the region is an interesting puzzle to the ordinary prospector.

Edison's Magnetic Ore Separator.

We give herewith an engraving illustrating the priaciple for the mechanical appliance of which Mr. Edison has rscently taken out a patent. Ths device is intended for tbe separation of the magaetic iron-sand from tailiags in placer diggings. The principle upon which it works will be rsadily scen hy examining the illustration. The concentration is effected hy allowing the sands to fall in front of the facs of a series of electro-magnsts. Ths magnstic attraction changes the trajectory of the falling magnetic sand without stopping its fall, so that while ths silicious sand, gold, and other non-magnetic suhstances fall straight down into one compartment of the rscsiving hopper, the trajectory of the magnetic sand is changed so that it falls into another compartment of the receiving hopper. By this means it is claimed that the separation of ths hlack sand is rapidly and completsly effected with the expenditure of vsry little lahor. Of coursa any numher of magnets of any practical power may he employed in addition to ths two shown. We presume Mr. Edison has expsrimented and determined hy actual test that a column of falliag sand may he thus separated without hsing drawn into



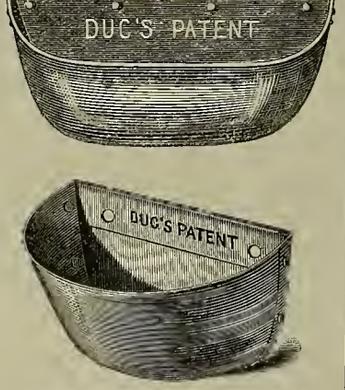
MAGNETIC ORE SEPARATOR.

actual contact with the magnsts. This ssparator could only he used in connection with placer diggings, as the amount of magnetic iron found in the tailings from quartz mills, except the ahrasions from the stamps and mortars, is harely appreciahle.

It is to the interest of evcry section of this coast that local papers should present important items and articles descriptive of their particular localities in such a way that they can he read intelligently hy readcrs at a distance; hut how often do we sce such items written in such a loose style that none hut residents of the vicinity can understand them! Editors should not forget that it is one of the principal functiona of a local paper to make puhlic to the "ontside world," the various resources and capahilities of their districts. Sometimes we read of a new mine that has heen discovered "on the mountain," or "on the fork"—of some stream not mentioned. Again we read that a mill is to he erected on a rich quartz ledge "on the divide," or on the "other side," and are left to draw our own conclusiona as to whether it is the "other side" of a river, range of mountains, mining district or county. Another paper informs us that "Mr. G. has located a claim on the aame ledge now heing prospected with such favorahle results hy Mr. D." Perhaps it is newa to some editors to know that the reason their exchanges do not puhlish the most important items, is hecause other editors do not wish to waste their space or their readers time on enigmas tbat present no possible means of solution.

The Duc Improved Elevator Bucket.

Ws hsrswith give a faithful representation of an improved elevator hucket, a device which is now vsry extsnsively used in a grsat varisty of manufactnriag enterprises. It is especially important to the manufacturers that the best and most reliahle construction of hucket shonld he employed, as hy disorder or hreakage much damags and delay is caused in stoppage of works, stc. Ths Duc improved hucket seems to combins every possible advantage attainahle. It is made in two weights, known as "light" and "heavy"—the former for light works, as for flour, meal, spices, etc., ths latter for heavy, as for handling coal, ores, sand, plaster, etc. This hucket is spherically shaped, so as to givs it the greatest possible strength, with ths least weight of metal. The principle of the arch is emhodied in evsry angle. This form also secures for it the greatest freedom and certainty in taking up and delivering its contents, as it is well known that a scoop can he handled much easisr than a square shovel, and there are no cornsrs in the former in which the material to hs elevated can "clog up." The Duc hucket is made of charcoal stamping iron, is struck out at ons operation with dies in 10 sizes—from 3½ to 10 inches. The two illustrations which we give will convey a very correct idea of its form. It is heing very generally introduced at the East for almost every description of business requir-



IMPROVED ELEVATOR BUCKETS.

ing such elevators. Mssrs. H. P. Gregory & Co., Nos. 2 and 4 California St., ars the agents for this coast.

Enlarging the Union Shaft.—According to the Virginia *Chronicle* of June 12th, the shaft of the Union Con. is to hs enlargsd from ths surface to the 1800 level hy the addition of a fourth compartment. Below the 1800 level there are now four compartments. In the new compartment there will he run a johhing cage, which will he used for carrying tools and all other articles up and down, and for doing all kinds of odd johs, hy which change the regular cages can he used without interruption for hoistiag ore. In enlarging the shaft it will he attacked in five different places. The drain tunnel, which leaves the shaft at a depth of 175 ft. helow the surface, will he utilized as a place of discharge for much of the waste rock that will he excavated in cutting out the new compartment. This improvement will increase the ventilation of the shaft and render it the most convenient and complete on the Comstock. Aa soon as the large pumps can he used down to the 2500 level the use of the donkey pumps run hy compressed air will he dispensed with, which will lead to a large saving in fuel.

As an evidence of the richness of Eureka's mines, says the *Leader*, we have only to refer to the El Dorado, on Prospect mountain. This mine, although not over 150 ft. down in the deepest place, has yielded, aince its location, in the neighhorhood of $500,000, and at present ia looking better tban it ever did.

Death of General Sutter.

The deatb of this distinguisbed man occurred suddenly at Washiagton on Friday, the 18th inst., at the advanced age of 77. Gen. Suttsr's life was more than ordinarily svsntful. Born in Switzerland, hs came to the U. S. in 1834, and shortly afterwards went to Missouri, where he manifestad that spirit of enterprise which characterised his lifs. Hs laid out a town, stores and mills wsre erected, and he eagaged in trading witb Santa Fe. Conceiving ths idea of fouadiag an Amsrican colony on the Pacific, hs organized a company and set out on his psrilous journey across the continent. He was hsset hy obstacles from ths first step, bnt his resolution was indomitahle. After months of delay, perplexity and fatigus, dnring which he attempted to reach San Francisco through Orsgon, the Sandwich Islands and Alaska, he chartsred a vessel at the latter plaes and reached the desired Yerha Buena, only to learn that it was not a port of entry, and that after rsplenishing the vessel's exhausted stores he must take his dsparture. The vesssl thsn sailed for Monterey, whsre Sutter was kindly recsived by Gov. Alvarado, who, learning of his project of fonnding a colony in the Sacramento valley, then filled with numerous trihss of hostile Indians, readily assigned him some 30 leagues of land in that and adjoining valleys. Gen. Sutter at once proceeded to ths sits of the grant, and sslected a point nsar the present city of Sacramento, whers he huilt a fort and founded the sttlement of New Helvstia. All this sounds more liks romancs than cold history.

With his charactsristic energy Gsn. Sutter huilt workshops and storss, and cultivated large tracts of land with the rude labor of the Indians, and later on hs had a launch running weekly hetwsen the fort and San Francisco. It was in carrying ont his enterprise of building a sawmill on the American river that two of his employees, Marshall and ths lad Weimar, picked up the piece of gold which lies at tbe foundation of the civilization of California. Gen. Sutter dispsnsed his hospitality with a fine courtesy; and no man, however humhls, lsft his door empty-handed or sorrowful. When the officers of the Government applied to him for sustenance for their men, Gen. Sutter slaughtered his herds and emptied his granaries, and it is said that up to the day of his death he was hopeful that his claim for remuneration would hs allowed and paid.

Gen. Sutter was rsmarkahls for ths swsetnsss of his disposition. One who met him frequently in the earlier days of California, says he nsvsr heard him uss an oath nor a foul word, and that he nevsr entered his workshops without raising his hat, and giving a kindly salutation to his workmsn.

Settlement with Government Timber Trespassers.—Dispatches from Washington are that the hill concerning timher-land trespasses, as finally agreed upon hy the Committee of Conference and passed hy hoth Houses Monday, contains Senator Farley's amendment extending its provisions to the Pacific States and Territories. It applies to all trespasses committed prior to March 1, 1875, and in regard to all of them it relievea actual trespassers from hoth civil and criminal responsihility, upon payment of costs of suits already commenced, and the suhmission of proof that the trespassers have auhsequently entered and paid the full Government price for the lands. The hill further provides that no civil suits shall he maintained for any trespass upon or on account of material taken from said lands, of the ordinary clearing of land, or of working a mining claim, or for agricultural or domestic purposes in maintaining improvements on the land of hona fide settlers, or on account of any materials taken hy any parson without the knowledge of the trespass, or without fraud or collusion hy any person who, in good faith, has paid the officers of the United States therefor. Suits for ahout $80,000 are now pending hefore the U. S. Court in Nevada for the value of timher cut from Government lands, and many othera are understood to be pending in California and various Territories.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Ed

Peru Mining District.

Editors Press:—The following items about minee due south of Bakersfield in the San Emidio mountains, the highest of that range which connects the Sierra Nevada and the Coast Range, and form the southern boundary of the great San Joaquin valley, are from authentic eources and may be of interest to your readers. These mines are in what is known as the

Peru Mining District,

Whicb takes its name from the principal creek in that locality. They are in the nortbeastern corner of Ventura county, their central point, Arastra flat, being about three miles south of the Kern county line, and 62 miles in a direct line south of Bakersfield, or about 65 hy stage road via Ft. Tejon. They are about the same distance west of Newhall, on the Southern Pacific railroad. The chief mines in the district are called the Bright Star, Monitor, Neptune, Mammoth No. 2, and Eclipse. There are believed to be at least two true fissure veins there. Frazier creek and ite branches drain the water shed formed hy the elopee containing these ledges. On this creek, south of these ledges, is Arastra flat, with its location for a future mill site (an arastra ie now at work), and tbe cabin of J. G. Parke, one of tbe principal owners in these mines, and who has given me most of the facts here presented. The altitude of this site ie about 5,500 ft. above sea level. The ledges above named are about 6,000 ft. above the sea, while etill higher up and about a mile and a half north of Arastra flat is the old Frazier mine, known and worked more or less at intervals since 1868. Its altitude is about 7,000 ft. The highest adjacent peak is about half a mile west of this old mine; it is called Frazier peak and its altitude was fixed at 7,750 ft. hy Lieut. Wheeler, who made it an important station in his Government survey west of the 100th meridian. This high peak stands near the 119th meridian. We ehould mention in tbis connection, that the bighest peak found in all this mountain range, according to Wheeler, is

Alamo Peak,

About six miles south of Frazier peak. Hie measurement showed it to be some 1,200 ft. bigher than the latter, or about 9,000 ft. altitude. Its name, Alamo, meaning poplar, is given from a number of mountaiu poplars growing near its hase. The ledges trend uearly nortb and south, and dip east from 30° to 35°. They vary in width from 2 to 12 ft. The country rock is granite, gneiss and talcose slate, with blue clay gouge, wet and putty-like, from an inch to a foot tbick, between the gangue and ledges. The nature of the quartz is free gold, ahundance of sulphurets, traces of silver and a copper stain. Several assays of the different ores have ranged from $12 to $130 gold, others higher, about 20% of the assay being silver. Although tbe elovenly and irregular mode of working the Frazier mine gave this district a had name at one time, that mine itself is known to he a good one, having yielded $100 per ton, when worked with very inferior machinery. It has a 10-stamp mill. Not only bas its bad management, in former years, injured the repute of the district, hut handitti have rohhed its hatteries on at least two occasions. To give an idea of its natural good quality, we can state the fact that its old tailings down the gulch, a mile and a balf helow it, are now heing worked with an ordinary rocker, and yield $6 to 40 buckets of tailings.

On Peru Creek,

A living etream that givee the district its uame, and which runs east and eoutheast into Santa Clara river, furnishing from 800 to 4,000 inches of water at different seasons of the year, are numerous ledges of silver, gold and argentiferone galena. A mile south of these galena ledges and on Peru creek, are five arastras now in successful operation, and six others in course of construction. The fall of Pern creek near these mines is about 230 ft. per mile, furnishing excellent water-power.

Near the fork of Peru and Lockwood creeks, about three miles southwest of the galena mines, are ahundant evidences of old placer mining done at least 30 years ago. It is thought they may have been worked even earlier than that hy the old Padres from San Gahriel Mission near Los Angeles, for the locality is only about 90 miles northeast of the latter city.

Mexicane and others are now working these placer mines with good results. The altitude of this junction ahove the sea is ahout 4,600 ft.

Evidences of Early Mining

By the Padres are, that in an old arastra, near Frazier peak, an oak ahout a foot in diameter ie growing, and several old smelting furnaces have heen discovered in Kern county, ahout eight miles further north.

Dr. W. B. Brink, of Bakersfield, who has had considerahle experience in mining and assaying, assures me that in 1869, a piece of eilver ore was found near an old arastra in that vicinity, which yielded by an assay he made $2,200 in silver to the ton.

Parties bave lately been diligently prospecting for the ledge from which this rich ore is supposed to bave come, and rumors, in which some credence is placed, have reached Bakersfisld that such a ledge has just heen found.

Dr. Brink has within a few days received from Peru creek several fine specimens of argentiferous galena, which he is satisfied will yield over $200 silver per ton.

The Supply of Timber

In the Peru district, which extends 20 miles north and south, and 12 miles east and west, is ahundant enough to last centuries for mining purposes. It consists not only of oake, hut pines and firs, from two to five ft. in diameter.

Great as is the altitude of this district, those who spent last winter there were hut little troubled hy the snow. Twice it fell at Arastra flat to a depth of three ft.; but it lay on the ground there only ahout 48 hours each time. On the higher peaks and ridges eome of it etill remains, and is yet visible—a most unusual occurrence—from Bakersfield and the surrounding country. That whole mountain region ie very healthy. Thc lowest temperature last winter was only ahout 20°, or 12° helow freezing.

Mr. J. G. Parke, former Surveyor of Kern county, and now U. S. Deputy Mineral Surveyor, extende

A Cordial Invitation

To mining experts and others who may wish to visit and examine this mining region, in which a general interest is deservedly increasing. His arastra in Arastra flat was completed last April to work orcs from the ledges of Frazier canyon. His location is about 13 miles south of Fort Tejon. The old stage road from Bakersfield to Los Angeles passes within six miles of his camp. From that there is a good wagon road to within two and a half miles of his millsite. He now has a sled road over that distance, and estimates that a good wagon road can be made over tbe two and a half miles for $500. Mr. Parke's address is Bakersfield, and he will gladly give further information to any who may wish to consult him hy letter.

An item of interest worthy of record here, is tbat

A Large Ledge of Good Lignite,

Or Coast Range coal, was found this spring on the Tejon grant, about 12 miles northeast of Fort Tejon. It is ahout four ft. wide and dips westward some 45°. It has heen used in a furnace on Tejon ranch, and burns like Kennol coal.

This "Peru mining district" is undoubtedly one of the most intereeting that are uow heing prospected and developed under the new impetus of mining in California.

Bakersfield, June 8th. J. W. A. W.

About Utilizing Tailings.

Mr. A. D. Ballard, at Silver City, says tbe *Territorial Enterprise*, has been exporimenting by a new process upou tailings. This process is euhstantially the same as working gold ore by amalgamating on copper plates. It is not generally believed that silver ores can be worked to any high percentage hy this method, though Mr. Ballard claims satisfactory results so far. Iu a camp like Bodie or the Black hills his process is worth close attention. Really, there is no further questiou as regards working Comstock tailings hut that of location, quantity and assay value. Unless tailings are rieh, and such were mostly worked up years ago, cheap power, large quantity and economical management are necessary. Tbere must he ample room for drying, and wood and water must he cheap. Along Carson river are all these advantages. The Lyon mill and mining company has worked from 2,000 to 5,000 tons of tailings per month for the last 11 years which could not have paid expenses in another location. This company has water power and manufactures its own bluestone. Its tailings are thoroughly oxidized hefore going to the mill.

The Atlanta property, at Johntown, ie now paying well, and will he likely to retrieve many of ite past failures. Thie is chiefly owing to the long time the tailings have been exposed to the action of the sun and storm, as the older the "reservoir" is the more freely it works. The parties now working the Atlanta will soon go for the large quantity of tailings in Washoe valley helonging to the Union foundry, and will hardly make any failure.

Tbe amount of tailings in this vicinity is large. At nearly every mill on the Carson river is a large reservoir, and on the Ophir flat, ahove Daytoo, are 500,000 tons. There are eeveral large banks about Silver City, and on the Parke property, Six-Mile canyon, is a hody second only to that of the Ophir flat.

The conditions are not favorahle for working all these tailings, hut witbin a year or two it is most likely that all will he in shape to afford some profit to the owners. Tailings which average $6 on the Carson will pay now, hut would not about Virginia City or in Six-Mile canyon as yet.

Among the most important improvements adopted latcly is that of preparing liquid copper solution and refining bullion on the premises, as tbis in many cases will alone make the difference hetween profit and loss.

It is best for all who own tailings that will not afford them any present profit, to wait patiently, for their time will come, and prove all the better for the waiting.

At French Gulch, Shasta county, one of tbe quartz miners crushed 2,500 lbs. of rock, a few days ago, and obtained 25 ozs. of gold.

The Gunnison Country.

A writer in tbe Lsadville (Col.) *Chronicle* gives a voluminous and interesting description of the Gnnnison country, whicb has lately attracted so mnch attention. Gunnison City, he says, is I93 miles from Leadville, and is reached by roads of every conceivable character leading over mountaine and across valleys innumerable. The altitude of this place is about 8,500 ft. The name Gunnison City is given to two towns, the old and new, probahly a mile apart and both are laid off—wide etreets and regular equaree and blocks, ae is the intervening space. In all, about 120 houses have heen erected, all small buildings, very poorly constructed, and almost unfinished. Lumher is an article nearly impossihle to ohtain. The only sawmill in the country is 20 miles up Lumher creek, and has only a 3,000 ft. per day capacity; house logs are an equal distance away and green. Sunhurnt hricke or adobes are used to eome extent. The Red Lion, a two-story hrick building is hnilt of them, partitions and all. Tents are used to poor advantage on account of the wind which hardly ever ceases to hlow a gale, chilly and cold from the immense fields of snow on either side. Along the banks of the Gunnison not less than 2,000 people are camped in tents, awaiting the melting away of the snow above.

Up to the time of the writer's departure there was bnt one game—keno—running, but he met two four-horse loads of gambling fixtures out from Buena Vista. Gunnison has a city government, a gentleman named Kubler wearing the Mayor's rohe. Ruhy Camp, the mention of whicb etrikes a chill to one who has been there, is 32 miles from Gunnison, up the river to the confluence of Ohio creek and up the Ohio creek to its very eource, which is hut 3 miles from Ruhy. All merchandise going into Ruhy breaks hulk at King's, and is transferred to the hacks of men who pack it across the snow for 7 cents per pound. Ahout 20 of these fellows are constantly employed. A road hae heen hnilt into Ruby, hut from 5 to 30 ft. of snow will bold it down until at least the 1st of June. There are three town-sites, Ruhy City, Irwin and Ruhy Camp. At the first named not so much as a cahin as yet gladdene the eye. On paper the streets are hroad and straight, with a plaza in the center of the town. You are told hy men interested that one block facing the plaza is reserved for McPherson's hank, that a portion of another will he used hy Mr. Langrishe for an opera house. The snow now levels the entire country.

About 400 locations have been made upon the mountain side flanking the town and around the lake. The same complications of claims exist as in any other place, and the same amount of litigation will be necessary to untangle them. The writer was ahle to find hut one man at work, and be in a tunnel about 20 ft., and thus far hut a prospect. The Forest Queen is the most talked-ahout in tbe district. It ie situated to the right of the lower town, and is opened hy a tunnel and sbaft, hoth filled with snow and ice. Something like 40 tons of ore were sacked and etowed away in a tent, from which a piece was taken at random, and assayed at random with the following result: 55½ ouuces of silver, $71.64. The ore was of the galena epecies, with white spar being attached in several places.

Good prospects have heen found in all of the districts, but nothing to raise more than a ripple of enthusiasm. The journey through the Gunnison suggests an idea to the writer that will do for the uninitiated to act upon, and may not please the class to which it refere, and that is a class of adventurous, cunning, smart fellows, "rustlere" they are called, who push into new territory, locate a townsite, get an elahorate mah, and hy everlasting chinning, secure a form for their town, sell lots, give away lots, ewap whole blocks for a etack of reds, any way to make a raise. Hundreds are fooled, a few hedge and get out, hut those least ahle to stand the loss are the dupes.

The Defiance district is at the headwaters of Roaring Fork, ahout 20 miles heyond the Ute reservation. The principal camp is known as Defiance City, at the confluence of Roaring Fork and Grand river.

The Roaring Fork mining district comprises that portion of the silurian or carhonate belt that cuts the Roaring Fork river in the vicinity of Maroon, Castle, Hunter and Woody cresks. The entire district, up to the present date, is but an enormous prospect camp. Ten ft. is the average depth of shaft right through all the claims. It is not, therefore, strange that theee surface assays should he on the average low.

The principal towns of the district are Highland, Roaring Fork City, Aspen and Ute City. Merchants have located at each place, and large etocks of merchandise are heing freighted in.

A Valuable Gold Vein.—The Gold Hill *News*, June 10th, saye that Capt. Kelly had just returned from a visit to the Victorine mine at Kingston, Lander county, 28 miles south of Anstin. The ledge is from 8 to 10 ft. in width, and has been uncovered hy a drift 70 ft. in length. It has taken what is eupposed to he its true course, and pitchee into the hill. Capt. Kelly took five samples, the assaye of which average $75. Nine-tenths of the metal ie gold and the other tenth silver. A mill has heen purchased and the reduction of ore will be soon commenced. Fifty men are employed. Tbe property is under the management of Edward S. Stokes, who is backed by Felton, the S. F. capitalist.

Calaveras and Tuolumne Mines.

For a long time, capital has been quietly seeking invsstment in the mines of Calaveras and Tuolumne, and large sums bave been expended during the past year in making the necessary preparations for active work on a large scale. Occasionally machinery goes forward from this city by railroad to Milton and to Oakdale, eome wholly new outfits, and other consignments only parts of mille for crushing rock, all going to show a steady purpose of development of quartz minee in the counties named. Capitalists do not usually invest in anything with a view of permitting their money to remain idle, and it is, therefore, reasonahle to expect some eort of an ontcome, at as early a date as practicahle, from the large investmente that have heen made within the last year or two in the mining range, from Mokelumne Hill, or the northern houndary of Calaveras, through the center of the latter county, acrose the Stanislaus, and embracing an extensive mineral area in Tuolumne county. Murphy'e, Douglase' Flat, Vallecito, and along south across the Stanielaus river to Columbia and Sonora in Tuolumne county, miners will he coaxing the precious metal from the earth and rock with picks, drills and giant powder, for a century to come. The region traced is probahly the richest mining territory within the limits of the State, and it ie only a question of time, and a very short time at that, when thousands, inetead of hundreds, of men, experienced, practical miners, will find profitable and permanent occupation in that section, build up homes, flourishing villages, school-houses, churches, and gather around them all the accompaniments and comforts inseparable from prosperity and a high order of civilized life. Many rieh minee that have long been owned and held hy individuals wbo have heen unahle to make any marked progress in the way of development, are either passing into the hands of capitalists or nnder the control of organized companies who propose, by united effort, to put their actual value to a thorough practical test. For that purpose the present season is particularly auspicious. The work that has heen quietly going on promises practical results this summer. Quartz crushing will he more lively henceforth, in the counties named, than ever before, and the hoom in placer mining tbis season is likely to exceed anything experienced in that line for many years. There will be abundant supply of water for hydraulic and other placer mining operations. Everything betokens the inauguration of a new era of mining industry in old Tuolumne and Calaveras counties, and with it will inevitahly come renewed prosperity in every other branch of local husiness.—*Stockton Independent.*

The Cortez District.

Cortez is one of tbe oldest mining districts in eastern Nevada, and for a numher of years nearly the entire mining operations of the district have been carried on hy Mr. Simon Wenhan, who has in a quiet way produced large amounts of silver bullion. Recsntly the Eureka *Sentinel* was informed that his principal mine, called the Garrison, looked better than ever hefore. He has now three eplendid honanzas, whereas he never had but one at any time in the past. All of these are large, and give assurance of hoth richness and permanence. The ore hodiee occur in the vicinity of the 300 and 400 levels. The ore of the Garrison has always gone extremely high, and the present reserves are as good as the best the mine has ever produced. A new tunnel has heen etarted to tap the mine helow present developments. The tunnel ie in over 300 ft. When completed it will greatly facilitate the extraction of ore, as the cost of hoisting will be therehy saved. It is in contemplation hy Mr. Wenhan to construct a new mill this eeason near the mouth of the tunnel. The cost of hauling and packing, which are important items, will also he saved. He thinks the condition of the mine will warrant the outlay for a new mill. The mill now used is situated ahout eight milee from the mine. A tunnel is likewise heing run hack of tbe residence for water to supply the proposed new mill. This tunnel has attained a length of ahout 700 ft. Should it fail to develop water, a eupply can he brought in pipes a distance of seven miles, at an estimated cost of 1,000 per mile. If the new mill is nndertaken, and there is hardly a douht that it will be, Cortez will he quite a husy little place in the near future, giving employment to quite a large force of men. Mr. Wenhan has built himself a eplendid residence within the past year, and is ae comfortahly situated as any man in Nevada. He is surrounded hy a most interesting family, and all are contented and happy, notwithstanding they reside in the wilderness. Mr. Wenhan has etuck to Cortez for tbe last 17 years, and richly deserves his good fortune.

Cost of two Tunnels Compared.—The acceleration and economy realized in the St. Gothard, as compared with the Mount Cenis tunnel, may he thus hriefly indicated: The latter, 12,233.56 meters in length, took 13 years and 1 month to make. The former which is 2,686.45 metere longer, only seven years and five months. The mean monthly advance in the Cenis tunnel was 71.551 meters; in the St. Gothard, 167.640 meters, or more than douhle. And the total cost of the St. Gothard will be ahont 25% to 30% less than that of the Cenis.

MECHANICAL PROGRESS.

Physical Changes in Iron and Steel.

At a recent session of the British Iron and Steel Institute, Mr. Thomas Wrightson read a paper entitled "Some Physical Changes in Iron and Steel at High Temperatures," in which he detailed a number of facts observed by him and bearing upon that much discussed subject, the floating of solid cast iron in liquid iron. Mr. Wrightson has constructed an apparatus, called by him the ovosimeter, for measuring the changes of volume in cast iron when passing from the liquid to the solid state. He found that, while cooling from the liquid to the solid state, cast iron expands as much as 0.51% lineally, which is equivalent to an increase in volume of 1.53%. Again, in contracting from its maximum volume to its cold state, it decreased in diameter 1.17% lineally, or 3.51% in volume. He also made a series of experiments with balls of Cleveland foundry pig immersed in fluid iron of the same quality, and found that on the average the iron, in passing from the solid to the plastic condition, expands from a specific gravity of 6.95, when cold, to 6.50, when plastic, while the fluid iron has a density of 6.88. He holds that the separation of graphite cannot be the cause of the expansion of the iron when cooling down from the liquid to the plastic state, because white iron, which has no or little graphitic carbon, does not act differently, but expands considerably. The paper brought about quite a long and animated discussion, which, however, did not contribute much towards a final settlement of the questions at issue.

In connection with the above it may be interesting to call attention to the physical changes which take place in iron and steel, when, as a wire, it is immersed in acidulated water. At the late meeting of the American Society of Telegraphic Engineers, Prof. Hughes read an interesting paper on the above subject, in which he said that the mere dipping of a piece of iron wire in sulphuric acid rendered it very brittle, and gave it many of the characteristics of steel. In the discussion which followed, Mr. Chandler Roberts announced the fact that he had succeeded in extracting from such acid-treated iron 20 times its volume of hydrogen, and he maintained that there was some relation as of cause and effect between the occlusion of this gas, and the brittleness exhibited by the metal. The reader will notice the general similarity between these observations and the remarkable results obtained by Mr. Edison when experimenting with platinum spirals for his electric lamps, which have been fully noticed in this department.

Use and Care of Files.

In selecting files, those which are warped are fit only for the commonest uses, and should be rejected for accurate work. The practiced eye readily detects the sprung file, even when, as in the bastard file, the faces and edges are convex. The file handle is important. It is not a chisel handle, nor a misshapen chunk of wood, nor a section of broom handle. The file handle is a simple handle, but it is a file handle, *sui generis*, and nothing else. It should be of soft wood—not pine—cucumber wood, bass wood or "popple" (poplar), without varnish or oil, or any finish but the turning chisel. Insert the tang of the file until it passes readily two-thirds of its length; then, holding the handle and file point downward in the left hand, give a few smart raps on the end of the handle with the hammer and the file will jump to place.

It is well to chalk one face of a file, keeping it intact until the other face is worn. A new file should never be used on the skin or scale of cast iron. After the scale is removed the new file may be used, and when it does not take well on cast iron it will cut wrought iron. Fibrous chips of wrought iron that cannot be removed by the card should be dislodged by a bit of wire—No. 8 iron wire—formed into a ring at one end for a handle, and at the other end flattened or broomed out while cold under the hammer on an anvil. To use this implement, rest the point of the file on the bench at a convenient angle, and strike the flattened wire edge across the file face in the direction of the teeth cut. If the file used in finishing with oil becomes clogged, warm it over the forge fire, the gas or lamp, and it will yield to the persuasions of the card, or if not, pour a little oil on the file and blaze the dirt off. It will not draw the temper.—*Boston Journal of Commerce.*

Perfection of Modern Machinery.—The degree of perfection that machinery has reached is shown by the work of the New Indiana State house. But seven men are building this immense structure, and their progress daily is from 17 to 20 times greater than that of the large force of workmen employed when the court house was built. The cause of this great saving is the little "travelers" now in use at the State house. These are small engines that run upon the scaffold tracks in all directions, and work which required 15 men with the old derricks. They also save much time, for one that was formerly laid in from two to three hours, is now placed in position in 15 minutes, with scarcely any trouble or extra exertion on the part of the workmen.

The Lead Bath for Tempering.

Among the many secrets of tempering is the employment of the lead bath, which is simply a quantity of molten lead, contained in a suitable receptacle and kept hot over a fire. The uses of this bath are many. For instance, if it be desired to heat an article that is thick in one portion and thin in another, every mechanic knows how difficult it is to heat the thick portion without overheating the thin part. If the lead bath be made and kept at a red heat, no matter how thick the article may be, provided sufficient time be given, both the thick and thin parts will be evenly and equally heated, and at the same time get no hotter than the bath in which they are immersed.

For heating thin cutting blades, springs, surgical instruments, softening the tangs of tools, etc., this bath is unequaled.

If a portion of an article be required to be left soft, as the end of a spring that is to be bent or riveted, the entire spring may be tempered, and the end to be soft may be safely drawn in the lead bath to the lowest point that steel can be annealed without disturbing in the least the temper of the spring not plunged in the bath. Springs, or articles made of spring brass, may be treated in the same manner. A great advantage in the use of the lead bath is that there is no risk of breakage by the shrinkage of the metal at the water line, as is often the case when tempered by the method of heating and chilling in cold water.

As lead slowly oxidizes at a red heat, two methods may be used to prevent it. One is to cover the surface of the lead with a layer of fine charcoal or even common wood ashes. Another, and a better plan, is to float on the top of the lead a thin iron plate, fitting the vessel in which the lead is contained, but having a hole in the center or in one side, as most convenient, and large enough to readily admit of receiving the articles to be tempered or softened. *Blacksmith and Wheelwright.*

Wear of Rails on an Incline.—On a down grade of 1 in 38 on the Aachen railroad, in Germany, the amount of rail wear per 1,000,000 kilometric tons (of 2,205 lbs.), gross weight, was 3.059 inches, so that a rail was completely worn out in 5 years. On Aug. 10, 1878, as an experiment, cast-steel brake-blocks were substituted for the wrought-iron ones on the left side. On taking measurements May 6, 1879, it was found that the left rail was worn down 0.287 inches, the right rail 0.35 inches, while formerly the rail on the right side was least worn. For the sake of obtaining a certain result, the brake-blocks were exchanged right with left, on the 6th of June, and the hight of the rail (20 lengths on each side of the track) carefully measured. According to the measurements made on Sept. 18th and Nov. 24, 1879, the wear on the steel brake-locks side amounted to 0.05 inches, on the side where the wrought-iron blocks were used, 0.086 inches per 1,000,000 tons gross load. On a down grade of 1 in 75, between Heissen and Mulheim, the rail wear, with a gross load of 34,000,000 tons, amounted to 0.507 inches in 8 years. The chief engineer of the road can only attribute the enormous amount of wear to the fact that the soft wrought-iron blocks bold the wheels perfectly tight, while the hard steel has not such a grip on them, they occasionally slip round, and less friction results to the track.

Cast Iron on Cast Iron.—A practical mechanic, who is an ingenious inventor, a thinking man, and whose experience as a mechanic embraces a period of not less than two score years, insists that cast iron on cast iron makes the best box and journal in use. He repudiates Babbitt metal and steel, iron and composition, and all attempts to reduce friction and perfect bearing surfaces in motion by the use of different metals. He carries his theory into practice as a builder of machinery, and clinches his argument by a 15-years' use of a swiftly rotating, loose pulley of cast iron on a cast-iron stud, and by many other examples of the advantages of the practice. The opinion of such a man, one not given to visionary notions or pet hobbies at the expense of fact, is of value—at least it is worth consideration. The theory may be that the plumbago known to exist as a component part of cast iron, fills the porea of the two rubbing surfaces and forms a glaze to resist grinding. But whatever the theory or cause, this mechanic claims that he has demonstrated that cast iron on cast iron make better journals and boxes than any two differing metals.—*Ex.*

The Substitution of Steel for Iron.—The substitution of steel for iron has made another step in advance, and in a direction where, if the hopes of the inventors are justified by the result, we may expect to see considerable changes. Hitherto the metal work of our ordinary driving carriages has been wholly iron, except in those instances where the partial introduction of steel took the place of any additional ornament. A well-known coach-building firm at the East has now on view the specimen of a carriage built wholly of steel—spring, tire, framework, etc.; and it is calculated that the saving in weight will be nearly 25%, with possibly better results in future; whilst for supporting wear and tear the preference for steel over iron will, when its advantages are known, be as strongly endorsed by owners of carriages as they now are by directors and managers of railroads.

SCIENTIFIC PROGRESS.

What We May Come To.

Proctor, writing in his latest volume—"The Flowers of the Sky"—remarks: It is no longer a mere fancy that each star is a sun—science has made this an assured fact, which no astronomer thinks of doubting. We know that in certain general respects each star resembles our sun.

Each is glowing like our sun with an intense heat. We know that in each star processes resembling in violence those taking place in our own sun must be continually in progress, and that such processes must be accompanied by a noise and tumult, compared with which all the forms of uproar known upon our earth are as absolute silence. The crash of the thunderbolt, the bellowing of the volcano, the awful groaning of the earthquake, the roar of the hurricane, the reverberating peals of loudest thunder, any of these, or all combined, are as nothing compared with the tumult raging over every square mile, every square yard of the surface of each one among the stars.

He proceeds to describe, with considerable circumstantiality, the two appearances witnessed in the heavens within the last few years—that in 1866 when a tenth magnitude star in the constellation of the Northern Crown suddenly shone as a second magnitude, afterward rapidly diminishing in luster; and that in 1876 when a new star became visible in the constellation Cygnus, subsequently fading again so as to be only perceptible by means of a telescope.

After noting the conclusions deduced from the application of the most improved instruments to these observations, he remarks:

A change in our own sun, such as affected the star of Cygnus, or that other star in the Northern Crown, would unquestionably destroy every living creature on the face of this earth; nor could any even escape which may exist on the other planets of the solar system. The star in the Northern Crown shone out with more than 800 times its former luster; the star in Cygnus with from 500 to many thousand times its former luster, even if we take the highest possible estimate of its brightness before the catastrophe, or consider that it may have been very much brighter. Now if our sun were to increase tenfold in brightness, all the higher forms of animal life, and nearly all forms of vegetable life, would inevitably be destroyed on this earth.

Street Lamps Extinguished by Atmospheric Disturbance.—The New York *Gas Light Journal* gives some interesting particulars in regard to a singular atmospheric disturbance, which was noticed in and near the city of New York on the night of the 16th of April last. A large number of street lamps were extinguished, without any apparent cause, until observations showed that a very important atmospheric disturbance was registered by the self-recording pressure gauge instruments. It appears that the pressure gauge registers showed a very decided rise and fall of pressure at about 11:45 P. M. In some cases the pressure fell first and then suddenly rose, while in others it rose first and then fell—the extreme variation was 16 tenths. At the same time the self-registering barometer at the Meteorological Observatory showed a corresponding disturbance in the atmospheric pressure. In a number of cases street lights were extinguished in certain localities; but the disturbance seemed to be confined to a belt extending from the Orange mountains, through Newark and Jersey City, across New York Island to Long Island. It is important to record this fact, for the reason that it accounts for the extinction of street lamps, in this case at least, when, if it were not for the well-established fact of the atmospheric disturbance, it would have been very difficult to do so.

Garnet as a Substitute for Emery.—In the township of Bethel, Delaware county, Penn., there occur considerable quantities of a garnet rock—a rather unusual occurrence. This rock is now mined by a firm of this city (Herman Behr & Co.), and prepared in various marketable forms as a substitute for emery. As the garnet approaches topaz, which ranks next to corundum in the scale of hardness, it is not unlikely that a massive variety of this mineral should be as hard or even harder than some grades of emery. We are informed that the firm engaged in this enterprise grinds the rock and prepares the powder of various grades of fineness, attaches it to paper and cloth, and produces cutting wheels of it, by some procedure similar to that employed in making emery-wheels. We may give a more detailed account of this industry in the future.

The Human Retina.—In a recent note to the Vienna Academy, Herr Salzer offers an estimate (based on numeration) of the probable number of optic nerve fibers and of retinal cones in a human eye. The number of the former he supposes to be about 438,000, that of the latter 3,360,000. This gives seven or eight cones for each nerve fiber, supposing all fibers of the optic nerves to be connected with cones, and equally distributed among them.

The Microscope in Botany.

The microscope is constantly enlarging its field of usefulness, and is adding, day by day, new triumphs in the direction of original research. It has recently given to the world a new and more certain mode for determining the geological structure of rocks; and the fact is now announced of a discovery of equal importance in connection with the life and growth of plants. As, in the first case, many of the universally accepted theories of geologists were brushed aside, so, in the present instance, theories which botanists had supposed to be well established are completely overthrown. It appears that Prof. Prinzheim, of Berlin, has recently been studying the green coloring matter in the leaves of plants, known as chlorophyl, and the cells in which it is contained. Botanists have heretofore assigned to this substance the work of absorbing from the atmosphere, during the night, carbonic acid gas, retaining the carbon for the sustenance and growth of the plant, and returning the free oxygen to the air to make good the deterioration of that element through the respiration of the animal creation. Now Prof. Prinzheim has demonstrated, by the aid of the microscope, that chlorophyl does not perform that work, but that the carbon in the atmosphere is appropriated and assimilated through the medium of a balsam-like substance in the plant, heretofore unknown, to which he gives the name hypochlorins. This newly discovered substance, when under the influence of sunlight, has a strong affinity for carbonic acid; and it further appears that the heretofore supposed active chlorophyl is merely a passive agent—a sort of curtain, screening the hypochlorine from the direct or too powerful influence of the sun's rays, so that it may do its work with regularity and moderation. The Prof. has shown, by experiments, that if the intensity of the sun's rays is materially increased by any optical apparatus, the chlorophyl screen or regulator, is found too feeble to protect the hypochlorine in its proper work, and oxidation sets in so rapidly that both chlorophyl and hypochlorine are rendered inert, and the plant dies. This discovery opens an entirely new field for botanical research, and furnishes additional evidence that plants have a regulator of vital forces, corresponding more nearly than the simple chlorophyl to the heart and lungs of animals, and further proof is gained in the direction of a unity of life between the animal and vegetable kingdoms.

The Energy of Cyclonean Forces.—In discussing the two cyclones which visited the Bay of Bengal in October, 1876, Mr. Elliott, meteorological reporter to the government of Bengal, incidentally gives some idea of the cyclonean forces which are developed by such storms. The average "daily evaporation" registered by the Bengal instruments in October is "two inches." The amount of heat absorbed by the conversion of this amount of water daily over so large an area as the Bay of Bengal is enormous. "Roughly estimated," says Mr. Elliott, "it is equal to the continuous working power of 300,000 steam engines of 1,000 horse power." A simple calculation will show that it suffices to raise aloft over 45,000 cubic ft. of water every 24 hours from every square mile of the bosom of the bay, and transport it to the clouds which overhang it. When we extend the calculation from a single square mile to the area of the whole Indian gulf, the mind is lost in the effort to conceive the force which, in a day's time, can lift 50,000,000 tons. Yet it would be easy to show that such figures, fabulous as they seem, do not adequately represent the cyclonic forces of a single storm.

The Circulation of Human Blood made Visible.—Dr. C. Huter, a German microscopist, has constructed a simple device by which the circulation of the blood is made visible in a human subject. His method is as follows: The head of the subject is placed in a frame, with which is also connected a microscope. The head and instrument are so placed that the lower lip may be slightly drawn out, and its inner portion fixed uppermost upon the stage of the microscope. A strong light is then thrown upon the surface of the lip, the light being intensified by use of a condenser. Thus arranged, the instrument is properly focused upon a small superficial blood-vessel, when the observer may plainly see the endless procession of blood corpuscles passing through the minute capillaries, the colorless ones being distinctly identified as little white specs, more or less thickly dotting the main body of the red stream of blood. This device may often prove of considerable importance to the medical practitioner, by enabling him to carefully note the variations in the blood flow, and the relative proportions of the white corpuscles in that fluid. This is the first instance where the flow of the vital fluid of one human being has been made visible to another. Observations as to the character of the blood have heretofore been made upon that fluid after it has been drawn from the subject, and, of course, under circumstances very unfavorable for accurate determinations.

Three blow-flies with their descendants will devour the body of a dead horse as quickly as will a lion.—*Linnæus.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 5.		Week Ending June 12.		Week Ending June 19.		Week Ending June 24.	
Alpha	6¼	5¼	6	4¾	6	5¼	5¼	5
Alta	2.70	2.40	2¼	2	2.40	2.05	2¼	1.85
Andes	95c	75c	80c	75c	80c	65c	90c	80c
Alpe	....	....	....	....	....	....	....	....
Argenta	45c	20c	50c	45c	55c	40c	45c	40c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	50c	30c	55c	35c	35c	30c
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	3.15	2.70	2¼	2	2.30	2.10	2.20	2
Belmont	25c	....	15c	....	....	....	15c	10c
Best & Belcher	11	10	9¼	8¼	9¼	8¼	8¼	8
Bullion	3	2¼	2¼	2	2¼	2	1.90	1.35
Bechtel	1¼	1¼	1¼	1¼	1¼	1.10	1.15	1
Belle Isle	50c	....	45c	....	60c	40c	50c	....
Bodie	8¼	8	7¾	7	8	6¾	7¼	6¾
Benton	1.60	1.45	1.30	1	1.30	1.05	1.15	1
Bulwer	6	5¼	5¼	5	5	4.90	5¾	5¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	65c	60c	80c	75c	90c	80c	80c	65c
Belvidere	2¾	2¼	3¼	2¾	2.80	2.60	3.05	2¼
Booker	40c	35c	60c	30c	75c	60c	50c	40c
Caledonia	40c	25c	80c	60c	70c	60c	60c	50c
California	2.20	2	2.15	2	2.20	2	2.10	2
Challenge	1¼	....	1.45	....	1.05	1	1.10	1
Chollar	4	3.30	3¾	3.15	3.40	3.10	3.15	2.80
Confidence	5¾	5¼	5¼	5	....	....	4¾	4
Con Imperial	850	30c	40c	35c	40c	35c	35c	30c
Con Virginia	3.45	3	3.35	3.10	3.45	3.15	3.30	3.20
Crown Point	1.95	1¼	1.90	1.35	2	1¼	1.80	1.65
Con Washoe	....	....	....	....	....	....	....	....
Champion	70c	60c	1¼	65c	1.20	85c	95c	75c
Concordia	60c	45c	85c	60c	90c	75c	75c	60c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	80c	60c	75c	55c	60c	....	60c	55c
Eureka Con	18¾	17¼	19¼	18¾	19¾	18¼	18¾	17¼
Exchequer	2¼	2.10	2.10	1¼	2	1.90	1¼	1¼
Endremedi	....	....	....	....	....	....	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1	90c	1.10	95c	1.05	1	1¼	1
Gila	....	....	....	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	....	....	9c	....	10c	....
Goodshaw	1.05	76c	3¼	1.45	3.45	1.95	1.65	1.10
Gould & Curry	4.30	3.85	3.90	3¼	3.70	3.05	3.45	3.05
Hale & Norcross	4.20	3¼	3.60	3	4.55	3.35	4.10	3.65
Hillside	50c	....	75c	45c	75c	....	....	....
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	40c	....	....	....	45c	40c	50c	40c
Julia	65c	25c	35c	30c	75c	30c	70c	60c
Justice	85c	75c	75c	35c	50c	40c	75c	25c
Jackson	....	....	2	....	2½	....	2¼	....
Joe Staples	....	....	....	....	....	....	....	....
K K Con	4¼	....	4¼	....	....	....	....	....
Kentuck	2	....	2	....	2	1¾	....	....
Kossuth	....	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	10c	....	....	....
Lady Wash	35c	....	35c	30c	30c	25c	30c	25c
Leopard	....	....	....	....	....	....	....	....
Leviathan	....	....	25c	10c	....	....	20c	....
Leeds	....	....	....	....	....	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	30c	20c	50c	30c	50c	30c
Modoc	....	....	....	....	....	....	....	....
Manhattan	95c	....	....	....	1	....	1¼	1.05
Martin White	60c	50c	75c	65c	75c	....	65c	55c
McClinton	65c	40c	65c	50c	45c	35c	40c	25c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	10¼	7¾	9¾	8¼	8¾	8¼	8¼	7¾
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	45c	25c	30c	15c	25c	20c	20c	....
Northern Belle	11¾	10¼	12¾	12	12	11¼	11¾	10¼
New Coso	....	....	....	....	....	....	....	....
Navajo	20c	....	....	....	25c	20c	25c	20c
Occidental	1¼	1.35	1.40	1	1	90c	1	80c
Ophir	9⅝	8¾	8¼	6¾	7¼	6¾	7	6¼
Oriental	....	....	....	....	....	....	....	....
Overman	2.10	1.85	1.85	1.70	1¼	1.10	1.10	85c
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	....	....	....	....	....	....	....	....
Potosi	3	2.70	2.80	2¼	2.60	2.35	2.40	2
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	25c	....	25c	20c	20c	....	5c	....
Richer	....	....	20c	....	10c	....	10c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	3.55	3.15	3.20	2¾	3.20	2.70	2¾	2.40
Seg Belcher	8¼	8	....	....	8¼	....	7¾	....
Sierra Nevada	16¼	13	15¾	13	13½	13¼	13¼	10¾
Silver Hill	75c	65c	70c	55c	60c	55c	55c	35c
Silver King	5¼	....	5	4¾	5	4¾	5¼	5
Silver Prize	....	....	....	....	....	....	....	....
Sucor	....	....	....	....	....	....	....	....
Summit	1.85	1.60	2	1¼	2.10	1.90	1.90	1¼
Scorpion	2	1.60	1.65	1¼	1.70	1¼	1.55	1.35
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	30c	....	....	....	20c	....
South Standard	....	....	....	....	....	....	25c	15c
Star	....	....	....	....	....	....	....	....
St. Lonis	....	....	....	....	....	....	....	....
Syndicate	1	95c	1.05	90c	2	1	1	90c
Tioga Con	1.60	1	2	1¼	1¾	1.60	1¾	1.60
Tiptop	6¼	5¾	7	5¾	6¾	....	6¼	....
Trojan	....	....	....	....	....	....	....	....
Union Con	22¼	18	20¼	18¼	19⅜	18¾	19¼	17¾
Utah	12¾	8¾	11	9¼	10	9	9¼	8¾
Vermont Con	....	....	....	....	....	....	....	....
Ward	....	....	1.60	1¼	1.40	1.30	1¼	....
Wells Fargo	....	....	....	....	....	....	....	....
Woodville	....	....	....	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	6	5¾	6¼	5¾	6	5¾	5¾	5⅜

Sales at S. F. Stock Exchange.

Thursday A.M., June 24.

10	Alpha	5¼	
50	Alta	1.85	
855	Bullion	1.40@1.35	
100	Belcher	2.10	
360	Con Virginia	3¼@3.20	
40	California	2.05@2	
20	Crown Point	1.65	
25	Con Imperial	30c	
50	Caledonia	50c	
110	Challenge	1.10	
5	Confidence	1.40	
115	Exchequer	1.65	
270	Hale & Nor	4.10	
110	Julia	60c	
40	Justice	75c	
250	Lady Wash	30c	
50	Mexican	7¼@7¾	
100	Ophir	6¾@6⅝	
50	Overman	85c	
100	Occidental	1	
150	Potosi	2.05	
250	Quinn	2.30	
75	Savage	2.55	
150	Sierra Nevada	11¼@11	
200	Silver Hill	45c	
125	Scorpion	1.40@1¼	
30	Utah	8¾	
230	Union	18¼@18¾	
210	Yellow Jacket	5¾	

AFTERNOON SESSION.

350	Aurora	35@30c	
200	Addenda	1.70@1.65	
150	Belvidere	3.10@3.15	
130	Bulwer	5¾	
5	Bodie	6¾	
50	Booker	50c	
325	Boston	1.10@1.05	
100	Belmont	15c	
80	Belle Isle	50c	
20	C Pacific	2	
50	Caledonia (B H)	2¼	
200	Day	55c	
40	Dudley	50c	
680	E Mt Diablo	50c	
55	Eureka Con	17	
50	Grand Prize	1¼	
50	Golden Terra	10	
100	Hillside	60c	
400	Jupiter	1.80	
200	Modoc	20c	
135	Mono	4½@4¼	
60	Mt Diablo	12½	
100	McClinton	30c	
200	Mt Potosi	35c	
100	Mammoth	1.90	
140	Noonday	4.10@4	
100	N Noonday	4	
150	Northern Belle	10¾	
100	Navajo	25c	
60	Oro	2½	
50	Queen Bee	30c	
200	Syndicate	75c	
125	S Standard	25c	
90	Summit	1.80@1.85	
100	S Bulwer	90c	
200	S Noonday	1.15	
100	Tioga Con	1.60	
50	Tiptop	6¾	
1500	University	30c	

GOLD dust is being brought to Oroville in large quantities from the mountains. The large amount of melting snow piled up in the mountains will make an abundance of water for the miners.

AT Port-au-Prince American silver is now at a premium of 7% and 8%.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	12	1 00	May 12	June 16	July 7	W Willis	309 Montgomery st
Atlanta M Co	Utah	1	05	Jan 2	June 24	July 19	A F McGrew	420 Montgomery st
Atlas M Co	Utah	1	20	May 19	June 23	July 14	A F McGrew	420 Montgomery st
Bechtel Con M Co	California	5	25	June 12	July 20	Aug 9	W H Lent	309 Montgomery st
Booker Con M Co	California	5	20	May 10	June 15	July 7	W H Lent	309 Montgomery st
Bullion M Co	Nevada	15	1 00	June 2	July 7	July 27	J M Brazell	328 Montgomery st
Caledonia M Co	Nevada	31	50	May 4	June 8	June 28	R Wegener	414 California st
Con Imperial M Co	Nevada	11	10	May 5	June 8	June 28	W E Dean	203 Bush st
Concordia M Co	California	3	15	June 1	July 8	Aug 2	Wm J Taylor	310 Pine st
Crown Point M Co	Nevada	41	50	May 8	June 11	July 2	J Newlands	203 Bush st
Defiance G M Co	California	5	25	May 20	June 28	July 21	W H Lent	309 Montgomery st
East Mt Diablo M Co	Nevada	1	10	May 7	June 14	July 6	G W Fisher	324 Pine st
Fairfax M Co	Nevada	2	20	Apr 7	May 26	June 16	O C Miller	324 Pine st
Mt Potosi Con M Co	Nevada	3	2 50	May 11	June 14	July 6	E A Holmes	318 Pine st
Metallic M Co	Nevada	3	25	June 9	July 13	Aug 3	Wm Willis	309 Montgomery st
Mt Diablo M & M Co	Nevada	3	2 00	June 22	July 26	Aug 16	Chas N Shaw	408 California st
Hale & Norcross	Nevada	64	50	May 11	June 16	July 8	J F Lightener	309 Montgomery st
Julia Con M Co	Nevada	12	40	May 12	June 16	July 6	H A Charles	419 California st
Jupiter M Co	California	9	40	June 14	July 16	Aug 11	E C Masten	18 Nevada Block
Justice M Co	Nevada	32	50	May 22	June 26	July 19	R E Kelly	419 California st
Mexican G & S M Co	Nevada	11	1 00	Apr 28	June 1	June 21	O L McCoy	203 Bush st
Mammoth M Co	California	5	50	June 16	July 27	Aug 27	A W Rose, Jr.,	302 Montgomery st
New York M Co	Nevada	23	15	June 7	July 10	Aug 3	D L Thomas	327 Pine st
Ophir S M Co	Nevada	36	1 00	June 4	July 9	July 23	C L McCoy	309 Montgomery st
Overman S M Co	Nevada	46	50	June 10	July 16	Aug 6	Geo D Edwards	414 California st
Sierra Nevada S M Co	Nevada	61	1 00	June 22	July 27	Aug 16	E L Parker	300 Montgomery st
Phil Sheridan G & S M Co	Nevada	10	25	June 22	July 24	Aug 14	D L Thomas	327 Pine st
Red Cloud Con M Co	California	7	20	May 11	June 17	July 9	W J Taylor	310 Pine st
Utah S M Co	Nevada	30	2 00	Apr 28	June 2	June 22	G C Pratt	309 Montgomery st
University G M Co	California	6	12½	June 10	July 14	Aug 3	Wm L Oliver	328 Montgomery st
Yellow Jacket M Co	Nevada	37	1 00	May 5	June 5	July 7	M Otey	203 Bush st
Wells Fargo M Co	Nevada	14	10	May 26	June 28	July 19	A Colburn	318 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Argonaut M Co	Arizona	1	03	May 26	July 3	July 24	J Pentecost	702 Market st
Cumberland G & S M Co	Arizona	1	30	June 8	July 19	Aug 9	Jno H Griffiths	328 Montgomery st
Empire G & S M Co	California	2	10	June 4	July 7	July 26	Jno McGeoghegan	318 Pine st
Excelsior Deep Gravel M Co	California	10	10	Apr 21	May 24	June 15	D F Verdenal	327 Pine st
Gover M & M Co	California	42	20	May 5	June 21	July 14	W O Wilson	402 Front st
Highbridge S M Co	Nevada	1	30	June 23	July 26	Aug 17	J W Few	310 Pine st
Ivanpah Con M & M Co	California	2	17½	June 19	July 24	Aug 11	E J Friedlander	300 California st
Morgan M Co	California	6	50	May 14	June 21	July 15	J J Raphael	533 Kearny st
Monte Cristo Con M Co	California	3	10	May 26	July 5	Aug 5	Butler Burris	309 Montgomery st
Northern King M & M Co	Arizona	4	20	May 14	June 19	July 12	E A Holmes	310 Pine st
Original Keystone S M Co	Nevada	3	50	May 26	June 29	July 21	F E Luty	330 Pine st
Occidental Con G M Co	California	4	03	June 14	Aug 5	Aug 25	W T Smith	402 Montgomery st
Oro Blanco M Co	Arizona	1	20	May 3	June 7	June 28	W O Gould	220 Sansome st
Paris M Co	California	1	10	June 1	July 7	July 30	Wm J Taylor	310 Pine st
Red Hill H M & W Co	California	3	03	June 15	July 17	Aug 2	A B Paul	328 Montgomery st
Rocky Point M Co	California	3	05	May 29	June 28	July 19	T L Bibbins	314 Bush st
Swamp Angel G M Co	California	1	2 50	June 2	July 24	Aug 12	Chas W Badger	315 California st
Telfair M Co	Arizona	3	01	June 8	July 17	Aug 7	J Pentecost	702 Market st
Wide Awake D & M Co	Arizona	10	05	May 22	July 1	July 20	C Hildebrandt	232 Sutter st
Wyoming Coal M Co	Wyoming	2	3	April 21	June 10	July 10		
Wyoming & Dakota W Co	Dakota	2	1 00	May 6	June 16	June 30	T Widman	404 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Eagle S M Co	Nevada	J E Byrne	533 Kearny st	Annual	July 5
Kennedy M Co	———	A Wissel	210 California st	Annual	July 2
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 19

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Q M Co	California	W L Oliver	Safe Deposit Bldg	25	May 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	50	June 19
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	50	June 30
Idaho G M Co	California	C Meade	324 Pine st	2 00	Apr 9
Napa Quicksilver Con M Co	California	Wm W Parrish	330 Pine st	10	June 10
Natoma Water & M Co	California	———	———	2 00	Apr 5
Northern Belle M Co	Nevada	W Willis	309 Montgomery st	50	May 15
Ontario M Co	Utah	———	———	50	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	June 12
Seventy-six S M Co	Nevada	E F Stone	306 Pine st	03	May 24

The Mining Share Market.

The comatose condition of the mining share market continues and the transactions at the board have more the appearance of playing at selling shares than of actually selling them. Comstocks and Bodies, and the entire list, have been alike dull and unprofitable, and the business of the week has been unrelieved by a single spurt. If there was any action at all the tendenoy was downward. This depressed state of things is leading share-holders to consider the expense account of the Comstock mines, and various suggestions are made to reduce the cost of working. There is a report that the Minere' Union of Virginia City is in favor of putting men to work on levels above the Sutro tunnel to extract the low grade ore at the rate of $3 per day. This proposition is referred to in our "Letter from Virginia," published elsewhere, and seems at last to have received the approval of the miners. The important thing to be done now ie to ascertain the extent and locality of the alleged reserves of low-grade ore, and thus furnish trustworthy data on which to hase the proposed economy and possible profit.

As a contrast to the sluggish and unpromising share market, mining operations along the length and breadth of the field are active, systematic and generally prosperous; and whether ehares sell or not, the mines are likely to produce largely of gold, silver, copper and lead.

Bullion Shipments.*

Since our last issue, we have noticed the following bullion shipments:

Bodie, June 14, $8,013; Northern Belle, June 14, $6,201.48; June 16, $5,871.18; Bodie, June 21, $8,010; Standard, June 21, $40,327; Tombstone, for week ending June 19, $47,369; Salt Lake City per McCornick & Co., June 15, Brooks, 1 bar, Old Telegraph, 3 bars, Stormont, 4 hars; value $16,150; at per Union Express Co., June 21, Barbee & Walker, $1,795; at per Wells, Fargo & Co., June 21, Ontario, $4,485; Plumas M. & W. Co., per Sec'y, P. Cadwallader, for May, $9,447.67; from Tuscarora, Nev., first five months of 1880, $194,389.23; from Cornucopia, Nev., Leopard, per Wells, Fargo & Co., $9,524; total receipts at Salt Lake City, eince June 11, Wells, Fargo & Co., $20,107.95; McCornick & Co., $41,250; Union Pacific Expreee Co., $14,011.02; total, $75,368.97.

*Desiring to make our list of Bullion Shipmeuts as complete as possible, we will be thankful to receive from mining Superintendents and Secretaries notice of all bullion shipments from their respective mines.

LATEST FROM THE SKAGIT REGION.—A dispatch from Seattle, W. T., June 18th, eays 28 miners arrived on the steamship *Josephine* this morning from Skagit with supplies. The *Josephine* is now making weekly trips from this city to a town called Alma, located three miles above Portage City, and higher up the river than it was herctofore supposed that any steamer conld ascend with eafety. During the past week the water on Ruby creek has fallen four feet; there is still, however, too much water for euccessful sluicing. The Seattle Co. have a full set of sluices completed and are constructing a wing dam. They expect to be taking out gold about the middle of July. The Durly Co. are averaging about three dollars per day to the man, with rockers, on a bench claim. Several other claims are paying about in the same proportion. All are intending to put in eluices as soon as the water recedes sufficiently. The trail from Alma to the diggings will be completed in about 10 days. Pack trains are now running over a greater part of the distance. Some 2,000 claims so far have been located in companies, all of which are to be represented by the 1st of July.

WAUGAMANN'S DRY GOLD SAVER.—We were present, a few days since, at a trial of Waugamann's dry gold saver. About half a ton of gravel had been sent down from some claims near Oroville, which are now being worked by Chinamen with rockers, the water for the same being carried to the locality in buckets. The gravel was first put through a screen, which reduced it about one-half in bulk. The balance was put throngh the dry washer at the rate of about a ton an hour, or two tons per hour, as it was before ecreening. The work appeared to be well done, as no color was found in a pan full of tailings, which we saw carefully washed, although the amount of gold taken out hy the machine showed that the gravel was quite rich, even for a rocker. We hope to be ahle to give an illustrated descriptiou of this machine next week.

EXPLOSION OF POWDER WORKS.—On the morning of June 23d, a fire occurred in the mixing-house of the Vulcan Powder Co.'s works, near San Pablo. A elight explosion followed which destroyed the small building, but did no more serious damage. At the time of the explosion the house contained about 300 pounds of powder. Fortunately two men who were working in the mixing-house escaped without injury.

THE Nevada *Transcript* learns that steps are to be taken in that county to enforce the law requiring mining incorporations to post monthly statomonts of thcir affairs.

Death of a Pioneer.

B. F. Watkins, a native of Genesee county, N. Y., died near San Jose, May 6th, aged 57. He came to California in 1847, in search of health, for even in those early days California had a reputation afar off for ealubrious climate. He was among the first to engage in agriculture and fruit growing in Santa Clara valley. He began farming near Santa Clara in 1851, and in 1853 and 1854 planted out an orchard and vineyard, a business which he followed with more or less success until 1877, when failing health induced him to give it up. With a nature kind and gentle as a woman's, and charity as wide as the universe, he was God's noblest work—"an honest man." Although modest and retiring to an unusual degree, he leavee behind him in the hearts of his friends a place vacant that no other can fill, a picture on memory's wall that will never he taken down.

Thus do the pioneers one by one start on their onward journey, and soon there will not one be left to tell of the triale and triumphs of those early days, when our valley was one vast mustard field, with not a fence from San Francisco to Monterey, and no fruit or vegetables except at the few Missions.—*Communicated.*

HEAVY MACHINERY FOR ARIZONA.—Messrs. Rankin, Brayton & Co., of the Pacific Iron Works, in San Francisco, are constructing the machinery for the new mill of the Boston & Arizona Company, to be erected on the San Pedro river some 15 miles from the town of Benson. This is to be a 20-etamp eilver mill with all the latest improvements, and will undoubtedly be the most complete and effective reduction works in the Territory. The machinery is to be run with one of the celebrated Wheelock engines, rating at 200-horse power. This is said to be the most economical and perfect working engine the mechanical ingenuity of the world has yet produced, having taken the grand prize at the late Paris exhibition, in competition with more than 300 engines from the best builders in all parts of tho world. This engine is particularly adapted to Arizona on account of its great economy of fuel and ite simplicity of oonstruction. Messrs. Rankin, Brayton & Co. have also nnder contract a very powerful set of hoisting works for the Sunset mine of Tombstone, consisting of double engines, double drums and gearing, with a capacity to work to a depth of 1,200 ft. There will be the heaviest and most substantial set of worke of this character ever erected in the Territory. The very important developments lately made in the mine seem to the owners to justify the expense of such works and are evidence of the confidence felt in the permanency of our mines.—*Arizona Daily Citizen.*

THE YELLOW JACKET DISASTER.—On Friday, June 18th, a terrible disaster occurred at the Yellow Jacket mine at Gold Hill, Nev., by which six miners were almost instantly killed. It ie reported that the accident was caused by a carload of tools in the south compartment on the cage going up, and when within 40 ft. of the surface, it ie supposed that the drill caught the wall plate upon the car, and threw the truck and tools over in to the next compartment north, where the men were in the bottom waiting to be taken to the top to eat lunch. The body of the car remained on the cage, and was jammed in against the wall plate. On the same cage was a car loaded with rock, and under the cage a bailing tank filled with water. The engineer thought something was wrong, and stopped the engine in time to prevent further disaster. Before the men were brought from the bottom, the news of the accident spread, and the works were thronged with men and women anxious to know the particulars, and whether their friende were living or dead. The sight when the dead were laid out in the changing-room and the wounded in the bath-room, and men and women gathered around, eome weeping teare of anguish over the dead, and others crying for joy over the living, was most affecting. The names of the dead are: Neil Gallagher, —— Whitcomb, Alfred Temby, Timothy Wilkins, Hannibal Williame, and John Trezona. Two men were also slightly hurt.

POSTMASTERS' SALARIES.—The increase and reduction of the salaries of postmasters in Nevada and Oregon, at the offices specified, are as follows: Nevada—Austin, $2,000, an increase of $200; Carson City, $2,600, an increase of $200; Elko, $1,600; Eureka, $2,500, a reduction of $200; Gold Hill, $2,500, a reduction of $200; Hamilton, $1,600, an increase of $100; Pioche, $1,600, a reduction of $200; Reno, $2,100, a reduction of $100; Tuscarora, $2,100; Virginia, $2,800; Winnemucca, $1,500, an increase of $200. Oregon—Albany, $2,000, an increase of $300; Astoria, $1,800; Baker City, $1,100; Corvallis, $1,200, an increase of $100; Eugene City, $1,300, an increase of $100; Oregon City, $1,500, an increase of $100; Portland, $3,000, an increase of $400; Salem, $2,600; the Dalles, $1,800, an increase of $300.

THE Bald Monntain company, of Foreet City, have adopted a new method of working their mine, says the Downieville *Messenger*. Instead of hiring their work done by the day, a large portion of the hands are now working by the piece. For running the main tunnel $8.50 per ft. is paid. For each carload of gravel 60 to 80 cents is the price allowed. Some of those employed objected at first, bnt most of the men went to work on theee terme. It is said that fair wages can be made at these figures.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Rich Strike.—*Ledger*, June 19: W. A. Nevills recently struck a pocket of extraordinary richness in operating his gravel claim at Red hill, near Butte City. Out of a very small space he took $2,000. Large chunks of gold were met with, one worth $63, another $42, while pieces from $10 to $20 were very numerous. But the largest nugget taken from the claim—and indeed the largest obtained in Amador county, in gravel mining, for years—was picked up by Mrs. Nevills. It weighed 7½ ounces, and is valued at $142.

Water for the Zeile Mill.—The water supply for the Zeile mill is not sufficient to run the full number of stamps. It is now proposed to run a pipe from the reservoir on Mary's hill, beyond Jackson gate, right to the mill, a stretch over 2 miles, which will have to be piped the entire distance. A survey was made of this line on Monday, and it only needs Dr. Zeile's sanction to have the enterprise started at once.

Oleta Items.—Fize & Harris' quartz claim, 1½ miles north of town, is opening up splendidly. There are 2 shafts, the northern one is down 62 ft, and the southern shaft 23 ft. The ledge in the bottom of the deepest shaft is 8 ft in width. A pile of milling ore, estimated at 170 tons, lies on the dump, and a few valuation pieces it at about $8 to $9 per ton. S. H. Clark had 15 tons of ore crushed lately, which yielded $8.50 per ton. His shaft is 40 ft deep. The American Flat claim is being cleaned up. Judge Purlintou anticipates a very satisfactory output of bullion.

Important Sale.—A gentleman named Larned, of San Francisco, and J. C. Vivian, of New York, bought the hydraulic gravel claim of Patterson, situated at Indian diggings, 6 miles from Olota. They paid thsrefor $20,000 in cash. Messrs. Larned & Vivian are now in Gleta, and the machinery to operate the claim is daily passing to its destination.

Amador Queen.—*Sentinel*, June 16: Mr. James Morgan came up on the stags, Sunday, to give his personal attention to the Amador Queen. Drifting and crosscutting are being vigorously pushed forward, and the paying properties of the mine will probably be definitely settled within the next 90 days.

Pacific Co.—Work on the Pacific company's shaft, at Plymouth, is being vigorously pushed. All the men that can be worked to advantage are employed. This is intended to be the finest shaft in the State, and as the company has unlimited capital there is no doubt of the early completion of the work.

Amador King.—The tunnel at the Amador King has been run in about 80 ft and has struck a fine ledge, which is about 10 inches at the top and widens out to 3 ft. The tunnel will be run about 40 ft further when it will reach the shaft.

Mining Notes.—On Nicholas Hornberger's claim, 1½ miles east of Amador City, the shaft has been sunk 50 ft, and is going down 50 ft more. Mr. Hornberger reports the indications to be very favorable. A good strike is reported in the Etna, formerly the McKay mine.

Angels Camp.—The claims are all in full operation, and the chances are extremely favorable that they will remain so the balance of the season. We shall be able to report the biggest clean-ups ever made in Calaveras within the next month.

Volcano Items.—*Dispatch*, June 10: Mr. T. Gillick is now developing a good mine near town which promises to be second to none in the county in the way of richness. He has a shaft now down 25 ft, at which depth the ledge is 5 ft wide, and he has taken out some 40 or 50 tons of rock which will yield about $60 per ton. Mr. P. A. Clute also has a mine in process of development, near the Downs mine, which is yielding rock of fabulous richness—the free gold being plainly visible to the naked eye all through the ore. He has a shaft down about 60 ft, the ledge being at that depth from 1½ to 2½ ft in width. Work on the big tunnel is progressing. A shaft 150 ft deep has been sunk at the upper end, and the work of running the tunnel from there towards the lower end was commenced a few days ago.

Tellurium Mine.—This mine has stopped temporarily for the purpose of putting in a larger pump, the old one not being large enough to keep the mine clear of water. During the meantime the rock taken from the mine is being crushed at the Dane mill.

Amador Mine.—This mine is said to be yielding a large amount of unusually good rock now, and it is rumored that the company will put up a new 60-stamp mill next summer.

Mahoney Mine.—Work at the Mahoney mine is going ahead with a vim. The boiler is being reset and new hoisting works are being put up. The work of erecting a new mill will be commenced next week.

Bunker Hill.—This mine is now yielding some very fine-looking rock, and the future prospects of the mine are more encouraging than they have been for a year past.

Notes.—The Yellow Jacket mill has been stopped temporarily, for the purpose of putting in some new pipe and erecting new hoisting works. The South Spring Hill mine have got their new steam pump started to pumping out water, and it is said to work well. The Downs mine is looking well, probably better than ever before. Present indications point to an era of prosperity for Volcano in the near future.

BUTTE.

A Profitable Clean-up.—*Mercury*, June 16: O. P. Powers completed the clean-up of his very productive little hydraulic mine Friday, after a 2 months' run. For a month prior to the clean-up the chief had only been worked 6 hours a day. The gold obtained was cast into a brick at the bank Saturday, the value of which amounted to $7,900. There are many more pretentious mines in the State that do not pay one-quarter as well upon the capital invested.

Jackson M. Co.—*Record*, June 19: In conversation last evening with Mr. Gillenwater, Supt. of the Jackson mining company, we learned that the work upon the company's works is progressing rapidly. The saw mill will be started on Monday, and as soon as the lumber can be gotten out, the water will be brought into the claim. The company is very confident that the mine which it is about to open will be a success. Work has been much retarded by the heavy fall of snow, which rendered the road leading into Deer creek impassable until recently. When the water is brought in the company will give employment to at least 100 men.

Spring Valley.—Supt. Waldeyer is anxious to continue his present run until July 1st before stopping to clean up. He is pushing ahead with energy in splendid gravel, and confidently expects to make a better showing than the mine has ever made. In this we believe Waldeyer is right. How ever much stockholders may desire monthly dividends, they occasion a great deal of labor in taking up and repairing the sluice boxes.

Prospecting Party.—D. A. Friel, of New York, A. P. Mann, of Folsom, and R. Pendergrast, of San Francisco, were the members of a party of prospectors passing through town Wednesday on their way to Plumas and Lassen counties.

CALAVERAS.

Bonanza Clean-up.—*Chronicle*, June 19: One day this week we saw a portion of the gold obtained at the clean-up of the Bonanza hydraulic lately. There was a "swad" of the precious, we tell you. The part of it we saw—which was a mere bagatello in comparison to the entire clean-up—weighed $2,400.

Duryea Clean-up.—We learn that the work of cleaning up at the Duryea hydraulic is completed, and the fine result was satisfactory to the proprietor. Piping has been resumed, and the process of refilling the flume with amalgam is again in vogue.

Notes.—Nearly all the hydraulic claims in this vicinity are cleaning up. The clean-up at the Eureka is set at $25,000 at least, and we shall not be a particle surprised if some of the other claims exceed those figures. At the Mammoth no preparations for cleaning up are being made, the flume not being quite full of the precious metal yet. Brown & McSorley, Querel & Co., Jillson and other tunnel miners are as busy as bees, and are all gathering golden stores, too. General operations will be more active, however, especially among the hydraulicers, when the clean-ups are completed.

Whisky Slide Mill.—The work of putting up the mill on the Whisky Slide mine, Jesus Maria district, is being done just as fast as willing and competent hands can do it. We should not be surprised if the engineer would be able to blow his whistle on the Fourth of July.

Notes from Angels.—*Echo*, June 16: Judge Lindsay, while prospecting in a lot adjoining his garden, uncovered a quartz vein about 9½ ft wide that prospects well. It is no doubt a continuation of the Crystal lead, which was at one time the richest mine in this section. The Dolan & Cogswell mine is making a good showing. Only about 5 men are required to keep 10 stamps pounding. It is doubtful whether there is another mine in the State of the same extent that requires so little outlay to work it.

EL DORADO.

Main Trunk Canal.—*Democrat*, June 10: Mr. Gilson Hicks, foreman of the Main Trunk canal, informs us that the work of repairing the damage caused by last winter's storms is progressing much more rapidly than was anticipated a few weeks ago. The canal is now open and in good condition to Alder creek. The repairs above that point will not require a great length of time. For some weeks to come Alder creek will furnish all the water the canal will carry. The trouble has been from slides, loosened by saturation with water, and coming in from above. As the canal is provided with a great many sandgates, most of the slides are sluiced out. Taken altogether, however, this property has suffered much less than the large ditches north of us. It is worthy of mention that there is, and will be through the entire season, a demand for every drop of water the canal will carry.

Nagler Mine.—This mine is the property of the California W. & M. Co., and, we believe, is the most valuable gold mine in the State. The mine has been hydrauliced to a depth of from 40 to 70 ft, and some 400 ft wide by 600 ft long, on the surface, and more than $2,000,000 has been extracted from it. The whole extent of the mine is almost one mass of quartz seams, all abounding with gold, and their limits are yet unknown. A shaft, which has been put down 150 ft on one of the seams, shows a widening of the lode, 5 tons of the ore recently shipped below yielding $200 to the ton. The company is now about to put a 30-stamp mill on the ground. It is estimated that there are some 200,000 tons of rock piled up as tailings from the mine, which will pay handsomely for crushing.

Secret Mine.—Gabriel Werntz has sold this mine for $5,000. Werntz has been working on this ledge for 14 years, under all the disadvantages imaginable. It lies between the slate and granite, with 2 ledges, 1 on either wall, which are 20 ft apart. The matter between is porphyritic and all charged with gold. The rock is very rich in sulphurets, some of it assaying as high as $7,000 per ton.

Springfield Mine.—This mine (the old Church Union) is running steadily on the stopes. Sinking will soon be recommenced. This mine is the deepest now operating in the county, being down over 700 ft.

Mining Notes.—The E. D. W. & D. O. M. Co. is running the Weber, North Excelsior, Loomis and Pebble Hill mines steadily. The old Weber tunnel has reached the shaft in Coon Hollow. When the 2 are connected, systematic prospecting will be done. Work on the Texas Hill tunnel, which has been suspended for some time, is about to be resumed. The Griffith Con. is being worked right along, to the entire satisfaction of the proprietors, which is good enough. Perre Vignaut has a ledge, near the Gross mine, on which he has crosscut 13 ft through quartz showing gold all the way. The Hulhurd Bros. have struck a rich porphyry lead in the Spanish Hill district. Mason & Killough are repairing some broken flume near the head of their Silver Creek ditch, and will soon be running their mine night and day. At the Gross mine a drift is being run to determine the extent and value of the deposit. If satisfactory, more stamps will be added at once. In the Ringold the water has been lowered over 160 ft. When the bottom is reached the shaft will be thoroughly repaired, and prospecting proceeded with. The music of the Placerville quartz company and Gregon Ravine mills is only interrupted by the regular clean-ups. The Sheppard mine, some 4 miles southwest of Greenwood, is being prospected by Frank Leavitt. Three men are engaged in sinking a shaft on this mine.

INYO.

Beveridge District.—*Independent*, June 12: We have some samples of ore from a new discovery by Joseph Kelley and John R. Hughes, in Cove canyon, Beveridge district. The pieces are not represented as choice specimens, but average samples. The ore is of a solid, mineral character, stained slightly with iron and copper. Upon breaking open a piece the whole interior is spangled with fine and coarse gold. An ounce and a half, put through the ordinary horn-spooning test, produced an almost incredible display of gold. We are assured that it came from a fine vein, well formed and traceable for a considerable distance on the surface.

Gold Product.—On the authority of Ross Moore, a veteran prospector who has lately been investigating the gold belt in the Sierra west of Big Pine, we have it that the old mine now being worked by John Kelley is turning out quite rich. The arastra is kept at work with the labor of 1 man in the mine, and is turning out some $500 per month in gold.

MARIPOSA.

Yosemite Mine.—Hornitos Cor. *Gazette*, June 19: At present the company has 68 men employed; some are grading the mill site, some are getting out ore and some are repairing the Bear Creek water ditch. The grade for the mill will be completed this week, and they propose to have the mill crushing ore by the 1st of August. It will be the finest mill in the county. The Supt. wrote to the Pres. of the company to-day that he could keep a 40-stamp mill in ore from the mine. The work is being pushed forward night and day.

Notes.—The Indian Gulch mill is being built by the same company as the No. 9. It is to be a 10-stamp mill. The Washington is going ahead as usual and without interruption.

MONO.

Spring Mining District.—Bodie *News*, June 16: This new mining district, lying about six miles east of Bodie, was organized last month. We learn several good ledges have been found that show rich silver chloride ore and free gold on the surface. The ledges are strong and from 5 to 20 ft wide.

Mammoth District.—*Herald*, June 16: The showing being made in the new workings of the Alpha mine is very encouraging. This is the first location made in the district, and a large amount of labor and money has been expended upon it. The rock from the immense croppings of the ledge has always given good assays. The new cut now being run is some distance south of the old tunnel, and an immense body of rich quartz has been encountered, from which assays of $210 have been made.

Merrimac.—This mine joins the True Blue on the south. Thomas McMahon and Jas. Doyle commenced work in the shaft yesterday morning. A shaft was sunk on this property to a depth of 40 ft last summer, showing a large and well-defined ore body.

Kenusha.—A rich gold strike was made on this mine a few weeks ago, and it now presents a fair showing of rock rich in free gold. Zach Taylor and Peter Simmes are hard at work. The ledge is daily improving in appearance.

Last Chance.—On Monday last two shifts were put to work on this mine. The water has entirely left the shaft, and sinking will be resumed. The prospects already encountered are very promising.

Big Bonanza.—Hank Rodgers, John Morales and two others resumed operations for the summer on the Big Bonanza, which lies to the southward of the Mammoth mine.

Notes.—Assessment work is being done on the Comstock and several south-enders, and we are informed that as soon as Chas. Radcliff arrives, active operations will commence on Rocky Cliff. An arastra will be built to work the rich ore and give it a thorough prospecting before the snow again flies. From North Fork, Laurel and other near surrounding mining camps news of the most encouraging character is daily heard.

NEVADA.

Murchie Mine.—*Herald*, June 19: Extensive improvements are being made at the Murchis mine. The company are about to expend $50,000 in various essential alterations. A new shaft of three compartments is now being sunk about 600 ft west of the old one. It will be furnished with a double cage track. There will be three air compressors used for hoisting purposes. A new 30-stamp mill is being built. A turbine water wheel is to be put in for the purpose of furnishing the motive power for the new shaft. This shaft is expected to be completed some time during October.

Sailor Flat Co.—This mining company at Quaker Hill stopped washing last week, owing to a failure of the free water supply. They commence drifting immediately, in order to develop the channel by that means if possible.

Mohican Mine.—I. M. Holcomb and Francis Burns have obtained a lease and bond of the Mohican quartz mine on Gold Flat, Reseigh & Co. who have within the past year taken some $4,000 or $5,000 from it, disposing of their right to these parties. The sinking of the incline will be continued to the 200 level, and it is the desire of the present holders to greatly increase the facilities for working.

Graphic Co.—The 10-stamp mill of the Graphic Co. was started Wednesday on a crushing of 400 tons on the dump and in the ore house, besides which a daily average of 10 tons of ore is being produced. In the upper level a pay chimney 175 ft in length, 70 ft in width and from 15 to 24 inches in thickness is reported to have been recently discovered. The south drift of the lower level is being pushed ahead to tap the pay chimney which is above. Work in the incline has been temporarily suspended.

PLACER.

Alabama Mine.—*Herald:* This mine is developing by a New York company. The main shaft is down about 200 ft, on a 3-ft ledge, and they are still sinking. They hoist by steam power, and all the appointments about the mine seem permanent and substantial. Regarding the paying qualities of the ore we learned that the last crushing was very satisfactory.

Chicago.—Less than half a mile from the Alabama is the Chicago quartz mine, which is being systematically developed. They are down 165 ft on a 2-ft ledge, and are still sinking. They have about 700 tons of milling ore on the dump, and are talking some of erecting a mill to crush it at some time in the near future.

Gold Leaf.—The main shaft on this ledge is down about 50 ft, and although the ledge is comparatively small, the ore thus far has been quite rich, averaging, we believe, fully $30 per ton. At present the owners are sinking a new shaft, with the view of a more thorough development of their valuable property.

Newcastle G. M. Co.—This fine gravel property was purchased by the present owners last January, and immediately on obtaining possession they set to work vigorously to fit it up for washing. To obtain sufficient pressure they conduct the water about two miles through 22-inch iron pipe. They commenced washing about the 10th of last month, and have kept a stream of 250 inches, through a 4-inch nozzle, playing against the bank nearly ever since. An experimental clean-up, after 10 days' run, it is generally understood, was very satisfactory. They have in their claim 120 acres of ground, on which the auriferous gravel deposits are extensive.

Laird Gravel Mine.—This is an old location, and a steady paying property. Various processes have been tried to secure the gold in this claim, with varied success. The last, and, we believe, the most successful, is the Cranston hydraulic, by means of which the water from the pipe, together with the washed gravel, is virtually raised out of a hole, or, in other words, made to run up hill. Hydraulic pressure tears down the bank, and the water and washed gravel running down into a sink for the purpose, is by further hydraulic pressure carried up through a pipe and the whole mass dumped into the tailings sluice. At present the mine gives employment to some 8 men, and yields, we believe, in gross, from $1,200 to $1,500 per month.

Sacramento Gravel Co.—This, from what we can gather, is a very rich claim. Operations at present are confined to washing over a pile of tailings on the ground of the company in Pennsylvania ravine, which, we learned from Mr. Jas. Klees, paid quite well. Their main reliance, however, consists in drifting. They have a tunnel from Pennsylvania ravine into the adjoining gravel hill, and have been fortunate enough to strike the channel, which is very rich. For want of drain, they have worked it but little yet, though as far as developed they often got gravel that paid from $1 to $5 to the pan, and one pan of dirt from this channel has paid as much as $20.

Southern Cross.—Dutch Flat *Forum*, June 10: On Sunday quits a blast was set off in the Southern Cross mine, just above town, which shook up the town pretty lively and loosened up a large portion of the bank so that washing may be pushed along more expeditiously. The blast contained 250 kegs of powder. Work is progressing lively in this mine.

PLUMAS.

Southern Eureka.—Greenville Cor. Plumas *National*, June 19: A large force of men are employed opening up the mine in good shape. Work is being prosecuted in tunnel No. 2, and it has cut through a ledge of quartz 12 ft thick from wall to wall, and it looks splendidly. A contract has been let for a lower tunnel, No. 3, which will tap the ledge 300 ft below the surface. Work is being pushed ahead in this new tunnel, and it will be completed as rapidly as possible. The superintendent intends this for a working tunnel, and the ore for milling will pass through it. The company propose to erect a large mill, which will stand about 150 ft from the mouth of the tunnel, and the cars will drop directly into the mill, the ore only having to be handled once. The quartz can be mined and milled at very small cost.

Bell Mine.—*National*, June 19: On Wednesday last the workmen in the lower tunnel of the Bell mine, struck some wonderfully rich quartz, and it is thought that they will open a bonanza. We were shown a specimen of it which is worth looking at, being full of free gold, and a much better character of rock than we have over seen from the mine. The strike has not been developed to an extent to tell what it is, but it certainly looks very promising, and ought to be a big one.

Prattville Notes.—Cor. *National*, June 17: The water is in on Dutch hill, and the prospects for an abundant yield of the golden harvest are better than ever before, both in the drifts and the hydraulic mine.

Gravel Claims.—Through Deputy Assessor Dean we learn that our newly acquired Alaska gravel range was, on the 6th inst., covered with snow to the depth of 16 ft. This insures the miners there the best water season they ever had, and the prospects for a big clean-up are most encouraging, and they well deserve their good chances, the two principal claims, Judge Lott's and the Morrison claim-mates, having expended about $30,000, and without any adequate returns thus far.

SIERRA.

Gold Bullion Mine.—*Mountain Messenger*, June 19: The owners of the Gold Bullion, on Kanaka creek, intend to purchase several Frue concentrators, so as to save more sulphurets than they now do with their present concentrators.

Notes.—Murphy & Co. are rigging up a derrick to work their claim on the East Fork. Judging from the expense they are going to they must have a good prospect. Work is temporarily suspended on the Savage placer tunnel, on account of some misunderstanding of the men with the contractor. The Extension company made 36 ft of tunnel last week in hard cement. Jerry Norton is tearing away the bank on Pigeou Hole at a lively rate.

TRINITY.

Taylor Flat Mine.—*Journal*, June 19: We have been informed that everything would be ready and hydraulicing commenced last Tuesday morning at the Taylor Flat mine. The company has been to an immense expense bringing on water and fitting the mine for work. We learn that the ground prospects exceedingly well and certainly hope that it may pay fully up to the expectations of the owners. The enterprise displayed and capital invested deserve large reward.

Water Ditch.—A party of 4 men own a valuable water right on New river. They brought the water on a bar at the outlet of Devil's canyon last summer. They have been ground sluicing that bar, but their bedrock being too low, they had to leave it till late in summer, when water is low enough to drain the claim. Now they are extending their water down some ½ or ¾ of a mile further to what is called Sailor's bar. They carry their water through a ditch and flume 2x4 ft, with good grade, giving them between 1,500 and 1,800 inches of water, and as Sailor bar prospects well they feel confident that they will have a good thing as soon as the water is through.

TUOLUMNE.

Bonanza Mine.—*Independent*, June 19: It is rumored that the Bonanza claim of Clark, Bray and Divoll is again taking out big money; that one of the partners one night last week was seen packing a sack on his shoulder containing 75 lbs of bullion; and that on Wednesday they took out $15,000, at the little mill of Seeber's where they are now crushing some rock. Since the big strike last year of $275,000, the mine has been closed, until a few weeks ago, when they commenced taking out a save and the water. This was accomplished very recently; one of the party remarking a few days ago that they had more left in sight than had already been taken out.

NEVADA.

WASHOE DISTRICT.

Bullion.—Gold Hill *News*, June 23: The drift from the incline toward the Bullion Combination shaft and on the 2450 level is making about 40 ft per week through a very fine and promising formation of quartz giving average assays of from $10 to $12. The drift to meet it and running from the 2200 station of the Bullion Combination shaft is making 35 ft per week through a similar formation of about equal value with that mentioned above.

Ophir.—Still running north on the 2500 level and from the main east drift on that level. The material is a heavy and promising vein formation. The joint Mexican crosscut east on this level is also running ahead and looking well.

Union Shaft.—The work of placing the foundation for the 2500 pump is not completed nor is the station cut out yet. The latter work will in a day or two be sufficiently advanced to admit of the starting of the drift which is to connect this station with that on the 2500 level of the Sierra Nevada incline.

Sierra Nevada.—The west drift on the 2300 level toward the perpendicular of the main shaft has been extended 200 ft from the main north lateral drift and has not yet reached the west wall of the vein from which a raiss is to be made to the shaft at the 1700 level.

Con. Virginia.—The south drift on the 2300 level, to connect with the winze when continued on down, is making usual progress. The stopes continue their usual yield of milling ore.

Caledonia.—The work of extending the drift north on the 2300 level, to connect with the drift run south from the Ophir line, has been resumed.

Yellow Jacket.—The sump has been carried down 25 ft below the 3000 level, and a drift to the east to increase its capacity is now running. The drift on the 2828 level toward the Crown Point workings on its 3000 level has attained a length of 250 ft.

Utah.—Still sinking the incline below the 1950 level, and through hard rock, and at the rate of 15 ft per week. The southwest drift, 1750 level, has attained a total length of 527 ft, and is without change of material. The west crosscut on this level is in fine vein material and is making good progress.

I X L DISTRICT.

Prospects.—Eureka *Sentinel*, June 19: Mr. John Cavert, one of the pioneer prospectors of I X L district, is in town, having arrived 2 days ago. He brought with him some fine samples of ore. The new camp, he says, needs money, not men. There is no chance for men who go there seeking employment for wages only. Prospectors who have means to support themselves may secure desirable properties and will be welcomed, but there is no employment for other classes. The camp needs furnaces and capitalists to purchase and develop promising prospects. The population of I X L numbers about 25 men.

OREGON.

Jackson County.—*Oregon Sentinel*, June 16: Silas Draper, of Foot's Creek, gives a very flattering prospect of the clean-up in that district. He says a much larger amount of gold dust will be taken out than usual and that the miners, generally, are very well satisfied with their winter's work.

Willow Springs.—*Democratic Times*, June 18: Egan & Co. are down about 50 ft on their ledge in Willow Springs district, and the quartz is improving. John Egan showed us some ore taken out at that depth that was full of gold.

Baker County.—*Bedrock Democrat*, June 16: Mr. William Ooos has bought John Schmidt's ¼ interest in the St. John mine, the late discovery, situated 3 miles north of the Virtue mine. This mine is very rich, and the proprietors are losing no time in developing it; they are going right down on the ledge and are at the present time 20 ft deep with the shaft. The ore is as rich now as when first struck, and gold can be plainly seen in almost every piece of ore taken from the ledge. Mr. Ooos is now one of the chief owners in this ledge.

Note.—Hayes & Co., owners of a quartz ledge at Pocahontas, 10 miles west of Baker City, in 2 months pounded out $20,000 in a hand mortar.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Lick Paper Co.—Object: To manufacture, import, buy and sell paper, and to carry on the business in all its branches. Capital, $100,000. Directors—A. D. Remington, P. H. McCormick, F. N. Delaney, C. P. Westcott and E. C. Locke.

French Zouaves' Mutual Relief Society.—Object: To assist members in distress. Trustees—Henry Bacquill, Francois Trebois, J. Jullien, J. Desberatts, Jean Pierre Daunet, Leon Borel, Joseph Pellison, Felix Candau and Barthelemy Mendiondou.

Golden Age Mill Co.—Object: To mill and sell grain. Capital, $60,000. Directors—A. Weske, P. A. Campbell, James Dunn, John R. Dunn and George Edmunds.

San Francisco G. & S. M. Co.—Location: Esmeralda county, Nev. Directors—L. T. Lazare, J. S. Fornald, W. C. Bousfield, E. J. Friedlander and S. I. Frank.

Weissbein Bros. & Co.'s Broking & Business Co.—Location: Grass Valley, Cal. Capital, $20,000. Directors—Jacob Heyman, Joseph Weissbein, Wm. Goldberg, Jacob Weisshein and Martz Hendelsohn.

Santa Clara Petroleum Co.—Place of business: Santa Clara. Capital, $1,000,000. Directors—Martin Corcoran, C. W. Upton, J. R. Crandall, F. P. Hennessy and Alonzo Dillshaugh.

The Green Monster Copper, Gold and Silver mining company, and the Hackmen's Protective and Benevolent Association, were granted articles of dissolution June 9th.

The Ocean Depths.

Dr. Carpenter, the Englisb physicist, has recently published in the *Nineteenth Century* some remarkable resnlts of bis elaborate studies of the latest deep sea explorations. The work of tbe scientific circumnavigation expedition in tbe *Challenger*, though completed in 1876, has not until within a few months, if even now, been fully reduced, and some of its most important discoveries are now announced by Dr. Carnenter, its originator. One of the first questions its labors contribute to solve is the depth and configuration of the ocean basins. The prevailing notion of the sea beds, Dr. Carpenter shows, needs considerable modificetion, none of them baving been carefully outlined, except that of tbe north Atlantic when sounded with a view to laying the first Atlantic cable. "The form of the depressed area which lodges the water of the deep ocean," he says, "is rather to be likened to that of a flat waiter or tea-tray, surrounded by an elevated and steeply sloping rim, than to that of the 'hasin' with which it is commonly compared;" and he adds, "the great continental pletforms usually rise very abruptly from tbe margins of tbe real oceanic depressed areas." The average depth of the ocean floors is now ascertained to be about 13,000 ft. As tbe average hight of the entire land mass of the globe above sea level is about 1,000 ft., and the sea area about two and three-quarter times that of the land, it follows that the total volume of ocean water is 36 times that of the land above the sea level.

These deductions, seemingly nnimportant except to tbe votary of science, are destined perhaps to serve the highest practical pnrposes of future deep-sea telegraphy. The intelligence now quarried out of tbe enormous collection of later ocean researches shows the modern engineer and capitalist the feasibility of depositing a telegraphic cable over almost any part of the ocean floor, and ought to give new confidence in the euccess of all sucb enterprises properly devised and equipped. When it is remembered that at the beginning of this century La Place, the great mathematician, calculated or assumed the average depth of tbe ocean at four miles (or 8,000 ft. more than Dr. Carpenter determines it to be from actual surveys), and that La Place's conclusion was the received view among scientists until 1850, or later, we get eome idea of tbe advance made in this branch of terrestrial pbysics by modern research.

Not less interesting is a deduction Dr. Carpenter makes from tbe deep sea temperature observations in the nortb Atlantic. In consequence of tbe evaporation produced by the long exposure of the equatorial Atlantic current, its water contains such an excess of salt, as, in epite of its high temperature, to be specifically beavier than tbe colder overflows whicb reach tbe equator from tbe opposite Arctic and Antarctic basins; and consequently it subetitutes itself by gravitation for the colder water to a deptb of several bundred fatboms. "Tbus it conveys the solar heat downward in such a manner as to make the nortb Atlantic between tbe parallels of 20° and 40° a great reservoir of warmtb." The climatic effect of tbis vertical transfer of equatorial heat is obvious. If the great heat-bearing currents wbicb enter the nortb Atlantic traversed its bosom as surface currents they would expend their warmtb largely in the high latitudes. But, as their beavy and highly beated volumes in large measure descend to tbe deeper strata south of the 40tb parallel, their stores of tropical temperature are permanently arrested off our eastern coast and ultimately made eubservient to our climate.

Mining at the Far North.—An expedition of 20 miners, escorted by a sailing launcb from tbe United States sbip *Jamestown*, left Sitka for the Cbilkute river on May 20th, witb six months' supplies. The intention of the party is to prospect for placer diggings on the Yukon river and tributaries. Tbey arrived at Chilcat on May 26th, and had a consultation witb tbe Indians tbere, wbom tbey found disposed to be friendly, which was, perbaps, owing to tbe fact that the expedition was escorted by tbree officers and 16 men from the *Jamestown*, under command of Lieut. E. P. McClellan, with instructions to enforce permissiou for them to enter tbeir country, which had beretofore been alwaye refused. The expedition was eminently successful, tbe head cbief Kluckutz, expressing friendly feelings, and promising future aid. The launch returned to Sitka on tbe 5tb inst.

Great Advantages of Mining.—If only a dollar in bullion is obtained for tbe dollar expended in the search, remarks the *Idaho World*, tbere are two dollars in specie where there was one before; aud if it be true, as it is said, that he wbo makes two blades of grass grow wbere only one grew before is a benefactor of his race, then how mnch more of a benefactor is he wbo doubles the quantity of gold and silver in the world. The search for hidden treasure is as legitimate and as praiseworthy as any of the industriee of life. Any legislation that discriminates against tbe business is unjust, and sbould he discountenanced. Gold is tbe life current of commerce. There is no danger that tbe stock will be too large. So long as it remains the medium of exchange between one part of the country and another, and between one nation and another, it will he well to encourage every effort to increase tbe home eupply, and thus strengthen the foundations of finance and trade.

The Mystery of Exchange.

We presume that most of our readers are aware that the qnotation of foreign exchange represents a premium considerahly in excess of the actual fact; hut we doubt whether all of them know precisely what is the difference. By the usage of bankers, the old Spanish dollar is assumed as the par of exchange, £1 sterling heing equal to 4 4-9 of these dollars. In point of fact, however, in the established moneys of Great Britain and the United States, £1 sterling contained es mucb gold as $4.87 of U. S. money; and this is tbe true par of exchange or rate which must be used in converting the money of one country into that of anotber. For instance, if anything costs £100 in Great Britain, its true value expressed in the money of the United Stetes is $487. Accordingly, it is a fact, familiar to all bankers, tbat wben exchange is quoted at 109½, there is no real premium, hut the true par has been attained; because, if we multiply $4.44 4-9, which is the nominal par, by 109½, which is then the quoted rate, we get $4.87, wbicb is the true par. We need scarcely add that it is owing to tbis circumstance that the exports of gold from the United Statee are not larger. If there really existed such a heavy premium on hills of exchange, as many persons suppose, it would be immensely profitahle to export gold to Great Britain. In point of fact, in view of the necessary expeneee of freigbt, insurance, and loss of interest, the margin does not more than cover the risk. The U. S. half-eagle, it may be added, contains 116 grains of pure gold, equivalent to $5; the British sovereign, or pound sterling, 113 grains, equivalent to $4.87 of United States money.—*The Economist.*

A Fossil Bed.—Recently says the Bodie *Free Press*, while a man was digging a ditch on the east side of the hill, near the Dudley hoisting works, preparatory to sluicing for gold, he struck qnite a deposit of fossils about four ft. from the surface. The first piece found was the perfect imitation of an ordinary frog. It was covered with soft clay on one side and the other side of the frog adhered to a solid piece of rock. About two ft. from this a flat stone was picked up, on one side of which was the plain outline of a fern. It was so perfect tbat the delicate hair lines of the leaves could be plainly seen. Tbe third discovery resembled somewhat the fern, and the original might possibly bave been a clover leaf. Digging a little further, quite a quantity of gold was wasbed out. The man says that his weekly clean-up amounted to abont $18.

Increase of Suicide in Europe.—According to certain statistics collected hy the director of an asylum for drunkards in Germany, says the *Pall Mall Gazette*, the number of suicides has of late increased in every country in Europe, save in Norway only. In Norway there have been on an average 9% fewer cases of suicide during the last 10 years than in the preceding 10 years—a fact whicb is attributed by the German writer to the etringent regulations against drunkenness in force tbere. In most German countries the number of casee of suicide has increased by from 90% to 100%. For eacb million of inhabitants there are now on an average every year in Saxony 300 cases of suicide; in Denmark, 280; in Wurtemhurg, 180; in Mecklenhurg, 167; in Baden, 156; in Prussia, 133; in Austria, 122; in Bavaria, 103; in Sweden, 81; in Belgium, 73, and in Norway, 40.

A Great Engineering Work to be Delayed.—A difficulty bas supervened in the construction of the St. Gothard tunnel, wbich threatens to seriously retard its completion. In tbe part of it wbere the formation is of porous white stone, the vaulting bas already given way two or tbree times, and it has required the greatest care and constant etaying witb timber to prevent the passage thereahouts from completely collapsing. In tbe opinion of tbe geologist of tbe tunnel, it can he overcome only by making a wide curve, eo as to get round the white etone instead of going through it. This would involve tbe entire reconstruction of that part of the tunnel, in whicb case, probahly, it will not be ready for traffic before the time fixed for the completion of tbe lines of approacb —two years hence.

Heavy Mining Suit.—Tbe Merrifield M. Co., says the Nevada City *Transcript*, June 17tb, bas begun suit in the Superior Court againet the Providence M. Co., whose property adjoins tbe former's claim on tbe sonth, Deer creek heing tbe dividing line. The suit is for $56,000 damages and to recover a certain portion of tbe ledge at their respective lines; also to procure a temporary injunction to restrain the Providence from extracting any more ore from tbe portion of tbe ledge in dispute. The Providence incline has a deptb of about 1,000 ft., and the Merrifield about 800. The plaintiff claims tbat the defendant bas for some time past been extracting large quantities of ore from its ground. The trouble bas been brewing for more than a year past, and has at times developed some very hitter phases.

The *Register-Call*, Central City, Col., June 9tb, says that tbe amount of hullion sbipped hy tbe respective banking houses of tbie city from tbe 1st of January, 1880, to tbe 2nd of June, foots up tbe snm of $525,000. The shipments were made throngb the express office of this city.

The Preservation of Railroad Ties in Germany.

Herr Funk, a prominent railroad official of Germany, has, in a paper contributed to a technical periodical, given the results of experience made witb the preservation of railroad ties in Germany, where various systems are very widely used. He has found, in the course of his investigations, that the average life of unimpregneted ties on the German and Austrian railroads has been as follows up to the present time.

	Years.
For oak ties	13 6
For fir ties	7.2
For pine ties	5.1
For beech ties	3.0

The average life of ties impregnated in a rational manner, witb creosote or chloride of zinc under a powerful pressure, reaches:

	Years.
For oak ties	19.5
For fir ties	14 to 16
For pine tics	8 to 10
For beech ties	15 to 18

The average life of 831,341 pine ties on 13 German railroads, impregnated on various systems, is calculated at 14.0 years. The plan of eimply steeping the ties cold in tbe impregnated fluid, or warming them or boiling them therein, has been abandoned hy most of the roads formerly practicing it, owing to the nnsatisfactory results, and the system of impregnating under a strong pressure is heing universally adopted. A few roads steep their ties in corrosive eublimate without pressure and are satisfied with the result. The employment of blue vitriol for impregnation is being more and more abandoned in favor of chloride of zinc, hecause the result is not so satisfactory, which may be owing to the fact that only steeping—or, at most, a weak hydrostatic pressure—is employed for impregnation, and an expensive copper tank is required for the purpose. The material itself is almost four times as expensive as chloride of zinc, while tbe results of impregnation with the latter and creosote are about equal. But as the impregnation witb creosote costs about three times as much as with chloride of zinc, a majority of the German railroads have gone over to the latter.

New Tunnel Project.—It is proposed to tunnel the St. Lawrence river at Montreal. An engineer has tbe matter in hand, so far as surveys are concerned, and a syndicate is on the eve of formation to apply for a charter witb a capital of $1,000,000 and horrowing powers up to $3,000,000. The tunnel will be sufficiently broad to accommodate a double track. The horing will, it is expected, he through the snbstance known as hlack rock, and, should the geological surveys previously made hy the government prove to be correct, tbere will be no more difficult subetance to contend with. The cost is roughly estimated at $3,000,000, and is less than a substantial bridge could he built for. The tunnel, it is claimed, is the only hope of tbe north ehore roads and the connection of the projected Toronto and Ottawa line, and gives a connection at Longueuil witb all roads leading to Portland, Boston and other Eastern points of tidewater independent of tbe Grand Trunk.

A Far-Off Silver Lode.—We learn from the Chico *Record* that B. F. Butler, living at Lovelocks, is building a hoat 30 ft. long, 6 ft. heam and 3 ft. deep, in wbicb he proposes to go to Central America, in search of a silver lode that be discovered in 1849. When this tiny craft is finished sbe will be taken to the Sacramento river, launched and fitted for the voyage. At present the blocks are done, and he is now forging the anchors. Tbis ie not the first experience of Mr. Butler in venturesome voyages, for in 1849 he went from Mineral Point, Wis., to Central America, in a 20-ton boat, and while exploring that country be discovered a silver lode of great valne. He has already made up a party of 15 prospectors, wbo are to go with bim and assist in developing it.

Precious Metal Resources of the U. S.—The New York *Shipping and Commercial List* of June 3d says that the precious metals are cropping out in many hitherto unsuspected localities in the United States. Aside from the principal mines in tbe Rocky Mountain and Sierra Nevada ranges, rich silver mines are heing worked in tbe Frenchman's Bay district of Maine, and ore in paying quantities bas lately been found in the Sicily Islands, near Ouacbita. Louisiana, and on the Red river, in the same State. The mineral wealtb of the country passes all comprehension.

Cheap Mining.—It would appear tbat mining is done cheaply under favorable conditions in distant Arizona. A Tucson correepondent of tbe San Francisco *Post*, writes June 8th: At Ogilly etation, 15 miles from Tucson, is a quartz mine. The ore is mined in the mountains, 3 miles away, for 75 cents per ton, hauled to the railroad by 12-mule teams for $1 per ton, and taken to tbe mill, 10 miles by rail, for 50 cents more. So it costs $2.25 per ton to get ore from the mine to the mill, which there produces $30 to tbe ton, tbus paying a very good profit.

The Colton *Semi-Tropic*, June 12tb, says: Robert Connell this morning exhibited to us a little bar of gold valued $443.32. Tbis gold is from the Black Mesa mine, in Black Canyon district, and was taken out by arastra process.

The placer mines of Los Angeles county have produced more gold the past winter tban during any three seasons previous.

Giants in Muskingum County, Ohio.

A correspondent of the Cincinnati *Enquirer*, in describing the mound in whicb the remarkable discovery of tbe gigantic skeletons were made, says it was about 64 ft. long and 35 ft. wide, top measurement, and gently sloped down to the hill where it wes situated. A number of stumps of trees were found on tbe slope, standing in two rows, and on the top of the mound were an oak and a hickory stump, all of whicb hore marks of great age. All tbe skeletone were found on a level with the hill, and abont eigbt ft. from the top of the mound. Now to a more particular description of these antiquated remains:

In one grave there were two skeletons—one male and one female. The female face wae looking downward, the male being immediately on top, with the face looking upward. The male skeleton measured nine ft. in length, and the female eight ft.

In another grave were also found two skeletons—male and female—with the female face looking upward and the male face looking downward. The male frame in this cese wae nine ft. four incbes in length, and the female eight ft.

In another grave was found a female skeleton, which was incased in a clay coffin, holding in her arms the frail skeleton of a child three ft. and a half long, by the side of which was an image, which, upon being expoeed to the atmosphere, crumhled rapidly.

The remaining seven were found in single graves, and lying on their eides. The emallest of the seven was nine ft. in length, and the largest ten. One single circumstance connected with this discovery was the fact that not a single tootb was found in either mouth, except in the one incased in the clay coffin.

On the south end of the mound was erected a stone altar, four ft. and a half wide and 12 ft. long, built on an earthen foundation nearly four ft. high, having in the middle two large flagstones, upon which sacrifices were undoubtedly made, for upon tbem were fonnd charred bones, cinders and ashes. This was covered by about three ft. of earth. This excavation was made under tbe direction of the Muskingum County Historical Society, and the things alluded to in this letter, or dispatch, can be verified by a number of witnessee who were present and watched the work as it progressed. It was pursued with great interest and diligence, tbere heing tbe etrongest incentive to prosecute the investigation, for sucb remarkable developments in mound-opening are very rare, and are therefore fascinating in tbe extreme. Their future lahors were also rewarded witb additional developments, which, if they do not throw additional light upon this giant race of people that once inhahited tbis country, will at least stimulate research.

What is now a profound myetery, the result of this excavation may in time become the key to unlock still further mysteries that centuries ago were commonplace affairs. I refer to a stone tbat was found resting against the bead of tbe clay coffin above described. It is an irregular-sbaped red eandstone, weighing about 18 lbs., heing strongly impregnated witb oxide of iron, and bearing upon one side two lines of hieroglyphics.

Recent Decisions Relating to Patents, etc.

We give below brief abstracts of decisions* rendered upon patent cases in litigation, for the benefit of our readers:

DECISIONS OF THE U. S. COURTS.

Day vs. Combination Rubber Co.

U. S Circuit Court, Southern District of New York.—Decided May 3, 1880; Wheeler, J.:

1. Letters patent No. 61,172, to Thomas B. De Forest, dated Jan. 15, 1867, construed and sustained.

2. Decisions rendered in former cases, and introduced to prove that the patentee under whom the defendants claim title made the invention before the plaintiff's assignor, cannot act as estoppels, except in cases arising between the same parties or privies to them.

3. A patent will be construed in the light of uncontradicted testimony as to prior existing devices for the purpose of determining its scope.

4. The entire description in a patent, as well as the name given to the subject of invention, is to be looked at in order to give effect to every part and to ascertain from the whole what is meant.

A decree entered establishing tbe validity of the patent and the infringement of the defendants, and for an injunction and an account accordingly, with costs.

Babcock et al. vs. Judd et al.

U. S. Circuit Court, District of Connecticut.—Filed Feb 23, 1880; Shipman, J.:

1. Letters patent granted to F. Babcock, Sept. 29, 1868, for an improved window-sash holder, construed and sustained.

2. A claim to a combination of old elements will not be so broadly construed as to embrace a similar combination in which one of such old elements is omitted and an element performing a like office, hut which is of a substantially different construction and which was new at the date of the patent, is employed.

3. Had such elements not been novel at the date of the patent, its substitution in the combination would have been simply the substitution of one well-known equivalent for another, and the change would have been but formal.

Decree entered for an injunction and an accounting with costs.

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* More complete reports of the proceedings may be found on file in the office of the Mining and Scientific Press Patent Agency, 202 Sansome street, S. F.

The Chicago mine, near Igo, Shasta county, has about 200 tons of ore in the dump that assaye from $275 to $355 per ton. They bave just struck a hody of richer ore than tbis, and tbeir etock bas risen in value 50 cents per share.

Where do the Precious Metals Go?

Where do the precious metals go? $234,000,000 of which are annually produced, is a question easily asked, and one that is easily answered. "*'Tis the clime of the east, the land of the sun*"—that parallelogram of the earth's surface included between the Red sea, the Himalaya mountains, the China sea and the Indian ocean, inhabited by nearly one-half of the human race, and among whom paper money is unknown—which has absorbed for centuries, and is still absorbing, more than three-fourths of the annual product of the precious metals. Rome, before the Christian era, imported carpets from Babylon, spices from Ceylon, silk (a pound of which was equal to a pound of gold) from Egypt and precious stones and aromatics from India. The balance of trade due to the East from the mistress of the world in the time of Augustus was $4,000,000 annually—a sum which must be regarded as enormous, taking into view that at that time the relative value of gold to silver was only one to nine; that the wages of labor and the prices of commodities were much lower than in our time; and that England and France were Roman provinces and inhabited by savage races who dwelt in huts and painted their bodies, as our North American Indians did seventeen centuries later, when the Puritans landed at Plymouth and the Cavaliers at Jamestown; when Germany was a land of forests, with a climate as cold as Canada in our time; and when Russia was a land of hogs and morasses, with its surface very little raised above the level of the Mediterrancan.

In our time all the countries of Europe, as well as the United States, are large consumers of coffee, tea, sugar, spices, silk, hemp, hides, dyestuffs, tin and other products of the East, which have to be paid for largely in gold and silver. The imports of the United States from countries beyond the Cape of Good Hope amount to $42,000,000 annually, while the exports amount to only $11,000,000. Great Britain and the other countries of Europe import annually from the East $160,000,000 more than they export to the same quarter. The exports of gold and silver from the United States during the last 31 years amount to $1,500,000,000, a sum greater than the amount of the precious metals in existence two centuries ago. The Arabians, Persians, Hindoos, Chinese and Japanese consume but little of the products of the Occident, while the products of the Orient are in great demand by the people of Europe and America. A French writer states that the Egyptians conceal $20,000,000 annually of the precious metals; and the Emperor of Morocco has filled 17 large chambers with gold and silver. The passion for hoarding is shared by the subjects of those princes. Silver pulpits and sacred ornaments of gold are very common in churches, temples, pagodas and tombs throughout the Eastern hemisphere.

The inscription which Dante in his imagination saw placed over the portals of the infernal regions, "*lasciate ogni speranza voi che 'ntrate,*" might very truthfully be transferred to the portals of the East. The solution of the problem of the disappearance of the precious metals from the countries where they are produced is *that the Orient is the reservoir into which continuously flows the gold and silver of the Occident*—a reservoir from which there is no ebb. It is with the precious metals as it is with our sweetmeats—we cannot have our cake and eat it too.—*The Economist.*

GOLD DISCOVERY IN NORTH RUSSIA.—Great excitement has been caused throughout the government of Archangel by the discovery of extensive new gold fields within a short distance of the town of Shenkoorsk. Measures have been taken by the imperial authorities of the far northern province for working the auriferous district this spring, and already applications have reached the powers that he at St. Petershurg from natives of Shenkoorsk for concessions and allotments, the land upon which gold has been discovered being almost exclusively an appanage of certain members of the imperial family. It is stated that the presence of gold in these regions, which are of a peculiarly sandy and sterile character, was first detected some years ago by a prisoner who had contrived to escape from Siberia, and who kept this a secret until last year, when he communicated it upon his death-hed to his brother, giving the latter an exact description of the locality in which rich treasures of gold-dust would be found.

IMPORTANCE OF CHEAP IRON.—The cost of iron and iron tools was a serious difficulty in mediæval husbandry. When iron implements were worth four cents a pound, that is to say at least 50 cents a pound in modern money values, the culture of the soil was superficial, and the fertility of the surface was rapidly exhausted. Before the middle of Elizaheth's reign the art of smelting cast iron was discovered, for a great deal of the Queen's heavy ordnance was made from this material. Nor is the price of wrought iron trehled, as that of most other commodities is. In the 15th century it was worth from $25 to $40 per ton; in the reign of Elizabeth from $50 to $70; for as the success of agriculture is a measure of the success with which other employments can be prosecuted, as well as a leisure class can he maintained, so the inventions of the mechanic materially assist the progress of the agricultural art and lessen the cost of its operation.

Useful Information.

NATURAL NICKEL-BRONZE.—The effect of the opening and working of the remarkable deposits of nickel (garnierite) in New Caledonia on the commercial value of this metal has already been to reduce the metal to about one-half the price at which it sold two or three years ago, and the doubt that has been expressed as to the extent of these deposits now appears to have been dissipated by the erection of extensive works, both in New Caledonia and near Marseilles, in France, for the crude reduction and subsequent refining of the metal, and the production from this source has been continually on the increase. These facts would appear to indicate that the original statements of the immensity of the New Caledonia deposits were not simply exaggerations. Another piece of evidence to the same end is now afforded by the formation of a French company, whose object is declared to be to effect the substitution of nickel-plated brass and copper by the use of solid *nickel-bronze*. This alloy contains nickel, together with various proportions of copper, zinc and tin, according to circumstances; but at least 20% of nickel is required to secure efficient protection against the action of the atmosphere and to give the desired tint. The *Journal of the Society of Arts*, referring to the new departure, states that all articles that are now made of brass or copper nickelized may be produced in solid white nickel-bronze. We take it for granted—though no special allusion to the fact is made—that the cost of the new alloy here referred to will interpose no obstacle to its general substitution for brass and copper.

A CURIOUS case came under the notice of the English inspectors of explosions of a quantity of honey which was imported into England in packages, bearing a label which, at first sight, conveyed the impression that they contained dynamite, and a good deal of alarm was excited, and the attention of the Lord Mayor was called to the circumstance that cases containing apparently a dangerous explosive were being conveyed about London. However, on investigation it appeared that the honey was in the comh, inside boxes, the tops and hottoms of which consisted of thin sheets of glass, and several of these were enclosed in a large outer package. It was, of conrse, necessary that the packages should be very carefully handled, and in order to secure this the importers had had recourse to the extraordinary device of placing upon each package the label: "Handle gently as dynamite. A drop of one inch will cause certain destruction to the contents." The words "handle gently," "dynamite" and "certain destruction" being printed in much more prominent type than the rest, the label presented the appearance described. As the use of a label of this sort did not constitute an offense against the explosives act, the inspectors did not further concern themselves in the matter.

RULES FOR FINDING HEATING SURFACES.—To find the heating surface of vertical tuhular boilers: Multiply the circumference of the fire box in inches by the hight above the grate in inches; multiply the combined circumference of all the tubes in inches by their length in inches, and to the sum of these two products add the area of the lower tubs or crown sheet. Divide by 144, and from the quotient suhtract the combined area of all the tubes, and the fire door. The remainder will be the number of square feet of heating surface. To find the heating surface of tubular hoilers: Multiply two-thirds of the circumference of the shell in inches hy its length in inches; multiply the combined circumference of all the tubes in inchss by their length in inches. Add to the sum of these products the area of both tuhe sheets and divide hy 144, and from the quotient suhtract twice the combined area of all the tubes. The remainder will be tho numher of square feet of heating surface.

EXTENSIVE FILTERING EXPERIMENT.—A filtering experiment on a large scale is about to he tried by a company in Holyoke, Mass., to ohtain pure watsr for washing purposes in the manufacture of paper. Quite near the mills is a piece of land lying lower than the canal, and this the company proposes to fill with water to the extent of about three acres. Pipes will conduct the water from the canal bank into a hed of gravel some eight ft. in thickness, through which it will pass, and it is expected that the filtering and the subsequent standing of the water in the reservoir will purify it sufficiently. The water will be ahout 10 ft. deep on an average, and will be pumped from a point about midway between the surface and the hottom. The experiment is a new one, and will be watched with interest.

A HOUSE MADE OF PAPER.—There is at the Sydney, Australia, exhibition a house huilt of paper. The entire furniture, including chandeliers and a stove, is of paper. So, too, are the carpets and curtains; and there is a hedroom in which there is not only a large paper hed, but also paper hlankets, sheets, quilts and female underclothing, dresses and honnets in the latest style. It is proposed to give a series of banquets in this huilding, at which the plates, dishes, knives, forks and drinking utensils shall be also of paper—everything, in fine, except the eatables.

A SHOWER OF RAILROAD SPIKES.—The great demand for railroad spikes has called into existence a remarkable machine, now in successful operation at the establishment of Dilworth, Porter & Co., Pittsburg. It is the invention of the late Mr. James Swett, and comprises a series of "continuous" rolls handling the material automatically. The material, in the form of hillets 2½ inches in diameter and 3½ ft. long, is taken in by the machine, and in 13 seconds reduced in diameter and increased in length to a rod 36 ft. long and 9-16 of an inch square. In 40 seconds more this rod has to be cut in two and passed through two spike machines, from which finished spikes shower at the rate of 40 tons every 10 working hours. By working "double time" five of these machines have turned out 1,100 kegs of railroad spikes per day, each keg containing 150 pounds, or 13 kegs to the ton. The product of ordinary rolls and machines is from 2 to 2½ tons of finished spikes per working day of 10 hours.

PHOTOGRAPHS THAT WINK.—The last new thing in photography surpasses the ingenuity of the man who invented the spirit photographs, and suggests how handy it would have been had that crafty person added this to his devices. A Frenchman takes one negative of a sitter with open eyes. Then he makes the sitter shut his eyes and remain in exactly the same position while another negative is taken. The two negatives are printed on the same paper, one on each side exactly coinciding. When this double-faced picture is held in proper position before a lamp, and the lamp is rapidly moved or caused to flicker, the curious effect is produced of long-continued winking. It is not claimed that a person looks more beautiful when he keeps winking, but it cannot he denied that it gives one a very interesting appearance.—*Philadelphia Record.*

Good Health.

Beware of Plasters and Salves.

Plasters and salves are more dangerous even than oil-silk or rubher overshoes, as they are usually applied to wounds and sores, and in many more cases produce harm than they do good, as they usually protract the cure, and often prevent it entirely. The cause is simply that plasters and salves are mostly water-proof, and therefore interfere with the natural function of the skin; if either of them is placed on a sound portion of the skin and kept there for a few days the skin becomes sore. Their application is often the cause of the difficulty in healing wounds. Scores of cases have come under our notice that our advice to dispense with the use of so-called healing salves caused a finger, which had been sore for months, and kept sore by the continual application of different kinds of salves, to heal rapidly as soon as the use of salves was discontinued.

It is the same with plasters; we have seen it over and over again, that a cut wound which had been covered with a plaster, to shut off the air, as a foolish prejudice teaches, had a most protracted and painful course, while a similar wound simply treated by bringing the edges together and covered with a piece of linen to keep it clean, healed in a few days. Thie keeping clean does not only mean to keep off dust and foreign substances, hut to clean off the dried hlood which may cover the cut. It is even often advisahle to put some hlood over the edges of the wound, after they have heen brought together with a few stitches or narrow cross-strips of plaster, which, however, must never he allowed to cover the wound. It should not he lost sight of that the skin is made for contact of air, and that this contact is necessary, not only to keep the skin in healthy condition, hut also when repairs are going on. Therefore no water-proof plaster should interfere. But hlood is soluble in water and absorbs air, and it bas great healing power; in fact, there is no healing salve so efficient as the blood which often covers a wound, and which therefore must not he interfered with hy any means. Under a dried crust of the blood repair goes on actively, as hlood contains all the elements required for such repair, and renewal of tissues wants the nourishing ingredients which are found in the blood.—*Practical American.*

LONGEVITY OF BRAIN WORKERS.—The great thinkers and hard hraiu workers are long-lived is asserted, with a considerahle array of facts, in a volume by Dr. Beard. He presents a list of some 500 of the most eminent names in history, including a number like Pascal, Mozart, Keats and others, who died young, and finds the average age of the 500 to have heen over 64 years. As this is far heyond the average age of farmers, mechanics and business men, he concludes that the wear and tear of hrain work is not so exhausting as is commonly supposed. The London *Spectator*, however, reviewing this theory, maintains that excessive mental toil must shorten life, and did evidently shorten it in the case of many of the 500 cited, hut they had originally more vigorous constitutions and a larger amount of vital force, and, hy virtue of this superior vitality which explains, in part, also, their superior hrain power, they were able to continue hard work even to old age, before breaking down under the pressure; though the same vital force would have prolonged life for many years if they had not exhausted it prematurely.

Biliousness.

Biliousness is a greater amount of bile in the blood than is natural; the result of which is, the eyes and the skin begin to wear a yellow appearance, while various other symptoms manifest themselves according to the temperament, habits and peculiarities of the individual; one has sick headache, another complains of a want of appetite, sometimes loathing the very appearance of food; a third has cold hands and feet; a fourth has chilly sensations involving the whole body, or running up and down the back; a fifth is costive, women become hysterical and laugh, cry or talk, while men are moody, peevish or morose. Bile is naturally of a bright yellow color, but as a man becomes more bilious, it grows darker and is at length as black as tar, causing a state of mind which the old Romans called atrability, "atra" meaning "black"; a scowl is on the countenance, and the person is illnatured and fretful, finding fault with everybody and everything; hence when a man is cross, he is bilious, and ought to be pitied and at the same time made to take an emetic. The illnatured are never well, they are "bilious," the system is clogged, the machinery does not work well and both mind and body are disordered.

The safest and best means of getting rid of biliousness is steady work in the open air, for 6 or 8 hours every day, working or exercising to the extent of keeping up a gentle moisture on the skin, this moisture conveys the hile away out of the system. The same result will be accomplished, hut not so well, by a good steam bath or by wrapping up in bed, drinking hot tea and thus "getting up a perspiration;" hut the atmosphere of the room should be pure, and the diet for several days should consist of coarse bread and fruits. Medicines whicb "act on the liver" will do the same thing, but they should he advised by the physician when other means have failed. The office of the liver is to withdraw the bils from the blood; it is the largest workshop of the body, and is at the right side about the lower edge of the ribs. When it does not do its work, it is said to be "torpid," asleep, and medicines are given to stimulate it, wake it up, make it act or work faster than common, so as to throw off the excess of bile. When it does not withdraw or separate the hile from the hlood, the skin grows yellow, also the whites of the eyes, and the man has the "yellow jaundice." When it separates the hile from the hlood, hut retains it within itself, constipation ensues, appetite is lost, spirits become despondent, and the person is languid, lazy, fretful and irritahle. The liver is in a sense like a sponge, and the bile may he pressed out of it, as water out of a sponge, by pressing the hall of the band over the region of the liver downwards, from hip to "pit of stomach," 2 or 3 minutes at a time, several times a day; this is a good remedy in dyspepsia, and also relieves the stomach of wind, giving immediate and grateful relief sometimes.—*Hall's Journal of Health.*

TO CURE FITS OF SNEEZING.—A correspondent of the *British Medical Journal* says: During the recent rapid changes of temperature I caught a severe cold in my head, accompanied by almost incessant sneezing. My unfortunate nose gave me no rest. The slighest impact of cold air, or passing from the outside air into a warm room, equally brougbt on a fit of sneezing. In vain I snuffed camphor and pulsatilla; the light catarrh still triumphed over me. At length I resolved to see what the maintenance of a uniform temperature would do toward diminishing the irritahility of my Schneiderian membrane, and accordingly I plugged my nostrils with cotton wool. The effect was instantaneous; I sneezed no more. Again and again I tested the efficacy of this simple remedy, always with the same result. However near I was to a sneeze, the introduction of the pledgets stopped it at once. Nor was there any inconvenience from their presence, making them sufficiently fine not to tickle, and yet leaving them sufficiently loose to easily hreathe through." This is really worth knowing, for incessant sneezing is among the greatest of smaller ills, and it seems only a rational conclusion to hope that this simple plan may furnish the most efficient remedy against one of the most distressing symptoms of hay fever.

TECHNICAL BREVITIES.—Sodium hicarhonate has lately been very successfully used as an application to hurns by spreading a layer of powdered salt over the hurnt part and surrounding it with a strip of moistened linen. When thus used, it at once relieves the pain and prevents the formation of blisters. Dr. Koller has tried for the same purposes repeated applications of glycerine, and reports that it is far superior to the bicarhonate in relieving the pain and preventing hlistering. It leaves the skin soft, while the hicarhonate has opposite tendency.

THE TREATMENT OF SPRAINS.—Mr. Dacre Fox, an English surgeon to a large railway company, who has had considerahle experience of this form of injury, says that in the more severe cases he finds that aftsr a few days of fomentation the hest treatment is regulated pressure, by means of carefully adjusted pads and large plasters of a special shape, varying according to the particular joint involved. By this plan he feels sure that it is possihle to control the effusion into the sheaths of the tendons and adjacent structures, to lessen the pain and to shorten the duration of treatment.

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The Week.

Volume XL of the MINING AND SCIENTIFIC PRESS closee with this week. A careful retrospect of the work brings both satisfaction and pleasure to the publishers, for it presents a careful digest of all the important facts relating to the great industries of the Pacific coast, and a valuable collation of scientific, mechanical and sanitary progress. As a book of reference the volume will he found indispensahle. We have from year to year made considerahle and interesting improvements, and it is our wieh and intention to present to our patrons a journal as nearly perfect as possihle in every department. The measure of our euccess, no less than our ambition to gratify our readers, will impel us to etrive to attain greater excellence.

The general report respecting the damaging effect of the northers on the wheat crop is more eatisfactory, and there is now a reasonable assurance of a fair yield of an average quality of wheat throughout tbe State. The hrighter prospecte are cheering, and lighten the lahore of the harvesters who are now fairly in the field.

Our mining regions continne to eend good reports of active and prosperous operations. It is noteworthy that the demand for mining machinery is brisk, and our macbine shops are husily engaged in filling orders for mills and other apparatus for near as well as remote eections.

Since our lest issue the Supreme Court of the State has rendered two important decisions; the first declaring the McClure charter unconstitutional and inoperative; and the second, that the capital etock of corporations is taxahle. U. S. Minister Angell and Commissioners Trescott and Swift have sailed for China; news hes heen received of the death at Washington of Gen. John A. Sutter; and the Democratic Convention at Cincinnati has nominated Gen. Hancock for President.

Work of the Drainage Commission.

The Board of Drainage Commissioners, the membors of which have inspired the fullest confidence in the people, has entered fairly upon the discharge of the responsihle duties imposed upon it. As the action of the Commissioners is destined to affect botb the welfare of communitiss and ths special intsrests of individuals, any plans which they may propose or adopt will havs an absorhing importance and should receive the fullest puhlicity. With this object in view we propose to keep our readers informed of every importent scheme undertaken hy the Board.

The large debris dam to he constructed on the Yuba river has received the special attention of the Commissioners who have examined hoth sides of the rivsr, and caused plans of the proposed dam to he drawn. We present from the Yuha City *Banner* a hrief outline of the plan, which shows that the dam is to be huilt from one hluff to another hluff on the opposite side of the river, distant some 5,000 ft., or nearly a mils, and the hight to he eventually over 40 ft. The hase of the dam is to hs ahout 100 ft. wide, and will he composed at first of small stones, ths size of the stones to he gradually increased as height is attained. Heavy stones are to hs placed on the lower side of the pile for the purpose of supporting it. Ths base of the dam will he so constructed as to allow the weter to percolate through it until the interstices are gradually filled, and hy that time the dam will he so high and huilt in so suhstantial a manner, and will be fortified, too, hy the long, sloping deposit which will extend back and up the river, that the water can flow over the top without at all endangering the structure. It is not believed that the dam will he huilt to a greater hight than 10 ft. during the present season, hut that hight will present a sufficient harrier to the descent of the debris. Immediately ahove the proposed site of the dam, there is a valley having an area of ahout four square miles, and it is alleged that the checking of the water hy the dam will cause all the sediment and debris held in suspension to spread over and settle in this gorge, and that a grade will form and extend hack and up the river for six miles, the upper end of which may be higher than the dam. The process of this formation will he similar to that hy which the elevated hed of the river has already heen formed, that is to say, hy the natural force of gravitation. It is estimated that when the dam is completed the river in a time of flood, and running across the entire upper surface, will not he more than one ft. deep, and that the pressure upon tbe dam from above, though great, will not he a eource of danger, hecause the new-formed and gradually sloping deposit, extending for miles ahove, will act as its own support.

IMPORTANT MINING DECISION.—The interesting case of the Iron against the Luella mine, says the Denver *Reporter*, which occupied the U. S. District Court recently, was decided after a short deliheration by the jury, in favor of the defendant. These two well-known Leadville mines lie together, and the Iron mine claimed that having the outcrop of its deposit it had a right to follow this deposit outside of its own lines, and hence that it owned the deposit which was disclosed hy the Luella shaft, as said deposit was simply a continuance of that in the Iron mine. The verdict settles the question that a deposit at no greater incline than those at Leadville cannot he followed outside of its own lines, and will he very generally approved there and throughout the State.

A GROUP OF RICH MINES.—The *Mining Review*, Col., contains an account of the mines of Ouray county, among which there is a group of remarkahly rich gold-hearing veins. It says the Sheridan is conceded to he the richest mine in the county, and has never yielded a lower return at mill than eight and one-half ounces to the ton, while a large percentage of the ore has given as high as 16 ounces of gold and considerahle eilver per ton. The Cimarron and the Pandora also yield largely of gold and eilver. Ore produced hy the N. W. H. Jr. mine, gave a mill yield—first class, $13,000 per ton; eecond class, $8,000 per ton; and the average of the ore exceeds $100 per ton.

POPULATION OF ALAMEDA COUNTY.—During the last decade there has heen a large percentage of increase in the population of Alameda county, ae the following list of ite cities and townehips will show: Oakland, 35,000; Alameda, 5,094; Brooklyn, 3,100; Murray, 3,050; Washington, 3,002; Eden, 3,662; Temescal, 2,548; Berkeley, 2,023; total, 58,990. In 1870 the population of the county was 24,237, and of the city of Oakland, 10,500.

GRAVEL BEDS IN SHASTA COUNTY.—There were reported recently valuable discoveries of gravel deposits in different parts of Shasta county, which, if they prove to be well founded, will revive the general interest of tbe county. In addition to the gravel heds there is said to have heen eome important finde of quartz veins. Iron and gold certainly ought to constitute a solid hasis for enduring prosperity, and Shasta's opportunity appeare to be at hand.

Academy of Sciences.

The regular semi-montbly meeting of the Academy of Sciences was held on Monday evening. Mr. C. Wolcott Brooks presided, in tbe absence of Prof. Davidson.

Several donations of fish were made to ths cabinst, including some received from B. B. Redding and Prof. Jordan. Among them wers some candle-fish, used as candles by the Indians. Tbese fish are found in Nevada, living in hot springs which issus from rocks nsar Honey Leke. An explanation of their development in so strange and isolated locality was offered hy Mr. Redding, and an extract read from the Reno *Gazette* treating of ths matter.

A Valuable Fiber.

Mr. B. B. Redding presented, on behalf of pertiss residing near the Mohave desert, specimens of a plant growing wild in that locality, used hy the Indians for making a strong description of cordage, the seeds of which they prepars for food, using the result as a species of pinols. The gentleman forwarding it to ths Academy, thought it could be grown in our State as a valuahle fiber, capahle of estahlishing a new industry for our people.

Dr. Kellogg thought it resembled a speciss of the *Salvia Columbaria*. He said it had a beautiful purplish hlue hlossom, and yields a large quantity of seeds, which may he successfully used as sye-stones, for, when inserted under the eye-lid, the moisture of the eye causes them to throw out a pleasant and delicate mucilage, which flows toward the corner of the eye, taking with it any foreign suhstance which it is desired to remove. Seeds put in water increese to five times their hulk. Similar seeds are found in Aztec graves, showing that in their daye the climate of this locality produced similar plants, whose valuahle qualities were known and availed of as food.

Dr. Kellogg, on hehalf of the committee appointed to report suggestions in regard to a botanical garden, asked further time, which was granted.

Certain Ice Forms.

Mr. P. S. Buckminster read a valuahle paper in continuation of a former one, on certaiu "ice forms," in which, after recounting the results of similar observations made hy Stephen Elliott, Sir John Herschell and Prof. John Le Conte, he cited a number of pertinent details which they had not attempted to account for. Some forms observed by Mr. Buckminster in mines, he described es made up of some hundreds of needles, associated in prismatic hundles, from a quarter of an inch to three-quarters inch in diameter.

In regard to the production of these ice forms, Mr. Buckminster concludes that the crystalline forms observed by him received their eupply of moisture at the earth's surface, where it was deposited hy gravity, the attraction of cohesion prohably exercising some influence, hut not heing a necessary adjunct. The water having exuded, congelation commenced and was continued at the hase of the forms through the force of crystellization transmitted through them, there existing and continuing such relative condition between the temperature and supply, that a viscous condition was maintained at the hase of the forms, which restrained them from falling and enahled their projection or growtb.

The conditions of the occurrence of similar formations upon plant eurfacee as observed hy Sir John Herschell and Prof. Le Conte, would indicate that there accumulates in some way, within the plant formed, a projectile force which forces the water out, and that it is congealed through direct contact with the air. A sudden contraction of the skin and woody shell of the plant was euggested as a possihle occurrence and reason, hut it was only offered as a suggestion. Mr. B. thought it possihle to realize the earth forms described hy Prof. Le Conte, hy accepting that the water is supplied through the agency of the force of cohesion, and huilt up hy the forces of crystallization, the force of congelation heing in thie case one of the forces. Particularly would this he possihle, if it should hereafter he determined, as he thought it would he, that these as well as those observed hy him are true natural crystalline forms.

Mr. Redding gave a very clear and interesting account of the experience of parties engaged in collecting and shipping ice from the Sierra Nevada. He said, when they had cut ice frozen in the mountain lakes at a low temperature to a thickness of two ft. or more, and removed it to ice-houses, that, if left lying flat in the position in which it had frozen, it always developed a tendency to disintegrate, and to separate into a mass of long, vertical and parallel crystals; while if etored on its edge, it kept much better, and usually without that drainage from melting which occurred inevitahly when stored in the other position.

Magnetic Influence on Cryetallization.

Mr. Brooks suggested the theory that electrical currents, acting vertically, were perhaps the active agents of nature in the organization of crystalline forms, and a different presentation of the structure to the current might arreet or change the peculiar action involved in these conditions. Mr. Buckminster stated that he was well satisfied that certain mineral crystals were continually forming in eome mines already worked out, and if the agent in one case of cryetallization was electric, he knew of no reason why tbe law ebould not bc general, and also apply to the formation of ice-crystals as well; hut that he was rather of the opinion that in crystallization there might exist a douhle and simultaneous action. He thought it quite likely that the six sided crystals of ice might hs huilt downward, from the hottom of ics, first crusting over a pond, and their crystals follow given lines of vertical magnetic currents, and thus huild down prismatic needls-like columns, packed closely together in hnndles, and forming by association, extensive fields of ice, in which case a change of its position might vary its immediate susceptihility to megnetic influence.

ACTIVITY IN MINING MACHINERY.—Tbat there is unusual activity in mining operations throughout the Pacific slope, the orders at our principal foundries and machine shops cleerly prove. The character of the work, too, indicates the thoroughness of the plant which various mining and reducing companies ars constructing. For exemple we will mention the following orders which have hesn received hy Messrs. Rankin, Brayton & Co., of the Pacifo Iron Works, the execution of which has grsatly pressed their large estahlishment: A 20-stamp silvsr mill for the Boston and Arizona company, at Tomhstone, Arizona; a 20-stamp mill and hoisting works for the Golden Eagls company, Glohe district, Arizona; a pan mill and roasting furnace for the Silver King mine, in Piual county, Arizona; a 40 hundred furnace for the El Dorado canyon mill, Arizona; a 60 hundred furnace for the Warsac mill, Utah; a 30-ton galena smelting furnace for the San Xavier company, and a 30-ton copper furnace for the Ajobo, hoth in Arizona, and a 10-stamp silver mill for Mexico. In addition to these special orders, the Pacific Iron Works, which has long made mining machinery a conspicuoue feature, has a large list of lesser ordere for apparatus, from mining and milling companies in various parts of the coast. Douhtless other foundries and shops in the city are fully as husy. The character of the machinery ordered implies the extent and value of tbe mining operations going forward in every State and Territory of the Pacific, and impele one to predict a large yield of the precious metals in sections hitherto unproductive and almost unknown. A hrief visit to the Pacific Iron Works, or any other of our spacious machine shops, will inspire the fullest confidence in our great mining industry.

THE MCCLURE CHARTER DECLARED INVALID. As was fairly anticipated hy every reflecting citizen, the Supreme Court has declared that the McClure charter, passed hy the late Legislature, is unconstitutional and inoperative. The decision of the Court, which was written hy Justice Myrick, is voluminous, and deals with the merits of the case in the fullest manner. The Court held that the city has the right to adopt its own charter, framed hy a Board of Freeholders or any other legally constituted hody of men; or that the Legislature can hy a general law frame a charter for all cities alike in the State. The decision of the Court is hased on Art. II, Sects. 6, 7, 8, of the new Constitution. It is a timely affirmation by our highest trihunal of the wholesome principle of local self-government, which was fast becoming ohsolete. "To us," says the Court, "the general intention to emancipate municipalities as far as it could consistently he done from the control of the Legislature is apparent; and we cannot hold that general lawe for the government of euch municipalities can take effect in any of them until a majority of the electors so determine without violating not only the epirit, hut, likewise, the plain letter of the Conetitution." The decision has removed all douht and uncertainty, and gives, we imagine, general satisfaction.

A REMARKABLE MINING SUIT.—Peter Grub sold his share in an iron mine at Cornwall, Pa., reserving the right to enter upon the premisee forever, and take therefrom sufficient ore for the supply of one furnace. That was almost 100 years ago when iron ore was smelted in a somewhat crude fashion, and the average yield of a furnace wae 1,500 tone a year. That was ahout the amount taken hy Mr. Gruh annually during his lifetime. But the process has heen vastly improved eince then, and now a furnace turns out as much in a single month. The question arose, of course, whether the heirs of Gruh were entitled to as much ore ae would supply an 18th or 19th century furnace. A lawsuit has heen in the courts for 24 years, employing some of the ahlest lawyers in the State. The Supreme Court has just decided on appeal, that ore can he taken in sufficient quantity to supply a furnace of the present time.

A RICH MINE IN FRESNO.—The Fresno *Republican*, of June 19tb, contains an interesting account of the important discovery of a rich gold-hearing ledge on Sycamore creek. The property is owned hy a San Francisco company. That paper says that the vein is 12 ft. wide, and no piece of rock fails to yield gold, when pulverized in a mortar and panned out. Thirteen assays have been made, giving $68 as the average value per ton. A shaft has heen sunk to a depth of 15 ft., and will he continued downward to a depth of 50 ft. as a test. Should the ore at that depth prove as valuahle as it ehows ahove, the company will speedily erect a fine mill and develop this most promising mine.

Scenes in the Yosemite Valley.

Our engraving gives a faint impression of some of the majestic objects in the Yosemite valley. The scene is in the canyon of the Merced river, which branches out an angle from the Yosemite valley proper. In the foregronnd is seen the trail leading np the Merced canyon, and which brings the visitor ere long to a near view of the wonders which are peculiar to this branch of the Yosemite. The trail rises rapidly and follows the course of the Merced river. So sharp is the ascent that in two miles an elevation is attained 2,000 ft. higher than the entrance to the canyon. In reaching the lower level the Merced river plunges over numerous cascades and makes two grand falls, which are among the greatest attractions of the Yosemite, according to Whitney, not only on account of their hight and the large body of water in the river during most of the season, but also on account of the stupendous scenery in the midst of which they are placed.

The first of these two grand cataracts is Vernal fall, which is shown in the center of the engraving. Whitney places the hight of this fall, at the average stage of the water in June and July, at 400 ft. The rock behind the fall is a perfectly square cut mass of granite extending across the canyon. The rock near the bottom of the fall is steeply inclined, so that a precise definition of the place, when the perpendicular part ceases, is very difficult amid the blinding spray and foam. Alongside of the headlong roaring stream from Vernal fall the trail leads up to the base of the fall from which the visitor may ascend by ladders. At the summit of the fall the view down the canyon, as well as in the opposite direction, is extremely fine. The system of ladders by which this summit is reached, in the winter time is covered by masses of icicles wonderful to behold. We are now engraving a winter view of the ladders, which will appear ere long.

Aloft in the sky, above the center of the engraving, is the "cap of liberty," a most notable object. It is a mass of rock, isolated, and nearly perpendicular on all sides, rising perhaps 2,000 ft. above its base. The cap of liberty has a striking resemblance to the object its name indicates. It is so marked that it is often recognized as it is viewed from various elevated points about the valley. It is an embodiment of grandeur, and its impress is firmly fixed upon the mind of the beholder.

The visitor who ascends the canyon of the Merced above Vernal fall meets something grand and impressive every time the view changes. About a mile from Vernal fall, but hidden from view by the lofty bluff in the engraving, is Nevada fall, which is pronounced by Whitney as in every respect one of the grandest waterfalls in the world, whether we consider its vertical hight, the purity and volume of the river which forms it, or the stupendous scenery by which it is environed.

BUYING MEXICAN MINES.—We learn that there is at the present time quite a large number of American prospectors, chiefly from this coast, both as agents and principals, engaged in search for mines in the of States of Sinaloa, Sonora and Chihuahua. The *Chronicle* says it has positive information that California and Eastern capitalists have recently invested in mining property in Sonora and Chihuahua to the extent of over $1,000,000. The title deeds and descriptions of the property are now being translated by the most competent expert in the city. No particulars of the transactions will be given to the press until absolute possession of the mines are taken. A Mexican journal states that ex-Governor Pesqueira of Sonora has sold his mining property for $250,000 to a party of American capitalists, but this sale does not include the purchases previously mentioned.

THE PECAN FOR CALIFORNIA.—Dr. Strentzel, from long observation, is convinced that the pecan is the nut tree for California. For two or three years in starting it requires good care, after which it will prove a hardy tree here. Its useful qualities for timber are similar to those of the hickory, to which family it belongs. Its wood is darker than hickory. It starts easily from seed, is naturally a rapid grower, and is a handsome street, shade and ornamental tree. It fruits in from 10 to 15 years. It takes kindly to this climate and invites cultivation.

CAPITAL STOCK TAXABLE. — In the suit brought by the city to collect taxes for the fiscal year 1876–7 from the Spring Valley water company, the Supreme Court on Tuesday rendered a decision in favor of the city. The effect of this decision is to make the capital stock of all corporations taxable. This year the assessments on capital stock will include the City Gas-light company, Spring Valley water company, the banks of California and Nevada, besides many lesser corporations.

MR. JOHN MUIR, the author and geologist, is spending a quiet summer with his happy bride and her father's family at Alhambra. He is writing leisurely for Eastern magazines, and has promised to favor Pacific coast readers in the pages of the *Californian*.

An Awakening in the Lumber Interest.

We note with pleasure that the better times which seemed creeping into the lumber interest of the coast last fall, have at last so asserted themselves that measures have already been taken for increasing production. Our magnificent timber resources and the vast amount of capital already enlisted in developing them, have undergone a long period of quiet, and the result has been depression and scarcity of funds in the lumber regions. A change was imperatively needed to bring these enterprises into the line along which most of our special industries are moving. Last fall there seemed a chance to move for a better order of things, and the lumbermen were awake to avail themselves of it. Then, however, it was more or less a prospective matter and the early spring demand was the test which should finally shape the industry. This fortunately was so favorable to a resumption of activity that nearly all the saw mills in California, especially on the northern coast, are now running on full time and turning out their full complement of material.

VIEW IN THE CANYON OF THE MERCED – YOSEMITE VALLEY.

The city trade is still light, and this may easily be accounted for by the fact that the influence of a prosperous year has not yet had time to exert itself in surplus funds in the hands of merchants, and by the other fact that there is small demand for new buildings, either for use or as an investment. In the country, however, there is considerable building activity prevailing, and calls for lumber are quite satisfactory to dealers. California redwood is being taken to Nevada and Arizona, and is preferred to the pine produced by local mills. This feature gives us an outlet which helps dispose of the large production which busy mills send forward. It is not expected that there will be anything of special profit in the business, nor that high prices will prevail. It will be better for the general advancement of the country that they should not. With prices fairly remunerative to lumber producers, but not excessive, much more material will come under the carpenters' tools than would under a high price list. The result will be a marked improvement in our buildings, and activity in the lumber districts. These two satisfactory conditions are both dependent upon a reasonable rate for the product of the mill.

The improvement in this market of course influences all lumber districts tributary thereto. A late dispatch from Seattle, W. T., says: "Seven Puget Sound saw-mills, representing an average capacity of 810,000 ft. of lumber per day, have resumed full time, which would indicate that the depression which so long has prostrated the lumber trade of that section, is about to be superseded by fresh prosperity, calling for a largely increased production of logs and manufactured lumber." Thus life at this center is calling forth activity in all the outlying producing districts. We hope all our readers will succeed so well in this year's labors that they can all make an investment in lumber for the improvement of their homes and farm buildings. There is no little satisfaction driving nails, especially when the lumber is paid for.

ARKANSAS SILVER MINES.—A correspondent of the *Engineering and Mining Journal*, writing from Silver City, Ark., gives an interesting account of silver mining at that place. He says what we believe will be news, indeed, to many people on this coast—that a great silver belt extends north and south 60 miles, and probably 100 miles east and west. The principal developments are, however, in the vicinity of Silver City. The outcrops are heavy and easily traced, generally taking a course north of east. A fact worthy of note is the number of veins. Right in the heart of the city there is a number of mines, one of which is yielding very fine ore, which is shipped to Galena to be smelted. The ore consists of galena, gray copper, brittle silver and chloride, and it is estimated that it will yield $500 per ton. But the silver fields only constitute a part of the mineral wealth of Arkansas. Through the counties of Polk, Pike, Sevier and Howard, immense outcrops of galena, iron and copper are found, besides the largest deposit of antimony in the known world; and last, there is gold—gold in the sands and in the quartz veins.

TIMBER-DESTROYING FUNGUS.—We learn from a letter by J. P. Moore, in the Healdsburg *Enterprise*, that he has found the timber-destroying fungus at work in the trees thereabouts. Mr. Moore says: "It attacks the living spruce (the *Abies Douglassii)* and it is *certain* death. It may be seen now on the apruces on the ridge just beyond the bridge west of Healdsburg, and is of yellowish color. It appears outwardly upon the bark as a shell-like looking protuberance, but its roots *(mycelium)* are deep within and run along under the bark, or penetrate the wood. Trees so attacked, in the no distant future, succumb. It is the *Dædalea vorax* (Harkness) and is a most interesting fungus." This fungus was fully described, with illustrations showing its method of operation, in the RURAL PRESS, January 25, 1879. We refer our readers in that region to their files of the RURAL for further points concerning the announcement made by Mr. Moore.

A NEW process for manufacturing paper from grass has lately been patented. The grass is used while green.

Letter From the Comstock.—No. 1.

EDITORS PRESS:—There is a general belief now existing in San Francisco that the mine managers of the Comstock are combining to crush out the Miners' Union. I hardly consider this to be the fact, and think it will not be hard to show that the Union itself is responsible for the hard times now existing. John Mackay is reported as having pronounced the *ultimatum* that the miners must work for $2 a day. This is incorrect. I have frequently heard him express the opinion that $4 was little enough for a man working in the lower levels. These are his words: "Whenever I see a man sweating in a heated drift for four dollars a day and a wood-cutter on top getting five, I feel that the two should change wages, for the miner certainly earns the most."

The Low-Grade Ores.

There is a proposition which has been discussed for some months regarding the taking out of low-grade ores above the Sutro tunnel level. It is suggested that a couple of thousand men be put to work taking out this ore for $3 a day; this would give work to the unemployed, and no man now receiving $4 at a greater depth would have his pay reduced. The Miners' Union refuse to accede to this proposition, on the grounds that there is no low-grade ore above the tunnel level. This is really no objection at all, for if the mine owners will put two thousand men at work taking out waste rock, it certainly cannot matter to the men employed what kind of ore is found so long as they get their $3 a day, whereas now they get nothing. The assertion that no low-grade ore can be found there is all humbug. It lies in large quantities in Savage and Gould & Curry on the 500 level and above the old tunnel level. In the Ophir there were hundreds of tons sent to the dump from the 600 level, assaying $25 a ton, and on certain levels of the Belcher and Crown Point there is any quantity of it stored away. At the time when it cost $25 a ton on the Comstock to reduce ore, everything below a $30 assay was cast aside, the mine owners only going for the pluma of the pudding. Col. Fair has repeatedly said that he would like to put a hundred men to work at $3 a day on the low-grade ore in the Occidental. If he only cleared 25 cents per ton he would like to keep the mill running and give men employment; yet the Miners' Union pronounce the fiat that these hundred men must walk the streets idle. In fact, there is hardly a mine on the Comstock which does not hold ore in the upper levels, which could not be worked at a slight profit with wages at $3, and some of them would produce enough bullion to relieve the coast of the heavy assessments now draining stockholders. Beside, there is plenty of unexplored ground in the localities named where bonanzas may lie.

At the North End.

The developments at the north end are not being kept back for the purpose of freezing stockholders or that election purposes may be secured. The managers are as anxious as anybody to see an ore body opened up, as they have millions staked upon the gamble. They have every confidence in the ultimate result, and are pushing explorations just as fast as the work now progressing at the Union shaft will let them. At present the boom is kept waiting simply because there is no regular ore body yet found. Rich places are encountered which give indication of being detached from the main mass, and, as progress is made north, the stringers and seams grow stronger, but no regularly defined body. Skae's old incline winze is down to the 2500, and the Union winze from the 2400 to the 2500 level is 160 feet south of the Sierra Nevada incline; a north drift is running east of the vein to the Sierra Nevada winze, and has 30 ft. to run to make the connection. Seams of ore are showing up on west side of this drift. Explorations are being made still further north, but with what results it is impossible to ascertain.

HARD DRILL.

MINES OF NEW MEXICO.—Prof. Silliman lectured recently at the Bullion Club, New York city, on the "Mines of New Mexico." The Prof. had just returned from a visit to that Territory. In the course of his lecture he stated that by turning the waters of the Rio Grande into a canal in northern New Mexico enough gravel can be washed out there to pay immense sums in rich gold for ages to come. He said that a company of capitalists was about to develop that part of New Mexico, and he had no doubt they would be bountifully rewarded. He estimated the value of 2,000 acres there at $240,000,000, and said it would take 300 years to exhaust that region. He said the only trouble there has been want of water. He also spoke of other remarkable deposits in New Mexico.

A GOLD DISTRICT.—We are informed by the Inyo *Independent*, that a party left Cerro Gordo recently for the purpose of starting up for the season the steam arastras at Beveridge district, where Hunter, Hughes & Co. have several big gold mines, each opened more than 100 ft. in depth. The extraordinarily rich, small strata worked by the Mexicans of the district produce from $1,000 to $2,500 per month, gold—the exact yield of bullion, but where it all goes to, is a mystery to outsiders. The yield from Taylor's works will show a handsome aggregate during the season.

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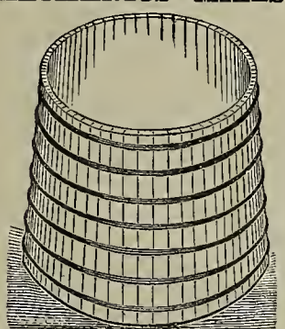
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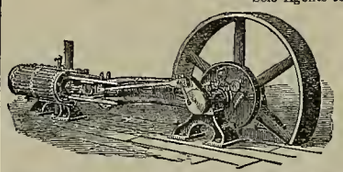
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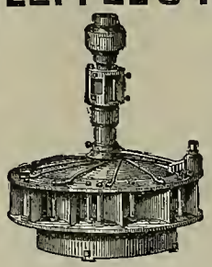
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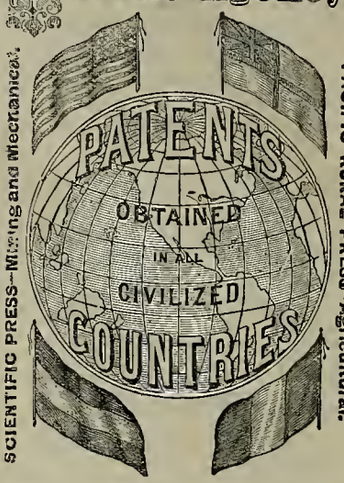

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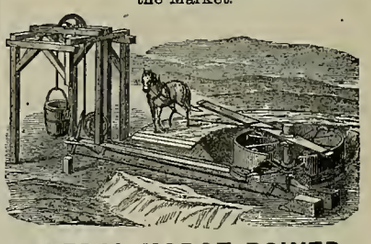
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A Card from Architects.

The California Architect and Building Review.

Office, No. 240 Montgomery Street, San Francisco, Cal.

It is with pleasure that we publish the following from prominent Architects in this city:
Believing that a journal of its kind is a necessity on this coast, and judging from what has appeared in the "Quarterly Architectural Review," we are led to believe that the CALIFORNIA ARCHITECT AND BUILDING REVIEW will be worthy of generous support and encouragement. We therefore pledge our cordial sympathies, personally, and hope that the enterprise will receive kindly recognition and liberal support from all Architects and Builders and the public generally. (Signed) David Farquharson, Wright & Sanders, S. H. Williams, Thos. J. Welsh, P. Huerne, John Marquis, B. McDougal & Son, Wm. Mooser, Wm. Curlett, Meeker & Banks, W. C. Hoagland, S. & J. Newsom, B. Henrickson.

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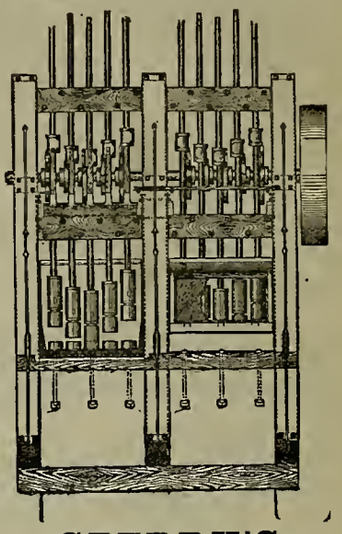

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING JUNE 8TH, 1880.

228,609.—ORE FEEDER—E. Colman, S. F.
228,515.—BALING PRESS—J. Cook, Healdsburg, Cal.
228,629.—WATER WHEEL—W. Hacheny, S. F.
228,550.—RAILWAY SIGNAL—D. & T. Morris, S. F.
228,560.—FIREARM—A. Schneider, S. F.
228,563.—BUTTON—E. Sbric, S. F.
228,577.—TRANSMITTING CHROMATIC MOTION—H. J. Wenzell, S. F.

FOR THE WEEK ENDING JUNE 15TH, 1880.

228,850.—BELT TIGHTENER—J. H. Allen, Sacramento, Cal.
228,813.—PLOW.—J. Hafner, Springville, Cal.
228,894.—UMBRELLA.—D. Harris, S. F.
228,898.—COMPOUND—G. Holland, S. F.
228,908.—VELOCIPEDE—F. Langmaak and P. Streiff, S. F.
228,932.—SWITCH—J. W. C. Rhind, S. F.
228,781.—TRUCK FRAME—J. Roemer, Portland, Ogn.
228,845.—ROWING MACHINE—J. F. Walthour, S. F.
228,881.—LIME JUICE—J. & T. D. Douglas, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

AUTOMATIC SWITCH FOR WIRE-ROPE RAILROADS.—James W. C. Rhind, S. F. Patented June 15, 1880. No. 228,932. The object of this invention is to provide an automatic switching apparatus for that claes of railroads known as "wire-rope" railroads, where the power of propulsion is imparted by means of an endless rope. In the cable or wire-rope railroads the endless rope runs down the center of one line of track and up the center of the other under the surface of the street in a suitable tube, power being applied to the rope by engines at any convenient point. A dummy or small car coupled to the passenger car is provided with a grip. This grip projects down below the level of the roadway at all times, and the dummy on which it is placed precedes the car. At the end of the line it is necessary for the car to be passed ahead of the dummy, and the car must therefore be switched off to the other track first, and the dummy follow it, so as to come in front on the return trip. The way in which this is done at present is that just before reaching the switch the car and dummy are disengaged, and the dummy passes on a short distance ahead over the closed switch point. As soon as it passes an attendant shifts the switch, which turns the following passenger car off onto the up-track, and it runs on down to the end of the line, the dummy having meantime been stopped. The dummy with its grip drawn up clear of the endless cable, then crosses over by a curved track or another switch and comes in behind the car so as to be ahead of it in starting up again. The switch over which the paseenger car goes must be closed to allow the dummy first to pass down the line, and then opened to allow the car to come over to the other track. The present invention consists in providing a movable switch, which is so connected by euitable levers under the level of the track, that the said levere may be automatically moved at the proper time by means of the downward projecting grips, so as to open and close said switch at the proper time for both dummy and car.

VELOCIPEDE.—F. Langmaak and Peter Streiff, S. F. Patented June 15, 1880. No. 228,908. This invention consists in placing within the open hub of a single wheel, a carriage provided with driving and guide wheels moving in an annular groove inside the hub, this carriage being provided with a saddle upon which the rider sits astride, combined with operating foot-levers, which, hy means of cords, rotate alternately clutches on the shaft of the central driving-wheel of the carriage. These clutches are so arranged that they engage with the driving-shaft on the forward motion, but release it when the foot is drawn hack for the return stroke. By having a pair of the levers an alternate motion is kept up and a continuous revolution of the driving-wheel maintained. A velocipede of this form will not he as difficult to ride as those where the rider has to sit in a saddle over the wheel, owing to the weight being helow instead of above the center of gravity.

OVERALLS.—Samuel R. Krouse, S. F. Patented May 25, 1880. No.227,981. This invention relates to certain improvements in the manufacture of overalls and that clase of garmeuts intended for outside wear; and it coneists in an improved construction and application of strengthening-strips, stays, and re-enforce pieces hy which the body of the fabric, pocket corners and seams are strengthened, the parts are unitsd to form a more complete mutual band or support, while from their form a considerable economy of material is effected in the cutting of these parts.

BELT-TIGHTENING ATTACHMENT FOR SEWING MACHINES.—Joseph H. Allen, Sacramento, Cal. Patented, June 15, 1880. No. 228,850. This invention consists in providing a swiveled adjustahle arm carrying an adjustable extension with a friction-roller, by means of which the pressure on the belt, and the angle of said pressure may be regulated at will. The device is so simple that it is readily changed, so as to be adjusted for light or heavy work.

PREPARATION OF LIME-JUICE.—John and Thomas D. Douglas, S. F. This invention relates to a compound which is intended for making lemonade, seasoning etc., to take the place of limes. The compound is useful for making lemonade, being designed to take the place of limes or lemons. It is agreeable to the taste, will not decompose with age, and is always ready for use. It is put up in bottles of convenient size, and has the appearance of ordinary lime-juice.

News in Brief.

THERE are 150 prisoners in the Nevada State Prison.

THERE are nearly 20,000 Roman Catholics in Japan.

THE ascertained population of Salt Lake City is 20,757.

THE hours of labor are much longer in France than in England.

GREEK pirates have sacked the town of Alkiel, Asia Minor.

THE cattle plague has been raging in and around Shanghai, China.

THE seventeen-year locust has made its appearance in eome parts of Ohio.

A MENDOCINO county hunter mistook Roland Nunn for a deer and shot him dead.

WORK on the Canada Pacific railway, British Columbia, is being pushed vigoronsly.

THE brickmakers' strike at Denver, Col., is over, and all the yards are again in full blast.

No less than 30 pearl-divers in the Persian gulf fell victims to the sharks during the last year.

THE Spaniards have bought two light draft schooners, at Baltimore, for watching the Cuban coast.

CONSIDERABLE trading in smuggled goods by British Columbia Indians ie reported from Alaska.

NEW ORLEANS has shipped to France and Italy within a year 2,400,000 gallons of cotton seed oil.

THE fruit crop on the islands in tbe lower Sacramento will hardly be up to the average this year.

GENERAL ROCA, late Minister of War, has been elected President of the Argentine Confederation.

A FRENCH engineer, M. Falles, proposes to provide all the great arteries of Paris with elevated railways.

A TRAMP threw himself in front of a train near Dunnigan, Yolo county, June 19th, and was instantly killed.

A DISH-WASHING machine has been invented that is eaid to be able to take the place of a servant girl at that business.

IN the District of Lauban, near Breslau, Prussia, June 21st, a rain tornado killed 56 persons aud destroyed 105 houses.

AN unknown man was run over by a train near Williams, Yolo couuty, June 21st, and both his feet were cut off.

AN African Committee has recently been formed at Naples to promote the exploration of East Central Africa by Italians.

THE new iron bridge across the Golden Horn ie 1,600 ft. long and its width is 48 ft. It has a central opening for shipping of 170 ft.

IN the opinion of the *Saturday Review* the diplomacy of the United States is always aggressive and pugnacious, if not litigious.

A CHURCH bell fell from its supports in a steeple at Yountville, Napa county, on Sunday, June 20th, and crushed through to the ground.

THE first delivery of letters in London does not take place until between half-past eight and a quarter to nine o'clock in the morning.

A LONDON dispatch from Berlin June 20th, states that 63 persons were killed during the late terrible storm and water spout near Dreeden.

THE prospects of the Ceylon coffee crop are unfavorahle, and the government yield of Java will probably be 30,000 tons below that of 1879.

AN experimental shipment of fifty harrels of Spitzenherg and Rhode Island Greening apples was lately made from San Francisco to China.

CHARGES of cruelty, immorality and harsh treatment against the managers of the Ohio Lunatic Asylum are being investigated in Columhus.

AN explanation is to be demanded from the Spanish Government in regard to the recent firing upon an American schooner by a Spanish war vessel.

BRET HARTE delivered a lecture to a distinguished, numerous and enthusiastic audience, in London on June 21st, on the subject of "The Argonauts of '49."

DR. JOKHELES, surgeon of the Third Don regiment, who was recently buried with military honors, is said to have been the first Russian Jew thus honored.

LORD RIPON contemplates raising the moral tone of the Viceregal Court in India. In no caee will he kiss the ladies who honor hie Court with their presence.

Pocket Mining Atlas,

Containing the principal mining districts in the United States. Complied from the latest official surveys and the most authentic sources by Edwin Bolitho. Sent, post-paid, on receipt of $1. Address, Dewey & Co., 202 Sansome St., S. F.

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Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct (or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omissions of agents.

SAN FRANCISCO, May 25, 1880.

MESSRS. DEWEY & CO.—GENTLEMEN:—In acknowledging receipt of my two patents, I desire to express my thanks for the prompt attention which my business has received. The successful manner in which you have conducted the same shows a marked ability as Patent Agents, and I shall take pleasure in recommending your firm to all who desire to obtain patents. I have received copies of the MINING AND SCIENTIFIC PRESS containing descriptions of my inventions. With the best of wishes, I remain.

Yours truly, LOUIS BEGON.

By Universal Accord,

AYER'S CATHARTIC PILLS are the best of all purgatives for family use. They are the product of long, laborious and successful chemical investigation, and their extensive use, by physicians in their practice, and by all civilized nations, proves them the best and most effectual purgative Pill that medical science can devise. Being purely vegetable, no harm can arise from their use. In intrinsic value and curative powers no other Pills can be compared with them, and every person, knowing their virtues, will employ them, when needed. They keep the system in perfect order, and maintain in healthy action the whole machinery of life. Mild, searching and effectual, they are specially adapted to the needs of the digestive apparatus, derangements of which they prevent and cure, if timely taken. They are the best and safest physic to employ for children and weakened constitutions, where a mild but effectual cathartic is required.

FOR SALE BY ALL DEALERS.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Chew JACKSON'S BEST Sweet Navy Tobacco.

Mining and Other Companies.

Persone interested in incorporated sharee will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the eame.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company,

Nevada Block, Room 37, S. F., June 15, 1880.

At a meeting of the Board of Directors of the above named Company, held this day, Dividend (No. 56) of Fifty cents (50c.) per share was declared, payahle on SATURDAY, June 19, 1880. Transfer hooks closed until Monday, 21st.

W. W. TRAYLOR,
Secretary.

DIVIDEND NOTICE.

Office of the Spaulding Gold and Silver Mining Company—A Stock Dividend has this day heen declared, payable to the Stockholders of this Company, on and after the 10th day of June, of three shares of the Republic Mining Company's stock for each five shares of this Company's stock, on presentation of the certificates of stock of this Company.

JOHN HEIN, Secretary.

Office—117 Battery street, San Francisco, Cal.
Saturday, May 29, 1880.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 42), levied on the Fifth day of May, 1880, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. Shares.	Amt.
Bracket, Franklin B.....	189	100	20 00
Bracket, Franklin B.....	190	100	20 00
Bracket, Franklin B.....	191	100	20 00
Bracket, Franklin B.....	192	75	15 00
Butterfield, Enoch.....	193	150	30 00
Barhour, Harry N.....	178	100	20 00
Beehe, A O, Trustee.....	297	100	20 00
Beehe, A O, Trustee.....	298	100	20 00
Beehe, A O, Trustee.....	299	100	20 00
Beehe, A O, Trustee.....	300	100	20 00
Beehe, A O, Trustee.....	301	100	20 00
Beehe, A O, Trustee.....	302	100	20 00
Beehe, A O, Trustee.....	303	100	20 00
Beehe, A O, Trustee.....	304	100	20 00
Beehe, A O, Trustee.....	305	100	20 00
Beehe, A O, Trustee.....	306	100	20 00
Beehe, A O, Trustee.....	307	100	20 00
Beehe, A O, Trustee.....	308	100	20 00
Beebe, A O, Trustee.....	309	100	20 00
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Beebe, A O, Trustee.....	326	100	20 00
Beebe, A O, Trustee.....	327	100	20 00
Beebe, A O, Trustee.....	328	100	20 00
Beebe, A O, Trustee.....	329	110	20 00
Beebe, A O, Trustee.....	330	100	20 00
Beebe, A O, Trustee.....	331	100	20 00
Call, Jonas.....	32	2000	400 00
Call, Jonas.....	33	1000	200 00
Chapman, C C, Trustee...	210	500	100 00
Chapman, C C, Trustee...	211	500	100 00
Chapman, C C, Trustee...	212	500	100 00
Chapman, C C, Trustee...	213	500	100 00
Chapman, C C, Trustee...	214	375	75 00
Day, Wm H.....	334	50	10 00
Day, Wilbur F.....	259	100	20 00
Day, Wilbur F.....	260	110	22 00
Day, Wilbur F.....	261	50	10 00
Day, Wilbur F.....	262	50	10 00
Ellis, H C.....	296	250	50 00
Grant, Peter.....	330	775	155 00
Goodrich, S S.....	142	50	10 00
Goodrich, S S.....	143	50	10 00
Goodrich, S S.....	144	50	10 00
Goodrich, S S.....	145	50	10 00
Goodrich, S S.....	146	50	10 00
Goodrich, Geo B.....	179	50	10 00
Goodrich, Geo B.....	180	50	10 00
Goodrich, Geo B.....	181	50	10 00
Goodrich, Geo B.....	182	50	10 00
Goodrich, Geo B.....	183	50	10 00
Hawes, Forest G.....	165	100	20 00
Hawes, Forest G.....	166	100	20 00
Hawes, Forest G.....	167	50	10 00
Jenks, Levi.....	31	500	100 00
Jewett, Thomas A.....	102	50	10 00
Jewett, Thomas A.....	103	50	10 00
Jewett, Thomas A.....	104	50	10 00
Jewett, Harriet A.....	105	50	10 00
Jewett, Harriet A.....	106	100	20 00
Jewett, Harriet A.....	107	25	5 00
Jordan, Geo E.....	160	100	20 00
Jordan, Geo E.....	161	100	20 00
Jordan, Geo E.....	162	100	20 00
Jordan, Geo E.....	163	100	20 00
Jordan, Geo E.....	164	100	20 00
Jordan, Geo E.....	175	100	20 00
Jordan, Geo E.....	176	150	30 00
Jewett Arthur.....	332	475	95 00
Lewis, Weston, Trustee...	93	250	50 00
Lewis, Weston, Trustee...	94	100	20 00
Lewis, Weston, Trustee...	05	50	10 00
Lewis, Weston, Trustee...	96	50	10 00
Lewis, Weston, Trustee...	97	50	10 00
Maxcy, Louisa.....	119	100	20 00
Maxcy, S N.....	194	500	100 00
Maxcy, S N.....	195	500	100 00
Maxcy, S N.....	196	100	20 00
Maxcy, S N.....	197	100	20 00
Maxcy, S N.....	198	200	40 00
Maxcy, S N.....	199	250	50 00
Maxcy, R S.....	170	500	100 00
Maxcy, R S.....	171	500	100 00
Maxcy, R S.....	172	500	100 00
Maxcy, R S.....	173	300	60 00
Maxcy, R S.....	174	200	40 00
McAffee, Wm.....	200	500	100 00
McAffee, Wm.....	201	500	100 00
McAffee, Wm.....	202	190	38 00
Norton, Chapman & Co...	344	100	20 00
Norton, Chapman & Co...	345	100	20 00
Norton, Chapman & Co...	346	90	18 00
Norton, Chapman & Co...	347	100	20 00
Norton, Chapman & Co...	348	100	20 00
Norton, Chapman & Co...	349	100	20 00
Norton, Chapman & Co...	350	100	20 00
Norton, Chapman & Co...	351	100	20 00
Norton, Chapman & Co...	352	100	20 00
Norton, Chapman & Co...	353	100	20 00
Norton, Chapman & Co...	354	20	4 00
Plaisted, Nancy M.....	147	125	25 00
Prehle, Edward E.....	225	225	45 00
Stevens, Mrs H A.....	77	100	20 00
Stevens, Mrs H A.....	78	100	20 00
Stevens, Mrs H A.....	79	50	10 00
Stone, W W.....	159	200	40 00
Skinner, Maria.....	334	250	50 00
Wood, Ray T.....	148	100	20 00
Wood, Ray T.....	149	100	20 00
Wood, Ray T.....	150	100	20 00
Wood, Ray T.....	151	100	20 00
Wood, Ray T.....	152	100	20 00

Also, 403 shares of the old issue, equal to 2040 shares of the new issue of the capital stock of the said Gover Mining and Milling Company.

Name	No. of Certificate.	No. of Old Shares.	No. of New Shares.	Amt
Cook, L D.....	210	10	50	10 00
Cook, L D.....	871	5	25	5 00
Goding, E L.....	254	25	125	25 00
Goding, E L.....	741	13	65	13 00
Grant, Peter.....	894	18	90	18 00
Grant, Peter.....	915	25	125	25 00
Grant, Peter.....	917	5	25	5 00
Goding, E.....	143	50	250	50 00
Goding, Ephraim...	739	20	100	20 00
Goding, Mrs E.....	740	12	60	12 00
Gorrie, Thomas.....	682	10	50	10 00
Hayes, R T.....	31	10	50	10 00
Mitchell, J L.....	150	10	50	10 00
Mitchell, J L.....	172	10	50	10 00
Mitchell, J L.....	372	5	25	5 00
Mitchell, J L.....	405	5	25	5 00
Mitchell, J L.....	766	10	50	10 00
Rogers, Geo L.....	152	20	100	20 00
Wallace, Jas H.....	365	25	125	25 00
Wallace, Jas H.....	366	25	125	24 00

ALD in accordance with law and an order of the Board of Directors made on the fifth day of May, 1880, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Wednesday, the fourteenth day of July, 1880, at the hour of one o'clock P. M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

W. O. WILSON, Secretary.

Office—No. 402 Front street, room 8, San Francisco California.

Some fine sunny offices (next to the PRESS office), to rent (at very reasonable rates), by Dewey & Co., at 202 Sansome street, corner of Pine.

A CARD.

ELEVATOR ACCIDENTS.

On January 1st, 1880, the Cage of an Elevator built by me in Robert Sherwood's Union Block, and in the store occupied by Albert Mau & Co., fell and injured three persons who were upon it at the time. This is the first and last instance in which any person has ever been injured by any of my Elevators, and this would not have happened had not the machinery in the basement been tampered with, and the nuts changed on the end of the piston rod.

The Safety Arrangements on the majority of the Elevator Cages, as well as on those previously erected by me, will only act and prevent the cage from falling when the cage rope breaks. Should the machinery below give way, as was the case at Albert Mau & Co.'s and Bauer, Tobriner & Co.'s, the Cage must inevitably fall, with results probably more serious than the accident mentioned. Since then I have spent a great deal of time, study, labor and money to invent some positive safety, which I have at last succeeded in doing. I now place it before the public with the following merits:

I claim that it is light, simple, noiseless, durable and positively an absolute safety. They can be seen in operation at A. B. McCREERY'S BUILDING, 310 Pine St.; ROBERT SHERWOOD'S UNION BLOCK, corner Market and Davis; CYCLOPS MACHINE WORKS, 115 and 117 Beale St.; J. C. JOHNSON & CO., 12 Pine St.; SROUFE & McCRUM, Union Block; ALBERT MAU & CO (2), Union Block; LANGLEY & MICHAELS, Pine and Front; KEANE BROS., 107 Kearny St.; B. NATHAN & CO., 126 Sutter St.; ROSENBAUM & CO., 22 Battery St.; NEUSTADTER BROS., Pine and Battery; F. TOPLITZ & CO., 571 Market St; BAUER, TOBRINER & CO., 547 Market St.; HIBERNIA BANK BUILDING, Montgomery and Market; FECHEIMER, GOODKIND & CO., 18 Sansome St.; A. B. ELFELT & CO., 108 Sansome St.; ACADEMY BUILDING, 330 Pine St; L. DINKLESPIEL & CO., Battery and Pine. The price each for them complete and attached to a Passenger Car, is One Hundred and Twenty five dollars ($125); attached to a Store Cage, complete, One Hundred dollars.

Yours very truly,
PHILIP HINKLE,
116 & 118 Main Street.

We, the undersigned, Engineers and Mechanics, have made an examination of Philip Hinkle's Patent Safety Catch for Elevators, and find it to be light, simple, cheap, noiseless, durable, and a positive safety.

JOHN CLOT, Reliance Machine Works.
TAIT & HAINQUE, Cyclops Machine Works.
THOMPSON & EVANS, Machine Works.
GOSS & ADAMS, Machine Works.
I. V. SCHOLFIELD, Engineer Union Block.
S. DINSMORE, Supt. Machine Works, W. T. Garratt.
PENDERGAST, SMITH & CO., Ætna Iron Works.
JOHN NUTTAL, Foreman Ætna Iron Works.
J. B. JARDINE, Atlas Iron Works.
S. H. WHEELER, Fulton Iron Works.
PRESCOTT, SCOTT & CO., Union Iron Works.
SAVAGE & SON, Empire Foundry.
WM. DEACON, Main Street Iron Works.
San Francisco, May 26, 1880.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

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FOR YOUNG LADIES AND CHILDREN.
No. 1036 Valencia St., S. F.

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M. B. COCHRANE, Principal.

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Parties wanting Mining Machinery should see this Arastra before purchasing. It is practical and cheap, and gives entire satisfaction. Several are in successful operation, and others are building for Arizona and elsewhere. Send for circular to
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— FOR —

YOUNG LADIES,

1825 Telegraph Avenue, Oakland, California.

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MISS H. N. FIELD, Principal.

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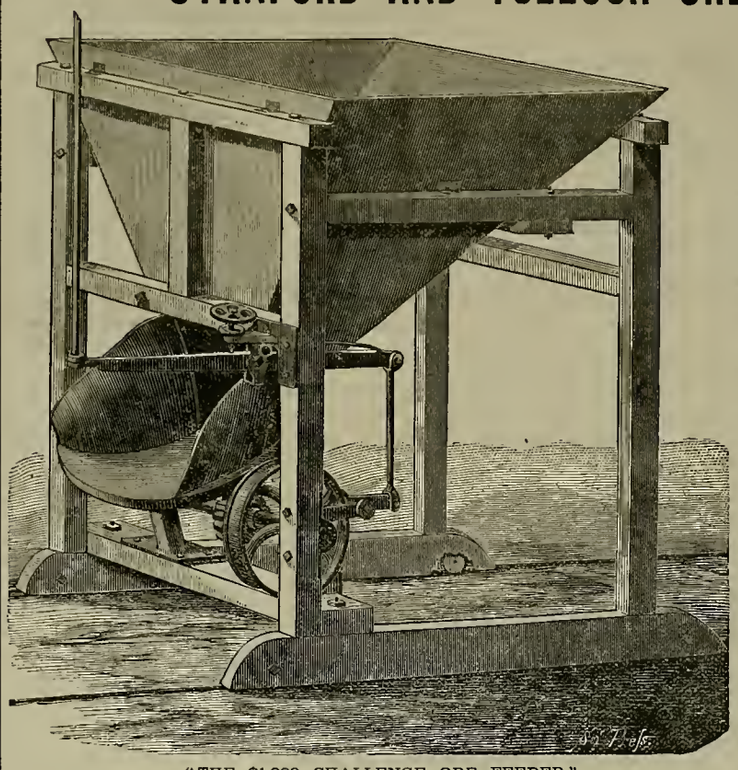
The $1,000 Challenge Ore Feeder

AT REDUCED RATES.

— ALSO THE —

STANFORD AND TULLOCH ORE FEEDERS.



"THE $1,000 CHALLENGE ORE FEEDER."

Several Hundred of the Famoue

CHALLENGE ORE FEEDERS,

Are in use in many mills on this coast, and wherever used give great satisfaction.

The STANFORD Feeder, made by me, has superseded the Victor Ore Feeders, furnished by E. T. Steen, in the Alexander mill, J. B. Cooper, President, office, Safe Deposit Building, S. F. By special permission I am enabled to refer interested parties to Mr Cooper.

In this connection I will state that I will give $50 to be shown up to this date one of the Eclipse Ore Feeders, manufactured by Prescott, Scott & Co., of the Union Iron Works, which is in general successful practical operation at any quartz mill on this coast.

I have made a specialty of manufacturing ORE FEEDERS, and know which will give satisfaction for steady work. The Improved

STANFORD FEEDER

Will beat any one in use—always excepting the CHALLENGE, which is THE BEST OF ALL.

By use of CHALLENGE ORE FEEDER there is 15 per cent. less wear and tear of iron than by hand feeding. There is also 20 per cent. more ore crushed.

I make at my works

The Challenge

AND THE

HENDY ROCK BREAKERS.

The CHALLENGE is the best rock breaker at work today. The HENDY is the newest thing in this line, and is worthy of close examination by all mill men. Call and see it.

JOSHUA HENDY,

Manufacturer of Hendy's Concentrator, Automatic Ore Feeders, Mining and Saw Mill Machinery, Etc.

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DUNHAM, CARRIGAN & CO.,

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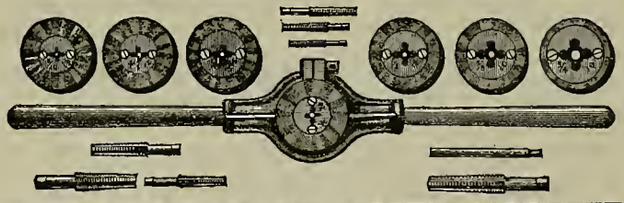
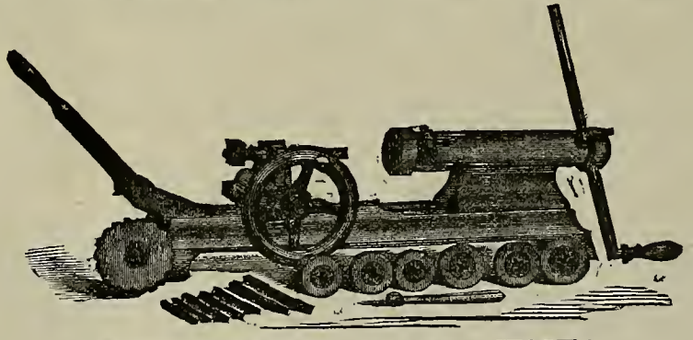


WITH TAPS, DIES AND COLLETS COMPLETE.

B, Stock 23 inches long, 7 Taps and Dies Cuts ¼ to ⅜ inch.
C, " 26 " " 7 " " " " ⅜ to 1 "
D, " 53 " " 6 " " " " ⅝ to 1½ "

No. 0. Lightning Hand Bolt Cutters and Tappers.



ESPECIALLY FOR CROOKED WORK!

Made to be bolted to the Bench or Table. Fitted with seven sizes, from ¼ to ⅝ inch. Usual assortment, ¼, 5-16, ⅜, 7-16, ½, ⅝, ¾ inch.

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BRASS CASTINGS of all kinds,
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FIRE HYDRANTS,
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GARDEN HYDRANTS

General Assortment of Engineers' Findings

Hooker's Patent Celebrated

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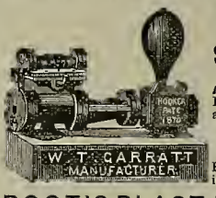

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For Ventilating Mines and for Smelting Works.

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Marine, Stationary and Portable Boilers, Smoke Stacks Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

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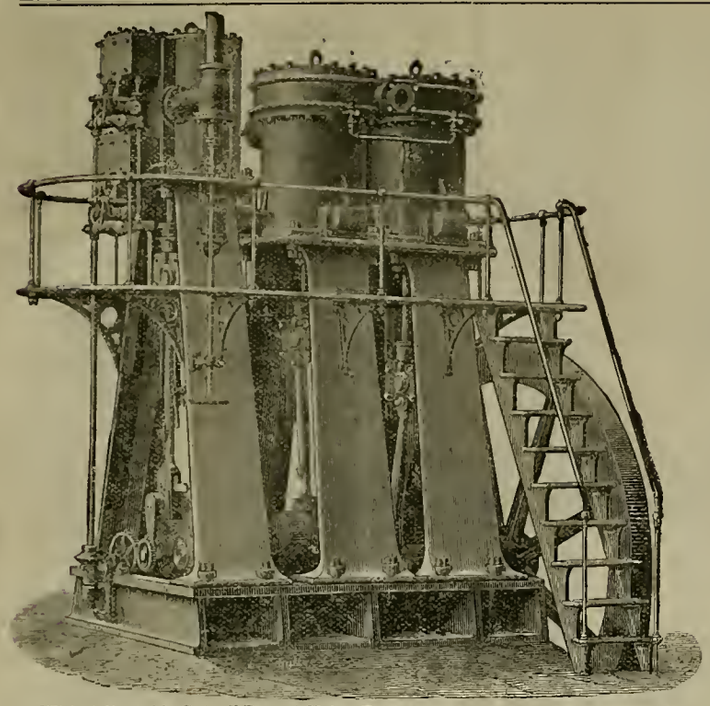

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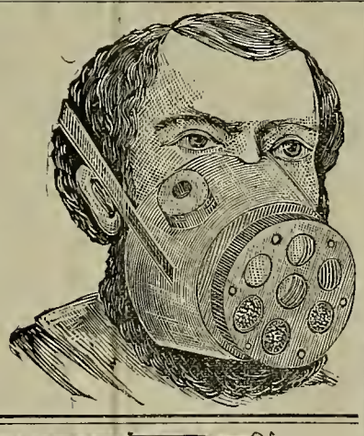

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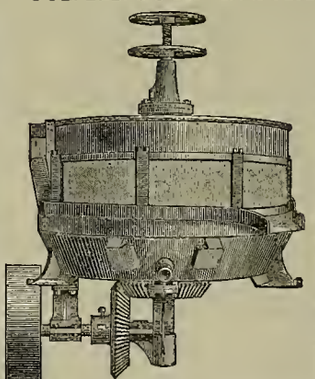

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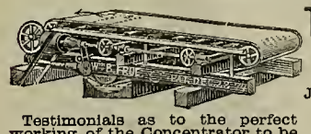

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